
SECTION 83D

REQUEST FOR PROPOSAL APPLICATION FORM

APPLICANT INFORMATION

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GRIDAMERICA GSPL – RES CANADA
WIND PORTFOLIO CAT II BID

Renewable Energy Systems Canada Inc. – PUBLIC VERSION

SECTION 1 OF APPENDIX B TO THE RFP CERTIFICATION, PROJECT AND PRICING DATA

The Certification, Project and Pricing Data (CPPD) has been provided by the Clean Energy Generation Bidder, Renewable Energy Systems Canada Inc. (“RES Canada”).

RES Canada

RES Canada is the sponsor of two (2) of the wind energy generation projects, the Mistissini Project and the Vauban Project, associated with this proposal. RES Canada has provided information and documentation supporting the portion of this bid related to these two generation projects and will refer to them collectively as the “RES Canada Wind Portfolio”. RES Canada has provided an executed Proposal Certification Form, power generation profiles, and pricing information for the RES Canada Wind Portfolio of projects as part of a completed CPPD form in:

- *Attachment 1.1 – RES Canada Wind Portfolio Category II CPPD Form* [redacted];
- *Attachment 1.2 – RES Canada Certification and Authorization Form*

GridAmerica

GridAmerica Holdings, Inc. (GridAmerica) is the sponsor of the Granite State Power Link (GSPL) transmission project, included with the proposal and has provided the information and documentation supporting the portion of the bid related to the Transmission Project. Included in Section 1 as *Attachment 1.3 – GridAmerica Certification and Authorization Form* is a Proposal Certification Form executed by GridAmerica in regards to the transmission proposal and the supporting documentation.

SECTION 2 OF APPENDIX B TO THE RFP EXECUTIVE SUMMARY OF THE PROPOSAL (INCLUDING THE BASE PROPOSAL AND ANY ALTERNATIVE PROPOSALS)

The bidder is required to provide an executive summary of the project proposal that includes a complete description of the proposed generation and/or transmission bid, the proposed contract term and pricing schedule, and other factors the bidder deems to be important.

GridAmerica GSPL - RES Wind Portfolio Cat II Bid

Executive Summary

Introduction

As per the cover letter attached to this Proposal, also included as *Attachment 2.1 – Bid Proposal Cover Letter*, the following proposal to develop a transmission project as part of a packaged bid with Clean Energy Generation is presented by RES Canada, in collaboration with GridAmerica, and is submitted pursuant to Section 2.2.1.3 ii of the RFP. The project proposal comprises the Granite State Power Link transmission system developed by GridAmerica, and two new Class I RPS wind energy generation facilities developed by RES Canada.

Granite State Power Link Overview

The Granite State Power Link project (GSPL Project) is a proposed HVDC transmission system that will interconnect the electrically separate, low cost energy system of Quebec to the New England electric system (ISO-NE). By enabling delivery of new-build wind, the GSPL Project provides an economic and environmentally efficient way for Massachusetts to meet its greenhouse gas reduction goals. As an enhanced interconnection between New England and Canada, the GSPL Project will increase economic transfers of energy between Quebec and ISO-NE for the benefit of the ratepayers of the Commonwealth.

Specifically, the GSPL Project will be comprised of a 400kV, 1.2GW Voltage Source Converter (VSC) symmetrical monopole HVDC link connecting the Canadian transmission system to the U.S. transmission system. GridAmerica Holdings Inc. (GridAmerica) has developed a solution that requires two new HVDC converter stations, one near the Canadian border in Norton, Vermont and the other in Monroe, New Hampshire, connected by approximately 58 miles of HVDC overhead line co-located with the Phase I HVDC line in an expanded right-of-way (ROW). GridAmerica's innovative solution will require system reinforcement and upgrades to facilitate bulk power transfer. GridAmerica has applied for connections with Hydro-Québec TransÉnergie (HQT) in Quebec, and with New England Power Company (NEP) in New England.

The GSPL Project has conducted extensive modelling of upgrades in the U.S. using an independent engineering expert. The interconnection of the GSPL Project to the ISO-NE bulk power system is anticipated to require a number of New England AC System Upgrades, including upgrading two NEP-owned 230kV AC lines to 345kV AC running 108 miles from Monroe, New Hampshire to Londonderry, New Hampshire and associated substation works (see Figure 2.1). GridAmerica has requested long-term firm point-to-point transmission service over the HQT bulk power system to the international border near Norton, Vermont, and this is expected to trigger upgrades to the

transmission system in Quebec. GridAmerica will continue to explore connection options in Quebec for the overall benefit of the project, but have responded to this RFP with a solution that requires a new HVAC line from the HQT bulk power system down the Phase I ROW to the international border.

GSPL Project Developers

The GSPL Project's lead developer is GridAmerica, a direct wholly-owned unregulated subsidiary of National Grid USA (National Grid USA and its subsidiaries, collectively, National Grid). National Grid and its affiliates are world leaders in HVDC transmission development, construction and operation with numerous projects in operation or under development by National Grid in the United States and by its affiliates in Europe. National Grid also has a long record of accomplishment building large-scale electrical transmission infrastructure in New England, and through its affiliates, in the United Kingdom.

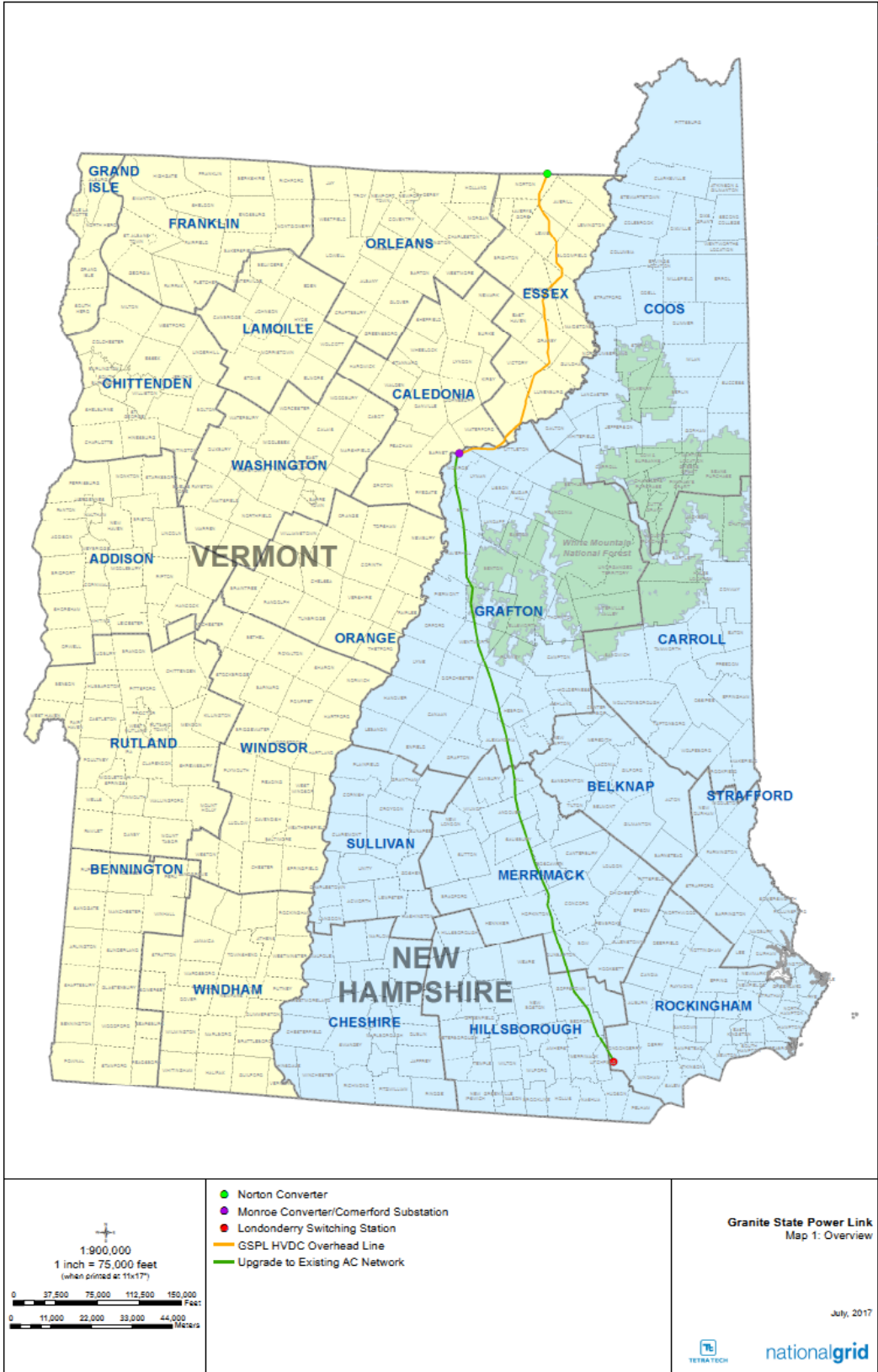


Figure 2.1. GSPL Project Corridor and Route of Associated AC Upgrades

GridAmerica is proud to have Citizens Energy Corporation (Citizens Energy) as a co-investor in the GSPL Project. Citizens Energy partners with utilities across the country to develop new large-scale energy projects in high-voltage transmission and solar generation. Citizens Energy, a non-profit company, uses the proceeds from such investments to support funding of charitable programs for disadvantaged people living in the area. Citizens Energy has committed 50% of the proceeds of its investment in the GSPL Project to assist low-income families with their energy needs.

GridAmerica also intends to partner with Vermont Electric Power Company (VELCO), in the development of the HVDC line in Vermont. VELCO manages the safe, reliable, cost-effective transmission of electrical energy throughout Vermont to meet both current and future energy needs of the state where it has an extensive and successful track record with large-scale transmission projects and a strong brand. Naturally, VELCO has a strong interest in the GSPL Project due in large part to the proposed route, which seeks to co-locate a mirrored set of transmission assets adjacent to VELCO's transmission line in the Northeast Kingdom of Vermont.

What Makes the GSPL Project Unique?

The GSPL Project is unique among the likely transmission offerings because it aligns environmental and consumer interests in a project that will enhance the Commonwealth's ability to meet its goals under the Global Warming Solutions Act. GridAmerica's innovative approach to the GSPL Project maximizes the use of existing ROWs to provide efficient access to some of the lowest cost clean energy within reach of New England. The GSPL Project is superior to other alternatives for providing transmission access to the same geographic area because it will not require the siting and construction of newer infrastructure, it will be significantly less expensive, it will mitigate adverse impacts on the environment, and it will deliver an optimal mix of new-build generation, delivering greater incremental emission reductions than contracting with existing generation, making the GSPL Project the best alternative to access Quebec clean energy resources.

The GSPL Project's co-location with the existing Phase I HVDC line on an expanded ROW avoids the viewshed and environmental impact associated with new transmission corridors. The AC System Upgrades required by the GSPL Project's interconnection in New England primarily involves a voltage upgrade to two NEP-owned circuits, which will require almost no increase in ROW and replacement of only an estimated 20% of the existing towers.

The GSPL Project's all-wind 100% REC-qualified contract profile makes it unique among likely large scale bids to the RFP. The GSPL Project will unlock Quebec's tremendous wind power potential by enabling 1200 MW of development-phase projects to reach commercial operation and cost-effectively meet Massachusetts' environmental goals for the benefit of the Commonwealth's ratepayers. The development of new wind power maximizes emission reduction benefits compared to existing large-scale hydro projects that are already delivering power to interconnected regions and would contribute little incremental global emission reduction benefits. Therefore, procurement of delivered wind power over the GSPL Project holds the promise of achieving much more meaningful progress towards the Commonwealth's environmental goals as established in the Global Warming Solutions Act.

Partnering with local communities in the early phase of energy infrastructure development and inviting key community figures and institutions to help shape the projects is vital to project success. Because local outreach is central to GridAmerica's development philosophy, the project began a program of intense local outreach, and the reception has been positive. In New Hampshire, the GSPL Project is earning a reputation for respecting the scenic beauty of the state, resulting in letters

of support across a broad spectrum of stakeholders. The expected AC system upgrades in New Hampshire will make maximum use of existing infrastructure and ROW, garnering local, state and NGO support and contributing to timely and less contentious permitting.

GridAmerica's partnerships in Vermont, coupled with the benefits the GSPL Project offers the state (e.g., job creation, tax base and lower energy costs), will establish a compelling permitting narrative for state agencies. VELCO is widely regarded in Vermont as a trusted partner in the field of energy infrastructure development with a strong track record in protecting the environment, promoting sustainable sources of energy and delivering projects on time and within budget. The GSPL Project is also partnering in Vermont with the Northeast Vermont Development Association (NVDA), the regional planning agency for northern Vermont that assists municipalities with grant administration, as well as with a wide variety of planning and technical services. The GSPL Project and the NVDA have executed an MOU to offer community and economic development opportunities to the project host communities in the Northeast Kingdom.

Benefits of the GSPL Project Proposal

Under this Category II submission, RES Canada will supply 500.4 MW of delivered Class I Incremental Clean Energy at the GSPL Project converter in Monroe, New Hampshire. The delivered energy cost reflects RES Canada's Quebec transmission costs and proportional use of the GSPL Project capacity. GridAmerica will seek to recover the value of capacity not used by RES Canada on a merchant basis through short-term sales to generators wishing to export to the New England region. The costs of such transmission will not be assigned to customers. The recovery of such value is entirely at the risk of GridAmerica, not customers. GridAmerica expects that all merchant power will be "price takers" in the ISO-NE market and most of it will likely qualify as Clean Energy under the GWSA. Such market-priced clean energy will allow the EDCs to more quickly and cost-effectively achieve 2050 GWSA goals unmet by the 9.45 TWh procured under this solicitation, saving New England customers \$7.8 billion over 10 years (see Section 13, *Attachment 13.3 (confidential) – ESAI GSPL Report 2017*), without the risk of additional long-term contracts for qualified delivered energy. The merchant transfer capability, whose costs are entirely at risk to GridAmerica, is expected to experience a high capacity factor during the Winter Period, bringing substantial incremental security of supply benefits to the Commonwealth. With respect to energy and capacity market, customers in Massachusetts, New Hampshire, and Vermont alone will see \$4.7 billion in energy savings (see Section 13, *Attachment 13.3 (confidential) – ESAI GSPL Report 2017*). The GSPL project will enable 1,200 MW of new wind generation in Quebec. The incremental emissions reductions achieved by the production and delivery of such new power will be dramatically higher than any reductions by the re-dispatch of existing large scale resources (See *Attachment 2.1.0 – (confidential) The Superior Advantage of the GridAmerica Offering*).

RES Canada Wind Portfolio Overview

The RES Canada Wind Project Portfolio is made up of two wind generation projects – the Mistissini Project, which is a 201.6MW wind energy project located in northern Quebec, and the Vauban Project, which is a 298.8MW wind energy project located in southern Quebec, for a combined total of 500.4MW of installed generation capacity. As detailed in this proposal, these Clean Energy Generation projects would use the Quebec HQT transmission system and the GSPL Project to deliver clean, new-build, incremental wind energy to ISO-NE.

The Mistissini and Vauban projects will be modern wind energy generation facilities and consist of the latest wind turbine technology. Each of the projects will also include access roads, a medium-voltage collector system, a transforming substation, power-performance meteorological towers, and an interconnecting gentie to the HQT system. Both projects are located on public land in Quebec and both have received a Letter of Intent from the Minister of Energy and Natural Resources of Quebec that will enable the public land disposition required for their construction.

Both the Mistissini and Vauban projects are qualified to participate in this RFP based on the recent modification to Quebec's public land disposition policy, which allows Canadian wind projects on Quebec public lands to participate in energy export opportunities. RES Canada believes that this is the result of efforts by Quebec and New England policy makers to enable the sale of low-cost Quebec renewable energy to New England. Coupled with enabling and low-cost transmission developments like the GSPL Project, this has positioned Quebec to deliver its low-cost and environmentally sustainable wind energy to help meet the Commonwealth's energy and environmental objectives.

RES Canada Development

As a developer of wind energy projects, RES Canada has had unparalleled success in Quebec. As detailed in Section 11 of this bid, RES Canada has developed over 1,300MW of wind projects that have been financed and constructed in Quebec, and is currently managing the construction of the RES-developed 150MW Mont-Sainte-Marguerite project in southern Quebec. RES Canada, together with its affiliates comprise the RES Group of companies, collectively one of the world's leading renewable energy developers and constructors, with over 12 GW of renewable energy projects developed and constructed worldwide.

RES Canada's expertise includes site selection, wind resource analysis, technical design, permitting, land acquisition, engineering, financing, and construction management. In addition to its success in Quebec, RES Canada has developed and built over 500MW of wind energy generation projects in Ontario and built the 150MW Halkirk project in Alberta.

RES Canada's US affiliate, Renewable Energy Systems Americas Inc. (RES Americas), is one of the most experienced and trusted development and construction companies in the US. RES Americas has built over 8,000MW of wind, solar, and energy storage projects in North America, including over 3,500MW developed by RES. RES Canada and RES Americas work closely and in a highly integrated manner to ensure timely, safe, and on-budget completion of our projects.

The Mistissini Project

The Mistissini wind energy project (Mistissini Project) is a 201.6MW wind energy generation facility located in the James-Bay region of northern Quebec (see Figure 2.2). The project enjoys a very strong wind resource, and existing forestry roads provide natural access to the site. As detailed in Section 4, RES Canada has excellent wind resource data for the site from over ten meteorological towers, with measurements spanning over nine years, boasting strong correlation and spatial coverage.

[REDACTED]

Figure 2.2 Mistissini Project Site Location

The Mistissini Project is a mature development, with solid support from the local First Nation community, the First Nation Cree Community of Mistissini, and extensive environmental and consultation work completed to date. As detailed in Section 6, environmental fatal-flaw and constraint studies have been completed and no significant land use or natural heritage features should affect development of the project.

RES Canada is partnered with the Mistissini Cree First Nation and Citizens Energy Corporation (Citizens Energy) on this development. Citizens Energy, having been a long-standing development partner in this development, has the ability to invest in a minority ownership position in the project.

The partnership with the Mistissini Cree is also long-standing and in addition to having an option for investment in the project, their participation will greatly facilitate the land disposition and permitting process.

Including First Nations in sustainable development projects in Canada has become, in recent years, an important factor to gain social acceptability and license for utility-scale projects, especially when those projects are on First Nation traditional territory. The Mistissini Cree have been strong supporters of wind development and collaborative partners in helping RES Canada understand the nature of the lands. RES Canada is proud to have gained the trust of this important First Nation and believes that Massachusetts ratepayers would look favourably on their participation in this project.

The project site, as further detailed in Section 6, is situated on forested, Canadian-Shield topography, with extremely low housing density and limited existing land use. The site has minimal complexity, acceptable slope constraints, and its elevated areas are exposed to the predominant winds. It is located within 10-15km of an existing 161kV transmission line which has sufficient capacity to interconnect the project, as confirmed by initial interconnection studies.

RES Canada has initiated studies with HQT and has confirmed required interconnection and system upgrade costs and schedules. As detailed in the overview of the GSPL Project, GridAmerica will enter into a Long-Term, Firm, Point-to-Point Transmission Service Agreement with HQT to enable delivery of the project generation to the point of receipt of the GSPL Project which in turn will permit contractual delivery of the Clean Energy Generation to the Massachusetts Pool Transmission Facilities.

The proposed contract term for the Mistissini Project is 20 years, beginning on December 31, 2022.

The Vauban Project

The Vauban wind energy project (Vauban Project) is a 298.8MW wind energy generation facility located in the Bas-Saint-Laurent region of southern Quebec. The project enjoys a very strong wind resource, and existing local and forestry roads provide natural access to the site. As detailed in Section 4, RES Canada has excellent wind resource data for the site from over two meteorological towers, with measurements spanning over two years, boasting strong correlation.

[REDACTED]

Figure 2.3 Vauban Project Site Location

The Vauban Project is a mature development, with solid support from the local Municipal communities, including an alliance of municipalities (l'Alliance de l'Est) who have traditionally supported wind energy development and have formally indicated their support for the Vauban Project. Initial environmental and consultation work has been completed. As detailed in Section 6, environmental fatal-flaw and constraint studies have been completed and no significant land use or natural heritage features should affect its development. RES Canada expects to partner with the Alliance de l'Est on this development, which will greatly facilitate the land disposition and permitting process for the project.

The project site, as further detailed in Section 6, is situated on forested, rolling topography, with low housing density and limited existing land use. The site has minimal complexity, acceptable slope constraints, and its elevated areas are exposed to the predominant winds. It is located within 1.9 km of an existing 315kV transmission line which has sufficient capacity to interconnect the project, as confirmed by initial interconnection studies.

RES Canada has initiated studies with HQT and has confirmed required interconnection and system upgrade costs and schedules. As detailed in the overview of the GSPL Project, GridAmerica will enter into a Long-Term, Firm, Point-to-Point Transmission Service Agreement with HQT to enable delivery of the project generation to the point of receipt of the GSPL Project which in turn will permit contractual delivery of the Clean Energy Generation to the Massachusetts Pool Transmission Facilities.

The proposed contract term for the Vauban Project is 20 years, beginning on December 31, 2022.

Benefits of the RES Canada Wind Portfolio

As detailed in this proposal, the Mistissini and Vauban wind projects are well established, sound, and secure developments. Both sites capture the predictably strong Quebec wind resource and are positioned well to deliver low-cost, socially acceptable and environmentally sustainable energy to Massachusetts. As new wind energy generation facilities, their impact on greenhouse gas emissions and climate change targets are direct and tangible.

RES Canada's holistic approach to community engagement and consultation, along with its proven track record on environmental assessment, interconnection, and permitting in Quebec, will ensure a smooth and on-time completion of the developments. Social acceptability of wind energy projects in Quebec is strong, and both the Mistissini and Vauban projects have the local community partners required to guarantee success.

Massachusetts and its distribution companies have an opportunity to procure 20 years of reliable Quebec wind energy from one of the world's top renewable energy developers, via a low-impact and low-cost transmission project. RES Canada is pleased to work with GridAmerica in presenting this packaged bid including the RES Canada Wind Portfolio and the GSPL Project for consideration in this RFP.

SECTION 3 OF APPENDIX B TO THE RFP OPERATIONAL PARAMETERS

- 3.1 Maintenance Outage Requirements – Specify partial and complete planned outage requirements in weeks or days for all generation facilities and transmission facilities. Also, list the number of months required for the cycle to repeat (e.g., list time interval of minor and major overhauls, and the duration of overhauls).

GSPL Project

Recurring planned outages are not required for maintenance of the AC and DC transmission lines. All inspections and vegetation management and most maintenance and repairs (see Section 9.1) can be performed with the line energized. Planned outages would be needed only rarely for the transmission lines, and in the event is any maintenance on the HVDC line required, it would typically be conducted during a converter station planned outage.

Complete planned outages for the Granite State Power Link (GSPL Project) converter stations and the Norton AC substation will consist of one 84-hour maintenance period per year. Each maintenance period will take place over three and a half consecutive days. Hence, the annual unavailability of GSPL Project is 0.96% for required planned outages. No partial outages are necessary for these transmission facilities. Planned outages will be scheduled in accordance with ISO-NE and HQT requirements and will typically take place during the shoulder months.

RES Canada Wind Portfolio

The availability loss factors due to scheduled and unscheduled outage for the generating facilities are broken down into categories, namely turbine outage and electrical (collector system) outage. Outage of wind turbines due to scheduled and unscheduled maintenance each year is assumed to be around 4.3% and collector system electrical outage around 0.82%. Since these losses are mutually exclusive, the total number of hours subject to scheduled and unscheduled downtime each year are:

$$DowntimeHours = 8766.(1 - (1 - \eta_{turbine}).(1 - \eta_{electrical})) = 445.7Hours / Year / Turbine$$

Based on operational data it has been estimated that the split between scheduled and unscheduled downtime is 30% and 70% respectively, thus:

Annual Scheduled downtime: 133.7 Hours

Annual Unscheduled downtime: 312.0 Hours

Unscheduled downtime hours are expected to be distributed evenly by month, whereas scheduled maintenance will be predominantly during the months when wind speeds are lower. Inevitably some scheduled maintenance will be required during the remainder of the year.

Planned outages will be scheduled in accordance with ISO-NE and HQT requirements and will generally take place during the shoulder months. They will be occurring in parallel of planned maintenance of the GSPL Project and therefore the total number of hours of planned maintenance for the transmission and generating projects should be around 133.7 hours.

- 3.2 Operating Constraints – Specify all the expected operating constraints and operational restrictions for the project (i.e., limits on the number of hours a unit may be operated per year or unit of time). If the bid includes firm deliveries, list the anticipated situations and frequency of interruptions of transmission sources which would affect power deliveries.

GSPL Project

The GSPL Project will not enter into operation restrictions or curtailment agreements with ISO-NE or any transmission owner that limits the number of hours the GSPL Project can operate per year or any unit of time. With respect to scheduled outages, to minimize the time that transmission capacity is unavailable to deliver power from Quebec to New England over the GSPL Project, such outages will be coordinated to the extent possible such that the AC network, GSPL Project and generation resource maintenance activities can be performed in parallel.

GSPL Project's HVDC link will be engineered, designed, operated and maintained to have an annual availability target of 98% considering both scheduled and forced outages of the converter stations and the DC transmission line. An outage of the DC transmission line or a converter station would interrupt the full delivery of power into New England from Quebec over GSPL Project.

[REDACTED]

Considering the estimated unavailability of Quebec transmission, along with an additional factor to cover GSPL Project reductions for miscellaneous conditions, the overall annual availability of the GSPL Project to deliver firm energy from Quebec to New England is anticipated to be at least 97.5%.

RES Canada Wind Portfolio

RES Canada will not enter into operation restrictions or curtailment agreements with ISO-NE or any transmission owner that limits the number of hours they can operate per year or any unit of time. With respect to scheduled outages, to minimize the time that generating projects are unavailable to deliver power from Quebec to New England over the GSPL Project, such outages will be coordinated to the extent possible such that the AC network, GSPL Project and generation resource maintenance activities can be performed in parallel. The overall planned scheduled and unscheduled maintenance of the generating projects adds up to 5.12%. Since the planned maintenance will be coordinated in parallel with the GSPL Project maintenance, RES Canada expects the overall project annual availability to be at least 94.88%.

- 3.3 Reliability – Describe how the proposal would provide enhanced electricity reliability to Massachusetts, including its impact on transmission constraints.

GSPL, Mistissini and Vauban projects

Clean renewable energy will be delivered to New England via the GSPL Project, a new controllable HVDC transmission line, utilizing voltage source converters, connecting ISO-NE to Quebec, Canada. This additional energy resource is expected to increase the reliability to the entire ISO-NE region, including Massachusetts, by providing up to 1,200 MW of additional capacity between the Quebec and ISO-NE control areas.

According to ISO-NE, the region's dependency on natural gas-fired generation was 15% in 2000, increasing to 49% in 2015. Taken together with rising gas LDC demand, these worrying trends have created a winter season security of supply risk, particularly during polar vortex events.¹ Dependency of gas-fired generation is only expected to increase further. The GSPL Project will deliver to the region a new, large-scale source of clean, REC-qualified energy whose supply profile offers significant deliveries during critical winter periods.

[REDACTED]

The energy deliveries over both the contracted (i.e., wind power) and uncontracted merchant portions of the GSPL Project capacity will enhance the Commonwealth's winter security of supply, with such benefits over the uncontracted capacity realized without risk to ratepayers.

The HVDC VSC technology allows fully independent control of both the active and the reactive power flow within the operating range of the HVDC VSC system. The active power can be continuously controlled from zero to a full power import into ISO-NE. The active power and reactive power are controlled independently, and even at zero active power, the full range of reactive power can be utilized to support AC system voltage.

VSC stations can maintain a desired voltage level in the connected AC network. Voltage stability issues can limit power transfers in the transmission grid. If a voltage collapse were to be imminent, HVDC VSC could support and stabilize the grid with the necessary reactive power. Unlike HVDC classic converters, the HVDC VSC-based converters can operate continuously at low power including 0 MW. In this way, the HVDC VSC-based converter can operate essentially as a Static VAR Compensator to enhance AC system reliability.

The AC voltage control feature of the VSC will also help to support and dynamically stabilize the AC system voltage during transmission line and load switching events that take place over the course of system restoration after blackout events. By way of example, during the August 2003 blackout in the Northeastern U.S, the Cross Sound Cable linking Connecticut and Long Island, which uses ABB's HVDC Light VSC-based technology, provided valuable power transfer and voltage control during the restoration of Long Island. GSPL Project will have the added benefit of a black start operating mode where the the VSC converter can be operated to control voltage and frequency into a network that has no generation or synchronizing sources.

The proposed GSPL Project could also be used by ISO-NE System Operators to regulate power from Quebec under emergency conditions. The very fast ramping provided by the VSC-based technology allows operators to rapidly increase or decrease imports over the link as may be required to maintain ISO-NE system security during emergency conditions.

As described in Section 6.14, the GSPL Project's point of interconnection, the associated AC system upgrades, and corresponding electric system topology changes will increase the New England north to south thermal transmission capacity by 650 to 900 MW, as compared to pre-GSPL Project limits. Comparative transfer analysis shows that pre-GSPL Project north to south thermal limits were generally in the Deerfield to Scobie transmission corridor. Since the GSPL Project's power will

¹ ISO New England 2016 Regional Electricity Outlook; https://www.iso-ne.com/static-assets/documents/2016/03/2016_reo.pdf

primarily flow south from northern New Hampshire toward the GSPL Project's planned Londonderry 345kV substation, this avoids the limiting Deerfield to Scobie constraint and other constraints in the New Hampshire Seacoast area, providing higher overall north to south transfers post-GSPL Project.

3.4 Moderation of System Peak Load – Describe how the proposal would contribute to moderating system peak load requirements and provide the following information:

- i) Estimated average output for each summer period (June- September) from 1:00 - 6:00 pm
- ii) Estimated average output for each winter period (October-May) from 5:00 – 7:00 pm

The wind generation projects are well positioned to alleviate the System Peak Loads. The production profiles presented below in Section 4.1 and Appendix F of *Attachment 4.1.1 (confidential) – Assessment of the Energy Yield at the Mistissini Wind Farm* and *Attachment 4.1.2 (confidential) – Assessment of the Energy Yield at the Vauban Wind Farm* demonstrate that a significant portion of the production of the wind farms would occur during the peak hours as defined by NE-ISO.

Mistissini Project

- i) The estimated average output for each summer period can be found in Appendix F4 of *Attachment 4.1.1 (confidential) – Assessment of the Energy Yield at the Mistissini Wind Farm*
- ii) The estimated average output for each winter period can be found in Appendix F5 of *Attachment 4.1.1 (confidential) – Assessment of the Energy Yield at the Mistissini Wind Farm*

Vauban Project

- i) The estimated average output for each summer period can be found in Appendix F4 of *Attachment 4.1.2 (confidential) – Assessment of the Energy Yield at the Vauban Wind Farm*
- ii) The estimated average output for each winter period can be found in Appendix F5 of *Attachment 4.1.2 (confidential) – Assessment of the Energy Yield at the Vauban Wind Farm*

3.5 Development Stage of all physical aspects of the bid – Describe whether the project is in operation, in construction or in the development phase.

- (a) If in operation, when did the project achieve commercial operation
- (b) If in construction, when did construction commence and what are the projected dates for initial testing and commercial operation.

- (c) If the project is partly in one development stage and partly in another, please explain in detail the status of the project.

If the proposed project is an expansion, repowering, environmental investment or other modification of an existing Facility, please describe the project in detail, the total cost and cost on a \$/kW basis specifying the existing project and the proposed expansion, repowering or other modification. Indicate any incremental or decremental capacity.

GSPL Project

The GSPL Project is currently under development. The development activities can be generally broken down in the following categories, each of which is further described throughout the proposal.

Interconnection Studies: GridAmerica has made a valid interconnection request to ISO-NE (see Section 6.6 for details). ISO-NE is presently conducting a Feasibility Study for the project, which is expected in early August this year. Due to time constraints, ISO-NE has not yet begun a Capacity Capability (PP-10) study for the project. In its place, GridAmerica has commissioned its own study to assess the capacity deliverability capability of the project (see Section 6.7). This study assesses deliverability of capacity from the 1200 MW Granite State Power Link Elective Transmission Upgrade (ETU): ISO-NE Interconnection Request Queue Position 627, with a synchronization date of 10/01/2022 and an in-service date of 12/31/2022. This study assesses the ability to deliver capacity from the proposed GSPL Project in conformance with applicable criteria in ISO New England Planning Procedure 10 (PP10): Planning Procedure to Support the Forward Capacity Market. This study is functionally equivalent to studies that would be performed by ISO-NE for the stated purpose.

GridAmerica has also completed an independent System Impact Study (SIS) for the GSPL Project, assuming the “preferred scenario” only. The “preferred scenario” reflects the view that given current and expected EDC procurement volumes and market conditions, it is unrealistic to expect Granite State Power Link, Northern Pass, and TDI New England Clean Power Link to all proceed to construction and commercial operation. In the preferred scenario, of the three projects, only GSPL Project is assumed to advance. This study is functionally equivalent to the SIS that will be performed by ISO-NE for the purpose of obtaining NEPOOL I.3.9 approval.

GridAmerica has submitted an interconnection request for the GSPL Project with HQT as the ETU project is proposed as a new HVDC-based link between Quebec and New England. No system study results are available at the time of this proposal; however, the Quebec AC network expansion schedule and cost estimates have been included in the proposal.

Siting: GridAmerica is actively engaging stakeholders and landowners to secure easements along its preferred route. GridAmerica intends to site its entire project in Vermont and New Hampshire parallel to existing transmission lines, and intends its transmission lines and towers to be no taller than the existing facilities to minimize visual impacts. GridAmerica has had discussions with public officials at both the town and state levels, and the positive reception of the GSPL Project is documented in Section 7.4. In Vermont, the GSPL Project proposes to cross the Quebec/Vermont border in Norton, Vermont, where its first of two converter stations will be located. The HVDC transmission line then parallels existing HVDC transmission for approximately 58 miles to its

interconnection point in Monroe, New Hampshire, where the second of two converter stations is located.

Permitting: GridAmerica plans to file its Presidential Permit in Q3 2017 and plans to complete environmental surveys and field work in 2017. GridAmerica will file with the Vermont Public Utility Commission (Section 248), and the New Hampshire Siting Evaluation Committee in Q1 2018. GridAmerica's permitting activities are described in greater detail in Section 7.

Design and Engineering: GridAmerica has completed the conceptual design phase and is working toward a preliminary design for both the converter stations and the overhead HVDC transmission lines. GridAmerica anticipates completing the preliminary designs to accompany its permit applications in March 2018.

GridAmerica has worked closely with General Electric (GE) on the GSPL Project's initial HVDC converter designs and intends to work closely with GE to develop detailed technical and performance specifications along with the required supply agreements for design and manufacture of the HVDC converter equipment. The overhead HVDC line portion of the project will be offered to the competitive market to source the materials from vendors with a strong internal and project mandated quality control and quality assurance programs.

Economic Analyses: Economic development impact studies have been conducted using the Regional Economic Models, Inc. (REMI) model, and ESAI Power LLC has modeled the effects of the GSPL Project on New England's wholesale electric markets. These studies are more fully described in Sections 13.1-13.4.

Stakeholder Engagement: Engagement with host communities has been central to GridAmerica's development activities since the inception of the project, and will continue throughout the remainder of development and through construction. Section 7.4 highlights key outreach to date, and describes GridAmerica's plan for future engagement.

The outreach efforts for the GSPL Project are a closely coordinated but a separate endeavor between GridAmerica and New England Power (NEP), an affiliated company. GridAmerica has led all initial project outreach to introduce stakeholders to the proposal and garner support. GridAmerica's outreach responsibilities for permitting, siting, construction and post construction periods will be focused on the overall project impacts, easement acquisition or adjustments, the HVDC line and converter stations and those impacted communities and landowners/abutters. NEP will have a similar focus leading outreach on permitting, siting, construction and post-construction for the New Hampshire AC upgrade and switching station.

RES Canada Wind Portfolio

Interconnection Studies: RES Canada has initiated studies with the Quebec transmission system operator HQT and the Preliminary Interconnection Study finalized by HQT has confirmed required interconnection and system upgrade costs and schedules. The Pre-Project Interconnection Study Agreement will be filed with HQT at the end of July or early August 2017 and the projects will be listed in the OASIS queue position for interconnection shortly after.

Siting, Design and Engineering: The Mistissini Project is sited on Mistissini Cree First Nation territory in northern Quebec. The Vauban Project is sited on public land in the Bas-Saint-Laurent region. Project boundaries have been established following a thorough land use and constraints

analysis, coupled with the wind regime analysis. Preliminary wind turbine, civil and electrical designs have been completed.

Permitting: The Environmental Assessment Processes are planned to be launched in February 2018, with the filing of the Project Notices. RES Canada will then undertake the Environmental Impact Studies. As described further in Section 10, governmental decrees authorizing the projects are expected to be issued in 2020.

Stakeholder Engagement: The development of the Mistissini and Vauban projects was initiated several years ago, in conjunction with various other regional projects. RES Canada has thus built a strong relationship with local stakeholders, which is reflected in the support these projects receive from the Cree Nation of Mistissini and the Alliance de l'Est. RES Canada will pursue stakeholder and community outreach through a consultation process to be put in place throughout the Environmental Assessment Process and continued engagement in the communities.

SECTION 4 OF APPENDIX B TO THE RFP ENERGY RESOURCE AND DELIVERY PLAN

- 4.1 For Eligible Facilities, the bidder is required to provide an energy resource or fuel supply plan for its proposed project, including supporting documentation. The fuel supply/energy resource profile information should be consistent with the type of technology/resource option proposed and the term proposed. The information requested is organized according to the type of project or energy resource. Bidders should respond to all information requests which are relevant to the bid in a timely manner.

Wind Energy Projects

Provide a summary of all collected wind data for the proposed site. Identify when the data was collected and by whom.

Mistissini Project

A high level summary of the data used to generate the energy projections is presented in Table 2.1 of *Attachment 4.1.1 (confidential) – Assessment of the Energy Yield at the Mistissini Wind Farm*.

The detailed summary of all collected data used by RES Canada for the 56 X 3.6MW Vestas V136 Mistissini Project can be found in Appendix H of *Attachment 4.1.1 (confidential) – Assessment of the Energy Yield at the Mistissini Wind Farm*.

Vauban Project

A high level summary of the data used to generate the energy projections is presented in Table 2.1 of *Attachment 4.1.2 (confidential) – Assessment of the Energy Yield at the Vauban Wind Farm*.

The detailed summary of all collected data used by RES Canada for the 83 X 3.6MW Vestas V136 Vauban Project can be found in Appendix H of *Attachment 4.1.2 (confidential) – Assessment of the Energy Yield at the Vauban Wind Farm*.

Indicate where the data was collected and its proximity to the proposed site. Include an identification of the location and height for the anemometers that were used to arrive at an assessment of the site generation capability.

Mistissini Project

The location and identification of the meteorological masts used to collect data, their proximity to the proposed site and the height of the anemometers used by RES Canada for the 56 X 3.6MW Vestas V136 Mistissini Project can be found in Section 2.0 of *Attachment 4.1.2 (confidential) – Assessment of the Energy Yield at the Vauban Wind Farm*.

Vauban Project

The location and identification of the meteorological masts used to collect data, their proximity to the proposed site and the height of the anemometers used by RES Canada for the 83 X 3.6MW Vestas V136 Vauban Project can be found in Section 2.0 of *Attachment 4.1.2 (confidential) – Assessment of the Energy Yield at the Vauban Wind Farm*.

Provide (a) at least one year of hourly wind resource data, and (b) a wind resource assessment report from a qualified unaffiliated third-party wind resource assessment firm. Include an analysis of the available wind data which addresses the relationship between wind conditions and electrical output. Provide a projection of net annual energy production, including projections of average net hourly energy production, based on the wind resource data (a 12 x 24 energy projection) at both P50 and P90 levels.

RES Canada Wind Portfolio

DNV-GL has been selected as a third party firm to provide one year of hourly wind resource data, a resource assessment report as well as the average net hourly energy production (12X24) at P50 and P90 levels. The one year of hourly wind resource data produced by DNV-GL can be found in the EXCEL template in *Attachment 4.1.3 (confidential) – DNV Mistissini 1 year of Hourly Resource Data* and *Attachment 4.1.4 (confidential) – DNV Vauban 1 year of Hourly Resource Data*. The independent third party report presenting the relationship between wind conditions and electrical output as well as an analysis of the available wind data is provided in *Attachment 4.1.5 (confidential) – DNV Mistissini Independent Energy Report* and *Attachment 4.1.6 (confidential) – DNV Vauban Independent Energy Report*. Finally, the net hour energy production in 12X24 format at P50 levels and at P90 levels can be found in EXCEL format in *Attachment 4.1.7 (confidential) – DNV Mistissini 12X24 P50-P90* and *Attachment 4.1.8 (confidential) – DNV Vauban 12X24 P50- P90*.

Provide a site-adjusted power curve. Each curve should list the elevation, temperature and air density used.

Mistissini Project

The power curve used by RES Canada for its energy evaluation has been adjusted to reflect site specific air density of 1.2kg/m³ at an average site altitude of 525.0 m and a temperature of 2.2°C. It has been provided by the manufacturer in *Attachment 8.1.2 (confidential) – 0056-6306_V00 - Performance Specification V136-3.60MW HH105 and HH132* and is summarized in Appendix B of *Attachment 4.1.1 (confidential) – Assessment of the Energy Yield at the Mistissini Wind Farm*.

Vauban Project

The power curve used by RES Canada for its energy evaluation has been adjusted to reflect site specific air density of 1.2kg/m³ at an average site altitude of 444.0 m and a temperature of 4.1°C. It has been provided by the manufacturer in *Attachment 8.1.2 (confidential) – 0056-6306_V00 - Performance Specification V136-3.60MW HH105 and HH132* and is summarized in Appendix B of *Attachment 4.1.2 (confidential) – Assessment of the Energy Yield at the Vauban Wind Farm*.

Identify the assumptions for losses in the calculation of projected annual energy production, including each element in the calculation of losses.

Mistissini Project

A detailed description of the assumptions for losses used in the projected annual energy production can be found in Appendix G of *Attachment 4.1.1 (confidential) – Assessment of the Energy Yield at the Mistissini Wind Farm*.

Vauban Project

A detailed description of the assumptions for losses used in the projected annual energy production can be found in Appendix G of *Attachment 4.1.2 (confidential) – Assessment of the Energy Yield at the Vauban Wind Farm*.

If your bid includes a delivery forecast which is substantially different than NREL data would suggest, please reconcile the differences.

Not applicable.

Landfill Gas

Provide a gas production forecast for each landfill. Provide a table that shows the annual, monthly and hourly projection of gas flow and energy export from each landfill.

Not applicable.

Provide supporting data that illustrates the expected generation from each landfill based on the projected gas production.

Not applicable.

Describe any contingencies or constraints that could affect the availability of fuel or the energy resource for the project and any contingency plans for meeting projected generation levels.

Not applicable.

If the landfill gas is provided by pipeline, provide information related to gas pipeline delivery, including gas pipeline interconnection points of the landfills delivering the gas into the pipeline system.

Not applicable.

Biomass

Describe specifically how the project will conform to the Massachusetts biomass laws and regulations M.G.L. c. 25A, § 11F, and 225 CMR 14.00.

Not applicable.

Provide a resource assessment of available biomass fuel for the proposed project and its proximity to the project site.

Not applicable.

Provide a plan for obtaining the biomass fuel, including a transportation plan.

Not applicable.

Provide any contracts or letters of intent to acquire and transport the biomass fuel.

Not applicable.

Demonstrate that projected energy output for the project over the term of the contract is consistent with the energy supply available.

Not applicable.

Describe any contingencies or constraints that could affect the availability of fuel or the energy resource for the project and any contingency plans for meeting projected generation levels.

Not applicable.

Solar

Provide an assessment of the available solar incidence or resource. Describe any trends in generation capability over time (i.e., annual decline rate of expected output).

Not applicable.

Describe the methodology used to generate the projected generation and describe the in-house or consulting expertise used to arrive at the generation estimates.

Not applicable.

Hydropower

Describe the project characteristics in terms of water flow (on a monthly basis) and head, and state the assumptions regarding seasonal variations, and a conversion of such flow into megawatts and megawatt-hours.

Not applicable.

Provide monthly flow duration curves based upon daily stream flow records.

Not applicable.

Identify if the project is run-of-river or has storage capability.

Not applicable.

Specify if the project is new, or if the project is an expansion of an existing facility.

Not applicable.

Describe why the generation proposal qualifies as Incremental Hydropower Generation. If the entire project is not new, specify the amount of power provided to or sold into the ISO-NE market during 2014, 2015, and 2016. Provide information which demonstrates that the resources and transmission capacity described in your proposal are capable of providing an increase in the amount of such power compared to the average power deliveries in ISO-NE over those three years.

Not applicable.

The bidder must disclose in its bid how it proposes to certify that the environmental attributes are included with the energy delivered.

Not applicable.

Other information as required to describe the energy resource plan

Identification of fuel supply (if applicable) Not applicable

What is the availability of the fuel supply? Not applicable

Does the bidder have any firm commitments from fuel suppliers? If so, please provide a copy of any agreements with confidential information redacted if necessary.

Yes: ☐ No: ☐

Not applicable

4.2 Clean Energy Generation Delivery Plan

Please provide documentation that any clean energy plan delivery plan that includes hydroelectric generation meets the definition of "Incremental Hydroelectric Generation" as defined in the body of the RFP.

Not applicable

Please provide an energy delivery plan and profile for the proposed project, including supporting documentation. The energy delivery profile must provide the expected Clean Energy Generation to be Delivered into the ISO-NE market settlement system and permit the Evaluation Team to determine the reasonableness of the projections for purposes of Sections 2.2.1.3 Eligible Bid Categories and 2.2.1.7 Minimum Contract Size of the RFP. Such information should be consistent with the energy resource plan provided above and also considering any and all constraints to physical delivery into ISO-NE.

RES Canada Wind Portfolio

As summarized in Section 2 of this bid, the RES Canada Wind Portfolio will deliver energy onto the Massachusetts Pool Transmission Facilities (PTFs) via two long-term transmission service agreements (and two sets of transmission facilities), with the two transmission service providers associated with this bid: HQT and GridAmerica.

The US transmission service agreements descriptions and delivery plans are detailed in the GSPL Project descriptions provided with this bid. These demonstrate contractual delivery of the Clean Energy Generation from the HQT system to the PTFs.

The Quebec transmission service is also addressed in the GSPL Project descriptions, since the Long-Term, Firm, Point-to-Point Transmission Service Agreement with HQT (the HQT TSA) will consider both the new transmission from the HQT system, and the new Clean Energy Generation onto the HQT system.

As detailed in Section 6.6, each of the RES Canada Wind Portfolio projects will be considered in the HQT TSA and will connect and deliver at one of the Points-of-Receipt of the HQT TSA. The Point-of-Delivery of the HQT TSA will be the Point-of-Receipt of the GSPL Project. The transmission costs of the HQT TSA are defined in the HQT Open Access Transmission Tariff (HQT OATT) and the RES Canada Wind Portfolio projects will be responsible for the transmission costs associated with their portion of the overall generation requiring capacity reservation under the HQT TSA. The current cost of transmission under the HQT OATT is \$76.13 CAD/kW of reserved capacity per year. This value is revised by HQT each year, via lodging an application to the public utility commission of Quebec (*Régie de l'énergie du Québec*), but has traditionally only increased by standard inflation. RES Canada has incorporated these costs into its financial modelling and project energy pricing.

The HQT interconnection process is further detailed, with associated timelines, in Section 10 (Project Schedule) and includes:

- Preliminary Interconnection Study Request
- Interconnection Request
- Pre-Project Interconnection Study Agreement
- Pre-Project Interconnection Study
- Interconnection Agreement
- Construction of project gentie and system upgrades
- Backfeed Power Date (MSTI)

It is important to note that in the Quebec market, HQT builds the interconnecting gentie and performs the system upgrades and expects the generation project owner to reimburse it for these costs or to commit to a long-term TSA, whose associated payments would serve as a replacement for the reimbursement of these costs, as per the terms and conditions of the HQT OATT. In the case of the RES Canada Wind Portfolio projects, these costs have been accounted for, while assuming a certain level of sharing of the HQT TSA charges, based on their pro-rata use of the HQT TSA capacity reservations, and the associated reductions to the system upgrade and interconnection cost reimbursement obligations that result.

Although RES Canada has noted, in Part VII of the Mistissini and Vauban CPPD forms, that it does not intend to qualify, clear, and take on a Capacity Supply Obligations, the rights with regards to

Capacity Supply associated with the Clean Energy Generation from the Mistissini and Vauban projects are included in this offer.

Mistissini Project

In order to connect the Mistissini Project to the HQT system, RES Canada will file an interconnection request with HQT according to their “Demande de Raccordement de Centrale” process. RES Canada has initiated this process by filing preliminary interconnection study requests with HQT for its Mistissini Project. The result of this study is included as *Attachment 4.2.1 (confidential) – Mistissini Preliminary Interconnection Study Results* (French only). The results of this study are summarized below and a courtesy translation can be provided if required.

[REDACTED]

The delivery profile for the project can be found in Appendix F of *Attachment 4.1.1 (confidential) – Assessment of the Energy Yield at the Mistissini Wind Farm* in 12 X 24 format as well as in the attached CPPD form. *Attachment 4.1.1 (confidential) – Assessment of the Energy Yield at the Mistissini Wind Farm* presents in detail the methodology used by RES Canada to generate a reasonable delivery profile.

[REDACTED]

The remaining constraints included in the delivery profile are the losses applicable to wind generating facilities. These include but are not limited to project collector and substation losses, transmission and turbine availability losses, environmental losses, wake and underperformance losses.

Vauban Project

In order to connect the Vauban Project to the HQT system, RES Canada will file an interconnection request with HQT according to their “Demande de Raccordement de Centrale” process. RES Canada has initiated this process by filing preliminary interconnection study requests with HQT for its Vauban Project. The result of this study is included as *Attachment 4.2.2 (confidential) – Vauban Preliminary Interconnection Study Results* (French only). The results of this study are summarized below and a courtesy translation can be provided if required.

[REDACTED]

The delivery profile for the project can be found in Appendix F of *Attachment 4.1.2 (confidential) – Assessment of the Energy Yield at the Vauban Wind Farm* in 12 X 24 format as well as in the attached CPPD form. *Attachment 4.1.2 (confidential) – Assessment of the Energy Yield at the Vauban Wind Farm* presents in detail the methodology used by RES Canada to generate a reasonable delivery profile.

[REDACTED]

The remaining constraints included in the delivery profile are the losses applicable to wind generating facilities. These include but are not limited to project collector and substation losses, transmission and turbine availability losses, environmental losses, wake and underperformance losses

Clean Energy Generation for projects containing new Class I eligible resources only must comply with Section 2.2.2.7 of the RFP. They must submit a delivery profile guaranteeing 70% of the energy in their delivery profile for the Winter Peak Period over the course of every Winter Peak Period on the CPPD form in their bidder response package.

As per requirements of Section 2.2.2.7, RES Canada submitted its projected delivery profile in the CPPD form, included in *Attachment 1.1. (confidential) – RES Canada Wind Portfolio Category II CPPD Form*.

Clean Energy Generation for projects containing firm service hydroelectric generation, and Clean Energy from new Class I RPS eligible resources paired with firm service hydroelectric generation must comply with Section 2.2.2.7 of the RFP. They will be required to submit a delivery profile with no Winter Peak Period hour less than 60% of their highest annual single hourly delivery claimed in their annual delivery profile as submitted as a part of their CPPD form in their bidder response package. Bidders will be required to guarantee the submitted delivery profile in all hours during the Winter Peak Period. Bidders should supply any studies performed to support this profile. Bidders should respond to all information requests which are relevant to the bid in a timely manner.

Not applicable

4.3 REC/Environmental Attribute Delivery Plan

Please provide documentation demonstrating that the project will Deliver GIS Certificates representing those RECs or Environmental Attributes. For projects located outside of the ISO-NE control area, describe how the Delivered energy and associated RECs or Environmental Attributes will satisfy NEPOOL-GIS rules for the Delivery of GIS Certificates.

As Class I RPS eligible resources, energy generated from the Mistissini and Vauban projects and imported into the ISO-NE control area will be accounted for through the creation of GIS Certificates in accordance with NEPOOL-GIS operating rules (Rule 2.1 (a) and Rule 2.7). RES Canada will register as an “Importing Account Holder” under the NEPOOL-GIS operating rules and will complete an RPS Class I Statement of Qualification Application with respect to all generation units produced by the projects in Quebec, a recognized adjacent control area.

SECTION 5 OF APPENDIX B OF THE RFP
FINANCIAL/LEGAL

Bidders are required to demonstrate the financial viability of their proposed project. Bidders should provide the following information:

- 5.1 Each bidder is required to submit information and documentation that demonstrates that a long term contract resulting from this RFP Process would either permit the bidder to finance its proposal that would otherwise not be financeable, or assist the bidder in obtaining financing of its proposal.

GSPL Project

The Granite State Power Link project (GSPL Project) will be held by a new project-specific company to be set up as a direct wholly-owned subsidiary of GridAmerica Holdings Inc. (GridAmerica) (see Figure 5.1.1). Pursuant to an arrangement between Citizens Enterprises Corporation (Citizens Energy) and GridAmerica, Citizens Energy may acquire up to a 10% interest in the GSPL Project.

GridAmerica will finance the GSPL Project through internally generated funds from its parent company. While GridAmerica has committed significant funds to the development and siting of the GSPL Project, it seeks a long-term contract to support the financing and completion of the GSPL Project.



* Project-specific entity not yet formed

Figure 5.1.1 GSPL Project Position Within High-Level Organizational Structure

As set forth in Section 5.2(a) and Figure 5.1.1 above, GridAmerica is a direct wholly-owned subsidiary of National Grid USA (NGUSA), a Delaware corporation, which is in turn a direct wholly-owned subsidiary of National Grid North America Inc. and an indirect wholly-owned subsidiary of National Grid plc. National Grid plc, the ultimate parent of GridAmerica, manages its financing and

liquidity on a group basis. For the U.S. subsidiaries under NGUSA, including GridAmerica, the short-term liquidity requirements are managed via the groups regulated and non-regulated money pools. GridAmerica can lend and borrow from the non-regulated money pool on a daily basis.

GridAmerica will provide the primary debt/equity financing for the development phase of the GSPL Project. As NGUSA will provide all necessary lending support and financial backing to GridAmerica, GridAmerica has the requisite financial capability to successfully develop, construct and operate the GSPL Project. NGUSA, through its subsidiaries, has a proven track record of developing, financing, constructing and operating transmission facilities in New England. NGUSA subsidiaries have financed, developed and operated approximately \$7 billion in energy projects over the past three years (2014-2016).

NGUSA has an investment-grade corporate credit rating and a stable long-term outlook. Specifically, NGUSA's senior unsecured debt is rated by S&P (BBB+/Stable) and Moody's (Baa1/Stable), which are investment-grade ratings assigned to the best quality and lowest risk issuers to indicate a very strong capacity to meet financial commitments. Investment grade credit ratings provide NGUSA with access to the full spectrum of public and private debt markets. The latest credit reviews are attached (see *Attachment 5.1.1 (confidential) - NGUSA Standard and Poor's 2013* and *Attachment 5.1.2 (confidential) - NGUSA Moody's 2016*).

As shown in the NGUSA cash flow statement (*Attachment 5.1.3 (confidential) - NGUSA 3 Years Cash Flow 2014-2016*), NGUSA funds approximately \$2.3 billion in capital spending each year to construct electric transmission and other infrastructure projects as assigned or required by its subsidiaries. NGUSA has additional funding capacity to increase borrowing levels to fund projects incorporated into the investment plans.

GridAmerica's sources of funding of the GSPL Project during construction and operations will include a combination of cash flows from operations, short-term borrowings from the internal non-regulated money pool, issuance of inter-company debt and equity contributions from its parent company, NGUSA, if necessary. NGUSA will also periodically consider issuing long-term debt depending on the capital market conditions and capital structure of the business.

GridAmerica intends to finance the GSPL Project with internally generated funds during the construction period. GridAmerica may explore refinancing options once the project is in operation, including limited or non-recourse options. Any limited or non-recourse financing should be positively impacted by a long-term renewable energy contract.

RES Canada Wind Portfolio

A long-term PPA issued by a credit-worthy counterpart establishes a reliable project revenue over the project lifetime of 20 years and will permit RES Canada to obtain short-term and long-term financing through equity investors and lenders. This will include major current and past investors in projects that RES Canada and its affiliates have developed, constructed and operated. See *Attachment 5.3.1 (confidential) - RES Financed Projects* for a list of projects financed by RES Canada and its affiliated companies.

5.2 (a)² Please provide a description of the business entity structure of the bidder's organization from a financial and legal perspective, including all general and limited partners, officers, directors, managers, members and shareholders, involvement of any subsidiaries supporting the project, and the providers of equity and debt during project development. Provide an organization chart showing the relationship between the equity and debt participants and an explanation of the relationships. For jointly owned facilities, identify all owners and their respective interests, and document the Bidder's right to submit a binding proposal.

GridAmerica and the GSPL Project

As described in Section 5.1, the GSPL Project will be held by a new project-specific company to be set up as a direct wholly-owned subsidiary of GridAmerica. The GSPL Project will be financed primarily by GridAmerica, and Citizens Energy Corporation is expected to acquire up to a 10% interest in the project. GridAmerica is a Delaware holding corporation set up to hold National Grid's electric transmission investments in the United States. It is a direct wholly-owned unregulated subsidiary of NGUSA. NGUSA is a public utility holding company with regulated subsidiaries engaged in the generation of electricity and the transmission, distribution and sale of both natural gas and electricity. NGUSA is a direct wholly-owned subsidiary of National Grid North America Inc. and an indirect wholly-owned subsidiary of National Grid plc, a public limited company incorporated under the laws of England and Wales. National Grid plc's ordinary shares are listed on the London Stock Exchange and its stock is also held by U.S. investors through American Depositary Shares that are listed on the New York Stock Exchange.

GridAmerica is managed by a Board of Directors, and John Flynn is its sole Director. Table 5.2.1 lists the officers of GridAmerica:

Table 5.2.1 GridAmerica Holdings Inc. Officers

Name	Title
John Flynn	President
Mathew R. Sachs	Vice President
Charles V. DeRosa	Vice President and Treasurer
William Hazelip	Vice President
Macdara Nash	Vice President
Sharon Partridge	Vice President and Controller
Adael Acosta	Assistant Treasurer
Susan Greene	Assistant Treasurer
Arthur Kiperberg	Assistant Treasurer
Timothy E. McAllister	Secretary
James Chicoski	Assistant Secretary
Reshmi Das	Assistant Secretary

² To clarify its responses to the two sections labeled Section 5.2 in the RFP, the Project Proposal has provided responses to Section 5.2(a) and Section 5.2(b)

Citizens Energy is a non-profit company founded in 1979 and headquartered in Boston, MA. Citizens uses profits from the businesses it owns and manages to provide funding for the charitable and social programs it operates to assist low-income families and the elderly. Citizens Energy owns 100% of a for-profit holding company, Citizens Enterprises Corporation, which in turn wholly owns several for-profit subsidiaries, including various special-purpose LLC companies established to participate in discrete energy projects (such as transmission, solar, and wind). Citizens will establish a unique project company to hold its interest in GSPL Project.

Citizens Energy has a 38-year history of financing new business ventures and creating hundreds of millions of dollars of funding to support its charitable programs. In the past 5 years alone, Citizens has successfully financed \$300 million of large-scale energy projects in high-voltage transmission and solar generation. Citizens Energy maintains ongoing working relationships with a number of capital providers to ensure access to capital for its projects, and has the experience and financial capability to successfully finance its share of the GSPL Project.

The senior management of Citizens Energy is provided in Table 5.2.2.

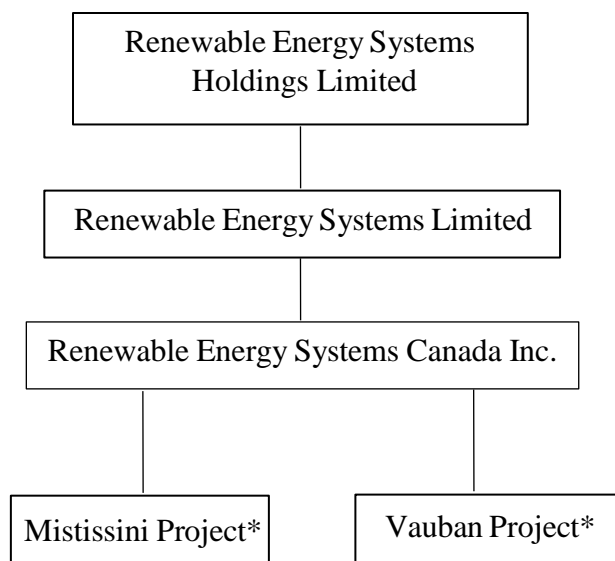
Table 5.2.2 Citizens Energy Officers

Name	Title
Joseph P. Kennedy II	Chairman and President
Peter Smith	Chief Executive Officer
Ernie Panos	Chief Financial Officer

RES Canada Wind Portfolio

The Mistissini and Vauban projects will each be owned by new project-specific limited partnerships to be formed by RES Canada. Two newly- incorporated subsidiaries of RES Canada will act as the general partners of the limited partnerships. A limited partnership will be formed for each of the Mistissini and Vauban projects, as owner of all assets for the respective projects. RES Canada, as limited partner, will fund capital for each project pursuant to a limited partnership agreement. As described in Section 2, Citizens Energy has the ability to invest in a minority ownership position in the Mistissini Project. The directors and officers of general partner will be those individuals identified as the current directors and officers of RES Canada in *Attachment 5.6.2 (confidential) – RES Canada Directors and Officers*.

[REDACTED]



*Project-specific entity not yet formed

Figure 5.2.1: Ownership structure for the Mistissini and Vauban projects

RES Canada and the RES Group

RES Canada is a corporation formed under the laws of the Province of Quebec and has been headquartered and operated from Quebec since 2003. RES Canada is a wholly-owned subsidiary of Renewable Energy Systems Limited (RES Ltd.), which in turn is wholly-owned by RES Holdings. RES Holdings is controlled by its ultimate parent, The McAlpine Partnership Trust. RES Ltd., RES Holdings and The McAlpine Partnership Trust are incorporated in the United Kingdom.

RES Canada, RES Ltd., RES Holdings and their respective affiliated companies (herein collectively referred to as the “RES Group”) have delivered more than 160 wind and solar projects globally, with projects in the United States, Canada, Europe and Australia having a combined capacity of over 12,000 MW.

A listing of the directors, officers, and managers of RES Canada involved in supporting the Mistissini and Vauban projects is attached hereto as *Attachment 5.2.2 (confidential) – RES Canada Managerial Charts*.

5.2 (b) For projects that include new facilities or capital investment, provide a description of the financing plan for the project, including construction and term financing. The financing plan should address the following:

5.2.i. *Who will finance the project and the related financing mechanism or mechanisms that will be used (i.e. convertible debenture, equity or other) including repayment schedules and conversion features.*

GSPL Project

See response to Section 5.1 and 5.2 (a), above.

RES Canada Wind Portfolio

[REDACTED]

During project construction, financing will likely be sourced from an investment-grade investor, using a mix of debt and equity, as well as through conventional construction financing.

5.2.ii. The project's existing initial financial structure and projected financial structure

GSPL Project

See Section 5.1 and 5.2(a) above.

RES Canada Wind Portfolio

[REDACTED]

5.2.iii. Expected sources of debt and equity financing

GSPL Project

See Section 5.1, and 5.2(a) above.

RES Canada Wind Portfolio

[REDACTED]

RES Canada expects to use construction financing and permanent financing with a view to optimizing the cost of capital. RES Canada expects to use US dollar construction financing in the form of floating rate bank debt. This bank debt will either be provided by Canadian-based institutions with access to US dollars, or with other traditional project finance lenders (based in the US or Europe). Construction financing will then be converted to permanent financing on the COD of the project.

[REDACTED]

5.2.iv. Estimated construction costs

GSPL Project

The estimated total capital expenditure for the GSPL Project is \$1.1 billion.

RES Canada Wind Portfolio

The estimated construction costs are as follows:

- total capital expenditure for the GSPL Project is estimated at USD\$1.1 billion
- construction costs for the Mistissini Project are estimated at USD\$340 million
- construction costs for the Vauban Project are estimated at USD\$510 million

5.2.v. The projected capital structure.

GSPL Project

As the GSPL Project will be primarily financed by GridAmerica, with the financial backing and support of NGUSA, as described in Section 5.1, the capital structure of the GSPL Project will approximate that of National Grid plc group's corporate capital structure.

RES Canada Wind Portfolio

See capital structure set out above in Section 5.2.ii.

5.2.vi. Describe any agreements, both pre and post commercial operation date, entered into with respect to equity ownership in the proposed project and any other financing arrangement.

GSPL Project

See Section 5.1 and 5.2(a) above.

RES Canada Wind Portfolio

[REDACTED]

RES Group regularly works with numerous partners to finance projects and has a track record of successfully securing financing for more than 8,000 MW of projects, including two recent wind energy projects in the US: 160 MW Rattlesnake wind project in Texas and 200 MW Bluestem wind project in Oklahoma. **[REDACTED]**

5.2.vii. In addition, the financing plan should address the status of the above activities as well as the financing of development and permitting costs. All bidders are required to provide this information.

GSPL Project

Please refer to Section 5.1 and 5.2.v.

RES Canada Wind Portfolio

Please refer to Section 5.2.i together with the letter of financial support from RES Holdings included as *Attachment 5.2.1 (confidential) – RES Holdings Letter of Financial Support*.

- 5.3 Provide documentation illustrating the experience of the project sponsor in securing financing for projects of similar size and technology. For each project previously financed provide the following information:
- i. Project name and location
 - ii. Project type and size
 - iii. Date of construction and permanent financing
 - iv. Form of debt and equity financing
 - v. Current status of the project

GridAmerica

As explained in Section 5.1, GridAmerica is the primary project sponsor and will finance the GSPL Project through internally generated funds with its parent NGUSA. NGUSA and its U.S. subsidiaries have extensive experience in financing electric infrastructure projects of a similar size and technology to the GSPL Project as shown in Table 5.3.1 below (For purposes of Table 5.3.1, “National Grid” means collectively NGUSA and its subsidiaries).

Table 5.3.1 National Grid's Financing Experience on Similar Projects

New England East West Solution (includes the Interstate Reliability Project (IRP), Rhode Island Reliability Project (RIRP), and Advanced NEEWS Projects)	
i. Location	Massachusetts, Rhode Island, Connecticut
ii. Project type and size	National Grid collaborated with Eversource Energy to construct a three-state transmission suite of projects that involved, among other things, the relocation, siting, and construction of new overhead 115kV and 345kV and reconductoring of existing transmission lines in Massachusetts, Rhode Island and Connecticut for a total transmission line length of 160 miles.
iii. Date of construction and permanent financing	2008 – 2015
iv. Form of debt and equity financing	National Grid financed and constructed the Massachusetts portion of the suite of NEEWS projects using \$100 million of internal money pool financing, in accordance with National Grid's corporate capital structure
v. Current status	Operating
Merrimack Valley/North Shore Upgrade Area Project	
i. Location	Northeastern Massachusetts
ii. Project type and size	The project included the construction of a new 345/115kV gas-insulated substation at Wakefield, MA, a new 345/115kV substation in West Amesbury MA, building of a new 115kV line (K-163), as well as reconductoring of multiple 115kV lines and upgrades at other area substations in Northeastern MA.
iii. Date of construction and permanent financing	2008-2013
iv. Form of debt and equity financing	\$174 million capital projects Project has been financed in accordance with the approved capital structure within the regulatory framework of the associated entity
v. Current status	Operating
Auburn Street Area Projects	
i. Location	Whitman, Massachusetts and surrounding area
ii. Project type and size	The projects included a complete rebuild of the 115kV and 345kV yards and addition of 345 / 115kV transformation at Auburn Street substation, as well as significant 115kV substation work at to other area substations.
iii. Date of construction and permanent financing	2010 – 2013
iv. Form of debt and equity financing	\$98 million capital projects Project has been financed in accordance with the approved capital structure within the regulatory framework of the associated entity
v. Current status	Operating
Bloomington to Vernon Hill	
i. Location	Worcester, Massachusetts
ii. Project type and size	New 115kV cable
iii. Date of construction and permanent financing	2011 – 2012
iv. Form of debt and equity financing	\$34 million Project has been financed in accordance with the approved capital structure within the regulatory framework of the associated entity
v. Current status	Operating
Hampden County Reliability Project (HCRP)	
i. Location	Hampden County, Massachusetts
ii. Project type and size	Design and construction of a new 10-mile 115kV R-170 transmission line from Palmer, MA to Hampden, MA, and a new substation in West Hampden.
iii. Date of construction	2015 – 2016

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and permanent financing	
iv. Form of debt and equity financing	\$32.25 million Project has been financed in accordance with the approved capital structure within the regulatory framework of the associated entity
v. Current status	Operating
Greater Boston and Southern New Hampshire Solution	
i. Location	Southern New Hampshire to Greater Boston
ii. Project type and size	A suite of projects, including: 1) Merrimack Valley Reliability Project (MVRP): 24.5 miles of new overhead 345-kilovolt (kV) line in existing transmission rights-of-way in the towns of Tewksbury, Andover, and Dracut, MA, and Pelham, Hudson, Windham, and Londonderry, NH. The project is being constructed collaboratively with Eversource Energy, which is building the 18-mile portion of the line in NH; National Grid is constructing 6.5 miles in MA. 2) Woburn to Wakefield Line: 8.5 miles of new 345-kV underground cable in the towns of Woburn, Winchester, Stoneham, and Wakefield, MA., and 3) Mystic to Woburn Line: 8 miles of new 115-kV underground cable in the towns of Woburn, Winchester, Medford, Somerville, Boston (Charlestown), and Everett, MA.
iii. Date of construction and permanent financing	2016 – 2019
iv. Form of debt and equity financing	National Grid's portion of the 345kV construction project is estimated at \$87 million. The entire suite of projects is projected to cost \$190 million Project has been financed in accordance with the approved capital structure within the regulatory framework of the associated entity
v. Current status	In the permitting and construction phase. Expected to be in service in 2018.
Salem Cable Rebuild	
i. Location	Salem, Massachusetts
ii. Project type and size	National Grid is in the process of rebuilding the two 115kV cables, each approximately 1.7 miles in length, in the City of Salem, Massachusetts. The project involves engineering, siting and constructing a complex cable system in the historic downtown section of the city.
iii. Date of construction and permanent financing	2016 – 2017
iv. Form of debt and equity financing	Estimated cost of \$63 million Project has been financed in accordance with the approved capital structure within the regulatory framework of the associated entity
v. Current status	In the construction phase
Sandy Pond Controls Rebuild	
i. Location	Between Quebec and Massachusetts
ii. Project type and size	National Grid owns and operates a high voltage direct current (HVDC) transmission line rated at ± 450 kV that is a key section of an interconnector between New England and Canada. National Grid operates the New England portion of the interconnection known as Phase 2 between New England and Canada. Phase 2 includes HVDC transmission lines from La Grande Station, James Bay, Quebec to Des Cantons and from Monroe, NH to Sandy Pond Station in MA, and three converter terminals (Radisson, Nicolet, and Sandy Pond), which were placed in service in the early 1990s. Sandy Pond is a $\pm 2,000$ MW ± 450 kV DC bipolar converter terminal. This interconnection system from Quebec to Sandy Pond station in Massachusetts is the only large-scale multi-terminal HVDC system in the world today.
iii. Date of construction	2015 – 2016

and permanent financing	
iv. Form of debt and equity financing	\$23 million Cash call to equity owners for capital contributions
v. Current status	Operating
Sea2Shore	
i. Location	Block Island, RI to Narragansett, RI
ii. Project type and size	A 20-mile undersea transmission cable connecting the first off-shore wind farm in the US to Block Island, Rhode Island and connecting into the National Grid's transmission network in Narragansett Rhode Island.
iii. Date of construction and permanent financing	2016
iv. Form of debt and equity financing	Estimated cost of \$117 million Project has been financed in accordance with the approved capital structure within the regulatory framework of the associated entity
v. Current status	Operating

Additionally, Citizens Energy has successfully developed and financed \$300 million of large-scale energy projects in high-voltage transmission and solar generation, including the following:

- **Transmission:** In 2012, Citizens invested \$100 million in the \$1.9 billion Sunrise Powerlink in Southern California, developed in partnership with San Diego Gas & Electric. Citizens owns 50% of the line's capacity in Imperial County (through its wholly-owned subsidiary Citizens Sunrise Transmission), and successfully financed its ownership share with 100% debt provided from John Hancock, New York Life, and Delaware Investments.
- **Solar:** From 2013-2017, Citizens has financed ~\$200 million of solar generation (86 megawatts) it has developed, built, and currently owns and operates in Massachusetts and Georgia. Across all 29 projects, Citizens financed:
 - \$69 million of tax equity from US Bank and Trust
 - \$108 million of debt from CIT, Union Bank & Trust, Eastern Bank, and Boston Private Bank
 - \$22 million of sponsor equity, funded internally from Citizens Energy

RES Canada and the RES Group

A list of key projects successfully financed by RES Group members is included as *Attachment 5.3.1 (confidential) – RES Financed Projects*.

- 5.4 For projects that include new facilities or capital investment, provide evidence that the bidder has the financial resources and financial strength to complete and operate the project as planned.

GSPL Project

While GridAmerica does not have external debt and is not rated by the credit agencies, as noted in Section 5.1, its parent corporation, NGUSA, which will provide lending support and financial backing for GridAmerica's investment in the GSPL Project, has an investment-grade corporate credit rating and a stable long-term outlook. See Section 5.1 and *Attachment 5.1.1(confidential) NGUSA Standard and Poor's 2013* and *Attachment 5.1.2 (confidential) NGUSA Moody's 2016*). Also, see Section 5.3.

RES Canada Wind Portfolio

[REDACTED]

- 5.5 Provide complete copies of the most recent audited financial statement or annual report for each bidder for each of the past three years; including affiliates of the bidder (if audited statements are not available, reviewed or compiled statements are to be provided). Also, provide the credit ratings from Standard & Poor's and Moody's (the senior unsecured long term debt rating or if not available, the corporate rating) of the bidder and any affiliates and partners.

GridAmerica

The newly formed entity to own and operate the GSPL Project will be a special purpose vehicle with no audited financial statements. The new project-specific company will be established as a direct wholly-owned subsidiary of GridAmerica, which in turn is a direct wholly-owned subsidiary of NGUSA. NGUSA audited financial statements for the period ending March 31, for years 2014 - 2016, are provided as *Attachment 5.5.1 - NGUSA March 2014*, *Attachment 5.5.2 - NGUSA March 2015*, and *Attachment 5.5.3 - NGUSA March 2016*.

As stated in Sections 5.1 and 5.4 above, NGUSA has an investment-grade corporate credit rating and a stable long-term outlook. Specifically, NGUSA's senior unsecured credit is rated by S&P (BBB+/Stable) and Moody's (Baa1/Stable). The latest credit reviews are provided as *Attachments 5.1.1(confidential)* and *5.1.2 (confidential)*.

RES Canada

RES Canada does not prepare audited financial statements. RES Canada's financials are consolidated into RES Holdings' annual financial statements. Copies of RES Holdings' financial statements for the last three years (October 31, 2014, October 31, 2015 and October 31, 2016) are included as *Attachment 5.5.4 (confidential) - RES Holdings FS_31 October 2014*, *Attachment 5.5.5 (confidential) - RES Holdings FS_31 October 2015* and *Attachment 5.5.6 (confidential) - RES Holdings FS_31 October 2016*.

RES Canada and RES Holdings are not rated by credit rating agencies.

- 5.6 Please also include a list of the board of directors, officers and trustees for the past three years and any persons who the bidder knows will become officers, board members or trustees.

GridAmerica

A list of the current board of directors and officers for GridAmerica is provided in Table 5.2.1. *Attachment 5.6.1 – GridAmerica Board Positions and Officers* provides information regarding changes over the past three years. The officer/board member who will be responsible for this project will be Will Hazelip, Vice President, GridAmerica. Future officers, board members and trustees have not been determined at this time.

RES Canada

A list of current and past directors and officers of RES Canada is included as *Attachment 5.6.2 (confidential) – RES Canada Directors and Officers*. The current RES Canada directors and officers will act in that same capacity for the general partners of the limited partnerships for the Mistissini and Vauban projects. Future officers, board members and trustees have not been determined at this time.

- 5.7 The bidder should demonstrate its ability (and/or the ability of its credit support provider) to provide the required security, including its plan for doing so.

GSPL Project

The security requirement for the GSPL Project will be funded through cash on hand, letter of credit or via additional debt funding from GridAmerica, as described in Section 5.1.

RES Canada Wind Portfolio

[REDACTED]

- 5.8 Provide a description of any current or recent credit issues/ credit rating downgrade events regarding the bidder or affiliate entities raised by rating agencies, banks, or accounting firms.

GridAmerica

The primary credit provider for the GSPL Project is GridAmerica, a direct wholly-owned subsidiary of NGUSA. As explained in Section 5.1, GridAmerica does not have external debt and is not rated by the credit agencies. The credit position of GridAmerica's parent NGUSA's senior unsecured debt is Stable at both S&P and Moody's - S&P (BBB+/Stable) and Moody's (Baa1/Stable) ratings. There are no credit issues with these companies. The latest credit reviews are provided as Attachments 5.1.1(confidential) and 5.1.2(confidential).

NGUSA has consistently maintained its credit ratings over the last six years.

RES Canada and the RES Group

Neither RES Canada nor any of the RES Group members is involved in any negative credit issues, including downgrade events, or negative actions by any lender or accounting firm.

- 5.9 Describe the role of the Federal Production Tax Credit or Investment Tax Credit (or other incentives) on the financing of the project.

Not applicable.

- 5.10 Bidders must disclose any pending (currently or in the past three years) litigation or disputes related to projects developed, owned or managed by Bidder or any of its affiliates in the United States, or related to any energy product sale agreement.

GridAmerica

There are no pending (currently or in the past three years) litigation or known disputes related to competitive transmission projects developed, owned or managed by GridAmerica or any of its affiliates in the United States. This response does not include information that may be in the possession of Distribution Companies affiliated with GridAmerica.

RES Canada and RES Americas

A list of litigation and disputes involving RES Canada or its affiliates in the United States for the past three years is attached hereto as *Attachment 5.10 (confidential) – Litigation and Disputes*.

- 5.11 What is the expected operating life of the proposed project? What is the depreciation period for all substantial physical aspects of the bid, including generation facilities, transmission lead lines to move power to the grid, transmission proposals, and mandatory and voluntary transmission system upgrades?

The expected operating life and depreciation period is 40 years for the GSPL Project and 20 years for the Mistissini and Vauban projects.

- 5.12 For projects that include new facilities or capital investment, has the bidder already obtained financing, or a commitment of financing, for the project? If financing has not been obtained, explain how obtaining a long-term agreement as proposed will help you in obtaining financing for the proposed project, in obtaining more favorable terms for the financing of the proposed project, or in supporting the future capital investment.

GSPL Project

Please refer to Section 5.1.

RES Canada Wind Portfolio

Please refer to Section 5.2.

- 5.13 State whether the bidder or its affiliates have executed agreements with respect to energy, RECs and/or capacity for the project (including any agreements that have been terminated) and provide information regarding the associated term and quantities, and whether bidder has been alleged to have defaulted under or breached any such agreement.

RES Canada has not entered into any such agreements.

- 5.14 List all of the Bidder's affiliated entities and joint ventures transacting business in the energy sector.

GridAmerica

Following is a list of GridAmerica's affiliated entities and joint ventures actively engaged in the generation of electricity, and the transmission, distribution and sale of electricity and natural gas in the US and UK:

US:

- ALGONQUIN GAS TRANSMISSION, LLC
- BOSTON GAS COMPANY
- COLONIAL GAS COMPANY
- CLEAN LINE ENERGY PARTNERS LLC
- DOMINION MIDSTREAM PARTNERS, LP
- KEYSPAN GAS EAST CORPORATION
- MASSACHUSETTS ELECTRIC COMPANY
- MILLENNIUM PIPELINE COMPANY, LLC
- NANTUCKET ELECTRIC COMPANY
- NATIONAL GRID GENERATION LLC
- NATIONAL GRID GLENWOOD ENERGY CENTER, LLC
- NATIONAL GRID LNG LLC
- NATIONAL GRID PORT JEFFERSON ENERGY CENTER, LLC
- NATIONAL GRID TRANSMISSION SERVICES CORPORATION
- NEW ENGLAND ELECTRIC TRANSMISSION CORPORATION
- NEW ENGLAND HYDRO-TRANSMISSION CORPORATION
- NEW ENGLAND HYDRO-TRANSMISSION ELECTRIC COMPANY, INC.
- NEW ENGLAND POWER COMPANY
- NEW YORK TRANSCO LLC
- NIAGARA MOHAWK POWER CORPORATION
- THE BROOKLYN UNION GAS COMPANY

- THE NARRAGANSETT ELECTRIC COMPANY
- TRANSGAS, INC.
- VERMONT GREEN LINE DEVCO, LLC

UK:

- NATIONAL GRID GAS PLC
- NATIONAL GRID GRAIN LNG LIMITED
- NATIONAL GRID ELECTRICITY TRANSMISSION PLC
- NATIONAL GRID INTERCONNECTOR HOLDINGS LIMITED
- CADENT GAS LIMITED (previously National Grid Gas Distribution Limited)
- BRITNED LIMITED

The GSPL Project will be held by a new project-specific company to be set up as a direct wholly-owned subsidiary of GridAmerica. Refer to Sections 5.1 and 5.2 for additional information.

RES Canada

A list of RES Canada's affiliated entities and joint ventures transacting business in the energy sector is attached hereto as *Attachment 5.14 (confidential) - RES Canada Affiliates by Country*.

- 5.15 Has Bidder, or any affiliate of Bidder, in the last five years, (a) consented to the appointment of, or was taken in possession by, a receiver, trustee, custodian or liquidator of a substantial part of its assets, (b) filed a bankruptcy petition in any bankruptcy court proceeding, (c) answered, consented or sought relief under any bankruptcy or similar law or failed to obtain a dismissal of an involuntary petition, (d) admitted in writing of its inability to pay its debts when due, (e) made a general assignment for the benefit of creditors, (f) was the subject of an involuntary proceeding seeking to adjudicate that Party bankrupt or insolvent, (g) sought reorganization, arrangement, adjustment, or composition of it or its debt under any law relating to bankruptcy, insolvency or reorganization or relief of debtors?

GridAmerica

Neither GridAmerica nor any affiliate of GridAmerica has engaged in the aforementioned actions related to bankruptcy in the last five years. This response does not include information that may be in the possession of Distribution Companies affiliated with GridAmerica.

RES Canada

Neither RES Canada nor any affiliate of RES Canada has engaged in the aforementioned actions related to bankruptcy in the last five years.

- 5.16 Briefly describe any known conflicts of interest between Bidder or an affiliate of Bidder and any Distribution Company, or any affiliates of the foregoing.

GridAmerica

GridAmerica and its affiliates do not have any known conflicts of interest with any Distribution Company and their affiliates that are not appropriately addressed through the Utility Standards of Conduct applicable to this solicitation and other state and federal standards of conduct that apply to GridAmerica and its affiliates.

RES Canada

RES Canada and its affiliates do not have any known conflicts of interest with any Distribution Company or any of their affiliates.

- 5.17 Describe any litigation, disputes, claims or complaints involving the Bidder or an affiliate of Bidder, against any Distribution Company or any affiliate of any Distribution Company.

GridAmerica

There is currently no pending significant litigation, disputes, claims or complaints involving GridAmerica or an affiliate of GridAmerica against any Distribution Company or any affiliate of any Distribution Company. From time to time NGUSA's operating company subsidiaries and other subsidiaries may be involved in routine business, commercial, contractual and tort litigation, disputes, claims or complaints in which a Distribution Company may be involved. This response does not include information that may be in the possession of Distribution Companies affiliated with GridAmerica.

RES Canada

RES Canada is not aware of any litigation, dispute, claim or complaint involving RES Canada or an affiliate of RES Canada against any Distribution Company or any affiliate of any Distribution Company.

- 5.18 Describe any litigation, disputes, claims or complaints, or events of default or other failure to satisfy contract obligations, or failure to deliver products, involving Bidder or an affiliate of Bidder, and relating to the purchase or sale of energy, capacity or renewable energy certificates or products.

GridAmerica

In the U.S., there are no current pending litigations, known disputes, claims or complaints involving GridAmerica relating to the purchase or sale of energy, capacity or renewable energy certificates or products. From time to time, NGUSA's operating company subsidiaries and other subsidiaries may be involved in routine collections, business, commercial and tort litigation which may involve the purchase and sale of energy. NGUSA's subsidiary Massachusetts Electric Company is involved in litigation entitled Allco Renewable Energy LTD v. Massachusetts Electric Company, Angela M. O'Connor, Juliette A. Westbrook, Robert Hayden and Judith Judson which matter broadly involves the purchase and sale of energy. NGUSA's other subsidiary The Narragansett Electric Company is involved in litigation entitled Riggs, et. al. v. Margaret Curran, Paul Roberti, Herbert DeSimone, Jr.,

The Narragansett Electric Company and Deepwater Wind Block Island, LLC., which matter broadly involves the purchase and sale of energy.

In the ordinary course of GridAmerica's UK affiliates' operations, they are parties to various litigations, claims and investigations, or events of defaults or other failures to satisfy contract obligations, or failures to deliver products, involving such affiliates and relating to the purchase or sale of energy, capacity or renewable energy certificates or products. Recently a counterparty to an energy supply contract with one of GridAmerica's UK affiliates terminated a contract claiming termination payment or liquidated damages under the terms of the contract, the ultimate resolution of which is not expected to have a material adverse effect on such affiliates' operations, cash flows or financial position.

This response does not include information that may be in the possession of Distribution Companies affiliated with GridAmerica, other than as described above.

RES Canada

RES Canada is not aware of any litigation, dispute, claim or complaint, or event of default or other failure to satisfy contract obligations, or failure to deliver products, involving RES Canada or an affiliate of RES Canada, and relating to the purchase or sale of energy, capacity or renewable energy certificates or products.

- 5.19 Confirm that Bidder, and the directors, employees and agents of Bidder and any affiliate of Bidder are not currently under investigation by any governmental agency and have not in the last four years been convicted or found liable for any act prohibited by State or Federal law in any jurisdiction involving conspiracy, collusion or other impropriety with respect to bidding on any contract, or have been the subject of any debarment action (detail any exceptions).

GridAmerica

Neither GridAmerica nor any of its director, employee and agent or affiliates is currently under investigation by any governmental agency and has not in the last four years been convicted or found liable for any act prohibited by State or Federal law in any jurisdiction involving conspiracy, collusion, or other impropriety with respect to bidding on any contract, nor has it been subject to any debarment action with respect to bidding on any contract. This response does not include information that may be in the possession of Distribution Companies affiliated with GridAmerica.

RES Canada

Neither RES Canada nor any director, employee or agent of RES Canada or any affiliate of RES Canada is currently under investigation by any governmental agency and has not in the last four years been convicted or found liable for any act prohibited by State or Federal law in any jurisdiction involving conspiracy, collusion, or other impropriety with respect to bidding on any contract, nor has it been subject to any debarment action.

5.20(a) Identify all regulatory and other approvals needed by Bidder to execute a binding sale agreement.

GridAmerica

The approvals needed by the GSPL Project to execute a Firm Transmission Capacity Purchase Agreement are:

(i) Federal Energy Regulatory Commission (“FERC”) approval of negotiated rate authority, FERC approval of the Firm Transmission Capacity Purchase Agreement, and FERC approval of the ISO-NE rate schedule governing the rates and terms of service for the sale of additional transmission capacity over the line; and, for Category IV bids, FERC acceptance of the Transmission Rights Transfer Agreement under which transmission capacity sold to the EDCs as part of a Category IV bid under the Firm Transmission Capacity Purchase Agreement is reassigned to the Clean Energy Generation supplier for purposes of scheduling the Clean Energy Generation delivered to the EDCs, whether through a filing of the agreement itself or reporting the agreement in an Electric Quarterly Report; see Section 5.20 (b) for approval process and timing;

(ii) Land rights - see Section 6.2 for discussion of acquisition by the GSPL Project of real property rights from relevant third parties and timeline for obtaining any required landowner approvals or consents;

(iii) Zoning - see Section 6.3 for discussion of any zoning approvals required and being sought by the GSPL Project, and the timeline for obtaining such approvals;

(iv) FERC acceptance of an Interconnection Agreement negotiated between the GSPL Project (or an affiliate thereof), ISO-NE, and the local transmission owner in ISO-NE (approved within 60 days after filing with FERC, assuming that the agreement is not disputed) - see Section 6.6 for a discussion of the status of ISO-NE approval of the GSPL Project’s interconnection requests for the project, and related approval processes and timelines; and the HQT transmission service request, and

(v) Permits - see Sections 7.1 and 7.2 for GSPL Project’s discussion of Canadian permits and all United States Federal, state and local permits, approvals and licenses required for the GSPL Project, and the applicable timelines for obtaining the same.

The Board of Directors of GridAmerica (or the board of the GSPL Project’s operating company) will need to approve the Firm Transmission Capacity Purchase Agreement related to the Category II bid and authorize an appropriate officer of GridAmerica (or the GSPL Project’s operating company) to execute the same.

For Category IV bids the Clean Energy Generation supplier and the EDCs will need to approve and execute one or more Transmission Rights Transfer Agreements.

RES Canada

RES Canada will require internal approval from senior management prior to executing a binding sale agreement. No regulatory approvals are required in order to execute a binding sale agreement.

5.20(b) Describe how the project will conform to FERC's applicable regulatory requirements, including, but not limited to, FERC requirements relating to allocation of transmission capacity and open access, the justness and reasonableness of rates, the potential for undue preference or discrimination, and affiliate dealings, if any. Describe how your proposed approach is consistent with FERC precedent and ratemaking principles.

GSPL Project

Upon selection of this bid, the GSPL Project will file an application under Section 205 of the FPA for approval of negotiated rate authority under FERC procedural guidelines and Part 35 of FERC's regulations. The Commission applies a four-factor analysis in evaluating negotiated rate applications: (1) the justness and reasonableness of rates; (2) the potential for undue discrimination; (3) the potential for undue preference, including affiliate preference; and (4) regional reliability and operational efficiency requirements. *See, e.g., Allocation of Capacity on New Merchant Transmission Projects and New Cost-Based, Participant-Funded Transmission Projects*, 142 FERC ¶ 61,038 at P 4 & n.6 (2013) ("Policy Statement"); *Chinook Power Transmission, LLC*, 126 FERC ¶ 61,134 at P 37 (2009).

The GSPL Project will satisfy the first factor by assuming the full market risk for the Project, not seeking recovery of the costs of the Project from captive ratepayers, not allocating capacity to an affiliate (or demonstrating that any such allocation was not the result of an inappropriate preference and will not result in subsidization of the Project by affiliated customers), demonstrating that no entity is required to purchase transmission service over the Project, and turning over operational control of the line to ISO-NE, which will operate the line under its Open Access Transmission Tariff (OATT).

The GSPL Project will satisfy the second factor and demonstrate no undue discrimination by its use of an open solicitation process and commitment to file the results of the open solicitation with FERC. The GSPL Project will demonstrate that it broadly solicited interest in the project from potential customers and also demonstrate that the solicitation, selection of customers, and negotiation of contracts with those customers met the criteria included in the *Policy Statement*. The GSPL Project will submit a report to FERC demonstrating that the process enabled the identification of transmission customers and execution of contractual arrangements in a manner consistent with FERC's *Policy Statement* and open access policies.

The GSPL Project will satisfy the third factor by demonstrating that the capacity allocations were not unduly discriminatory or preferential, and by turning over operational control of the project to ISO-NE.

The GSPL Project will satisfy the fourth factor by turning control over to ISO-NE and registering with the North American Electric Reliability Corporation as a Transmission Owner and Transmission Operator and complying with the applicable Reliability Standards.

No capacity on the line will be allocated other than through the FERC-approved process.

The precedent for approval of such negotiated rate authority includes the FERC *Policy Statement* on the use of open solicitations for the initial allocation of capacity over merchant transmission projects, *Policy Statement* at P 31, as well as the subsequent line of cases under which merchant transmission developers have sought and received negotiated rate authority, *see, e.g., Western Spirit*

Clean Line, 155 FERC ¶ 61,252 at PP 28-29; *Plains and Eastern Clean Line*, 148 FERC ¶ 61,122 at P 25; *Grain Belt Express Clean Line*, 147 FERC ¶ 61,098 at PP 19-22. FERC has previously granted negotiated rate authority to transmission developers whose solicitation of customers included participation in an RFP overseen by state agencies. See *Hudson Transmission Partners, LLC*, 135 FERC ¶ 61,104 (2011); *Conjunction*, 108 FERC ¶ 61,090 (2004).

Instead of a cost-based rate, under the FERC-approved negotiated rate authority process, the rate charged for transmission service will be as negotiated by the parties. For the GSPL Project, the negotiated rate will be supported by the pricing data as submitted in Section 14.2, the performance specification, and the requirements of the applicable OATT provisions for HVDC transmission lines. Other terms and conditions that are part of the negotiated rate for long term transmission capacity on the GSPL Project will be proposed through a Firm Transmission Capacity Purchase Agreement that will be modeled on the well-established basis of the Firm Transmission Capacity Purchase Agreements entered for other controllable HVDC projects in *Neptune Regional Transmission System*, 96 FERC ¶ 61,147 (2001) and *Hudson Transmission Partners*, 135 FERC ¶ 61,104 (2011). The proposed Firm Transmission Capacity Purchase Agreement (FTCPA) is provided in response to Section 15 and discussed in detail therein.

Transmission service on the GSPL Project will be taken in accordance with a schedule under the ISO-NE OATT, as is done with the Cross Sound Cable, Neptune, Hudson and other controllable lines, which complies with FERC's requirements under Section 205 of the FPA to have operating control vested in an independent system operator. See, e.g., ISO-NE OATT Schedule 18 MTF Service, see also PJM Tariff, Schedule 17 ("Hudson Transmission Service"); PJM Business Practices for Hudson Transmission Service.

Operation of the line will be regulated by the terms of the ISO-NE Interconnection Agreement for the GSPL Project, including the technical specifications for design and operation of the line. Finally, as required by ISO-NE, appropriate Transmission Operating Agreements will be executed.

Detailed provisions for the provision of ancillary services such as dynamic reactive power have been also been a part of such projects in ISO-NE. See Operating Protocol For and Compensation of the Cross Sound Cable for the Provision of Dynamic Reactive Power Support Under Schedule 2 to ISO-NE OATT.

The resale of the transmission capacity from the EDCs to the Clean Energy Generation supplier under the Firm Transmission Capacity Purchase Agreement for purposes of scheduling the Clean Energy Generation delivered to the EDCs will also need to be filed with FERC. The assignment will take place in accordance with the FTCPA provisions governing assignment of capacity as well as the ISO-NE OATT Schedule provisions on capacity reassignment. That filing will be submitted under Section 205 of the Federal Power Act and should therefore be filed more than 60 days prior to the first day of service over the GSPL Project.

RES Canada Wind Portfolio

Not applicable as the projects are located in Canada.

- 5.21 Describe and document any and all direct and indirect affiliations and affiliate relationships, financial or otherwise in the past three years between the bidder and one or more of the

Distribution Companies and their affiliates, including all relationships in which one of the Distribution Companies has a financial or voting interest (direct or indirect) in the bidder or the bidder's proposed project. These relationships include:

- Corporate or other joint arrangements, joint ventures, joint operations whether control exists or not;
- Minority ownership (50% or less investee);
- Joint development agreements;
- Operating segments that are consolidated as part of the financial reporting process;
- Related parties with common ownership;
- Credit, debenture, and financing arrangements, whether a convertible equity feature is present or not;
- Wholly owned subsidiaries; and
- Commercial (including real property) relationships with any Distribution Company.

GridAmerica

GridAmerica, Massachusetts Electric Company and the Nantucket Electric Company and their affiliates are indirect wholly-owned subsidiaries of National Grid plc as described herein.

The GSPL Project will be held by a new project-specific company to be set up as a direct wholly-owned subsidiary of GridAmerica. GridAmerica is a Delaware holding corporation set up to hold National Grid's electric transmission investments in the United States. It is a direct wholly-owned unregulated subsidiary of NGUSA. NGUSA is a public utility holding company with regulated subsidiaries engaged in the generation of electricity and the transmission, distribution and sale of both natural gas and electricity. NGUSA is a direct wholly-owned subsidiary of National Grid North America Inc. and an indirect wholly-owned subsidiary of National Grid plc, a public limited company incorporated under the laws of England and Wales.

NGUSA has two major lines of business, "gas distribution" and "electric services," and operates various services and investment companies. NGUSA's wholly-owned New England subsidiaries include, Massachusetts Electric Company and the Nantucket Electric Company. The other wholly-owned New England subsidiaries of NGUSA include New England Power Company, the Narragansett Electric Company, the Boston Gas Company, and the Colonial Gas Company. NGUSA's wholly-owned New York subsidiaries include Niagara Mohawk Power Corporation, National Grid Generation, LLC, the Brooklyn Union Gas Company, and the KeySpan Gas East Corporation. Under its holding company structure, NGUSA has no independent operations or source of income of its own and conducts all of its operations through its subsidiaries.

In the ordinary course of operations, GridAmerica's affiliates engage in commercial transactions and arrangements for services with Distribution Companies and their affiliates. GridAmerica or its affiliates have also entered into joint arrangements with Distribution Companies and their affiliates in the past three years.

RES Canada

[REDACTED]

SECTION 6 OF APPENDIX B TO THE RFP SITING, INTERCONNECTION, AND DELIVERABILITY

This section of the proposal addresses project location, siting, real property rights and interconnection issues. Bidders should ensure that the threshold criteria outlined in Section 2.2 of the RFP for generation, transmission proposals, and system upgrades are verified in their responses.

- 6.1 Provide a site plan including a map of the site that clearly identifies the location of the Eligible Facility site and/or Transmission Project route, the assumed right-of-way width, the total acreage for Eligible Facilities, the anticipated interconnection point (or, if applicable, multiple points for a Transmission Project), and the relationship of the site to other local infrastructure, including transmission facilities, roadways, and water sources. In addition to providing the required map, provide a site layout plan which illustrates the location of all major equipment and facilities on the site.

Site plan included? Yes ☒ No ☐ If not, please explain:

GSPL Project

To minimize project impacts and cost, GridAmerica is developing the proposed GSPL Project parallel to existing transmission corridors and upgrading existing transmission infrastructure. Figure 6.1.1 below presents an overview of the Project corridor in Vermont and New Hampshire, along with the locations of relevant substations and converters. For more detailed information, please refer to *Attachments 6.1.1-6.1.19 (confidential)- GSPL Transmission Route Maps*.

The GSPL Project includes an approximately 58-mile HVDC transmission line from the Norton converter station near the U.S./Canada border in Essex County, Vermont to a new converter station near the existing Comerford Substation in the town of Monroe, New Hampshire. The proposed HVDC line follows the right-of-way of the existing Phase I Quebec-New England HVDC Interconnection, which was built in the mid-1980's. The new GSPL Project HVDC Line will be installed on the east side of the existing Phase I Quebec-New England HVDC line within a new 150-foot wide right-of-way. Figure 6.1.2 below presents an overview of the GSPL Project's HVDC line corridor in Vermont and New Hampshire.

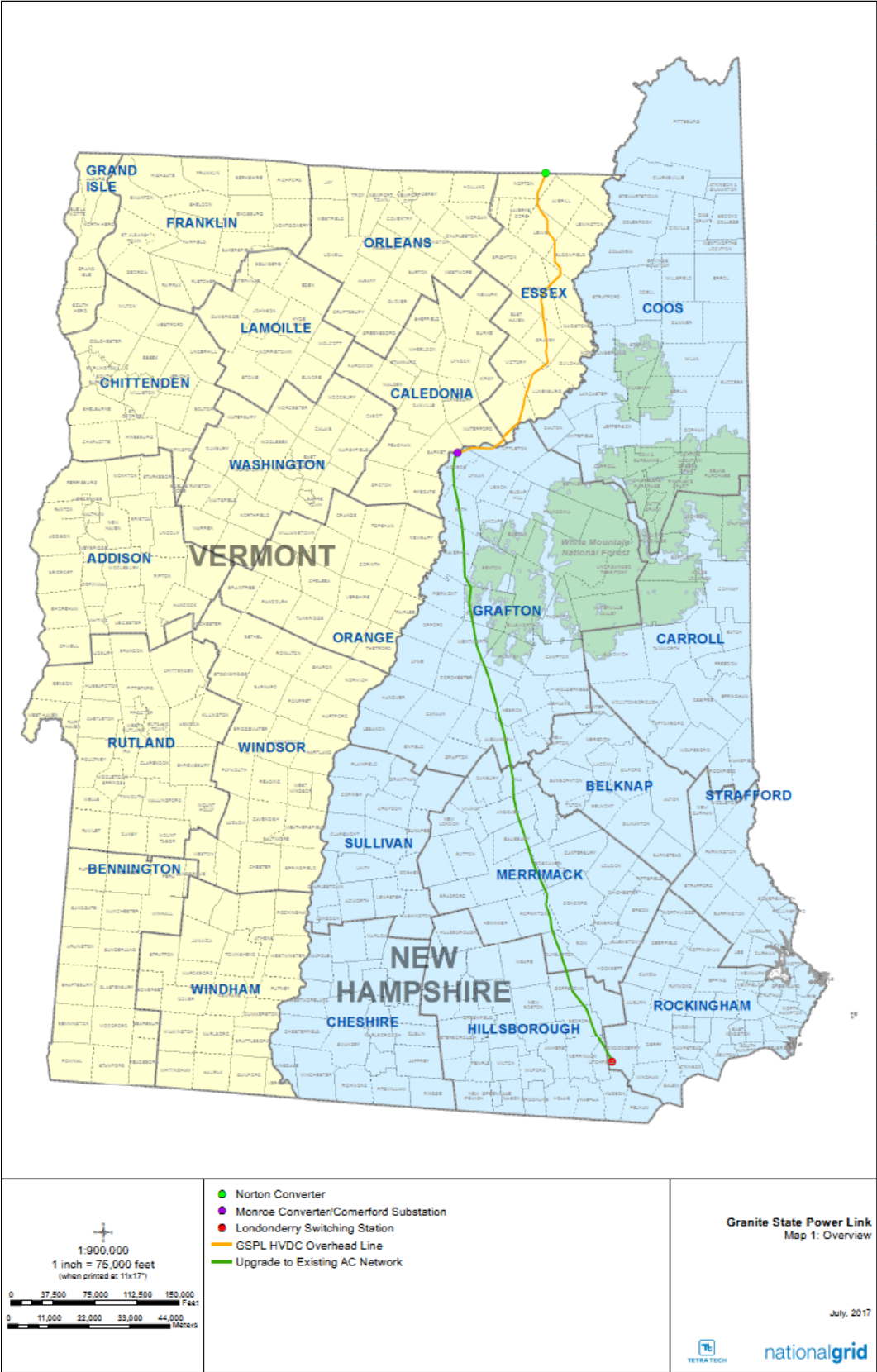


Figure 6.1.1 Overview of GSPL Project and Associated AC Upgrades Corridor

The proposed GSPL Project is located in an area of Vermont known as the Northeast Kingdom, which can be characterized as much less densely populated than the rest of the state. The Northeast Kingdom represents 21% of the Vermont land area but contains only 10% of the state's population. The general level of development along the proposed project route is illustrated by the limited number of roadways that traverse the area. Between the U.S./Canada border and the Connecticut River crossing, the proposed GSPL Project route crosses three major roadways: State Route 114, State Route 105, and U.S. Route 2. State Route 114 is crossed by the existing Phase I HVDC line right-of-way and the proposed GSPL Project route about 1 mile south of the U.S./Canada border. From that point the Phase I HVDC right-of-way and proposed GSPL Project route continue through undeveloped forest land for approximately 16.5 miles before crossing State Route 105. The next major road crossing at U.S. Route 2 is approximately 24.5 miles south of the State Route 105 crossing. There are no major road crossings for the last 10.4 miles in Vermont between the U.S. Route 2 crossing and the Connecticut River.

South of the Connecticut River crossing, in New Hampshire, the proposed GSPL Project right-of-way crosses State Route 18/135 and then Interstate 93, crossing State 135 again before reaching the proposed converter station site. The area traversed by the GSPL Project right-of-way in New Hampshire is a mix of forest land along the Connecticut River and some agricultural land.

The GSPL Project across Vermont (and including approximately 5.8 miles in New Hampshire) as described above would be 58 miles in length and 150 feet in width, equating to approximately 1,050 acres of land. Figure 6.1.2 below presents an overview of the project HVDC line corridor in Vermont and New Hampshire.

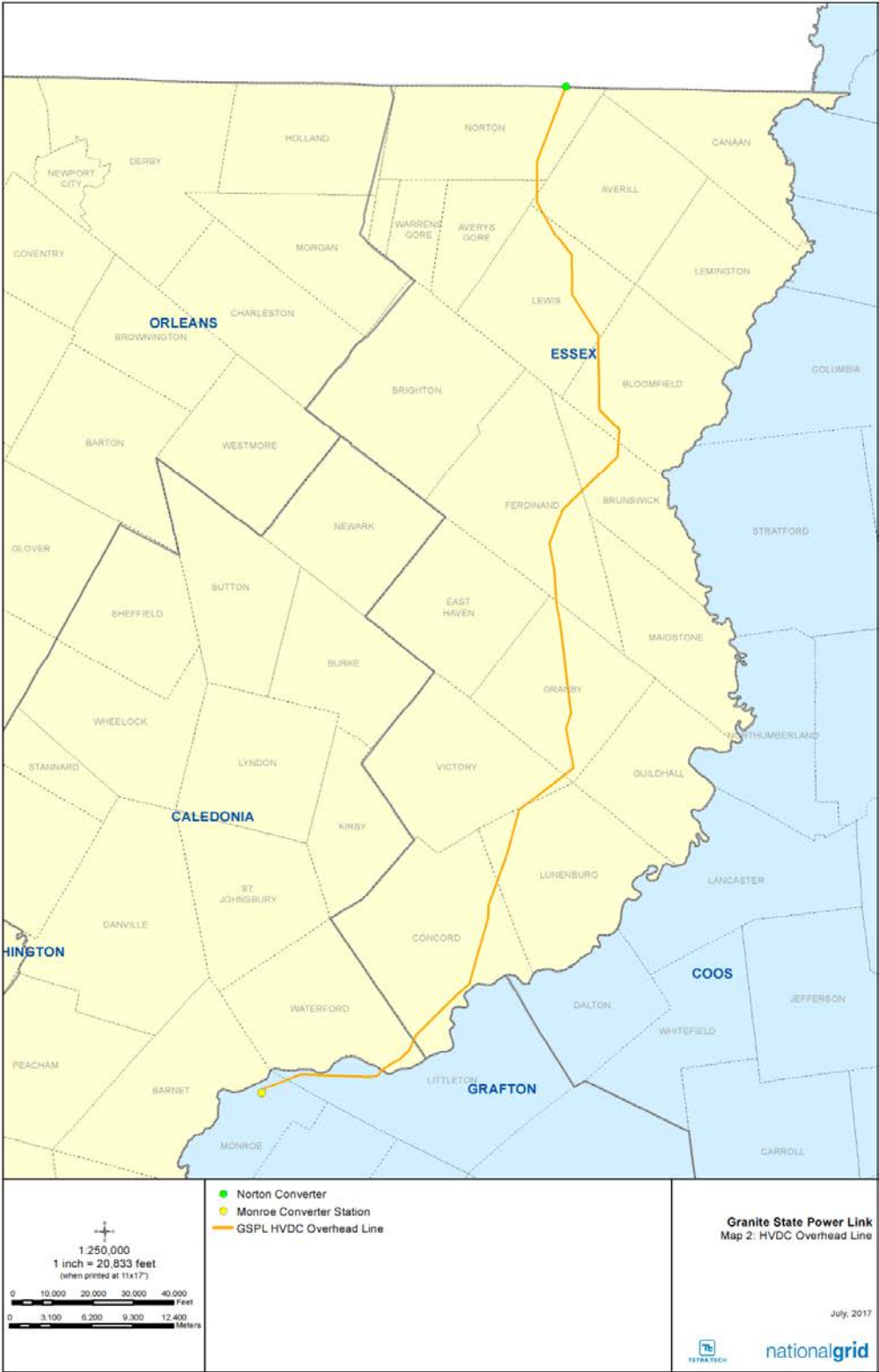


Figure 6.1.2 GSPL Project 58-Mile Route Through Vermont and New Hampshire

A unique benefit of the GSPL Project is that GSPL Project interconnects to the ISO-NE system in Monroe, New Hampshire, avoiding the need to construct new lines and new right-of-ways through

much of New Hampshire. The expected AC upgrade by New England Power (NEP) of approximately 108 miles of existing infrastructure will require right-of-way width expansion along only two miles of the existing right-of-way. The expected NEP-owned system upgrades, determined in accordance with ISO-NE Schedule 25, are described in *Attachment 6.7.1 (confidential) – Assessment of AC System Impacts*. Additional Eversource system upgrades are expected to be identified under the same process, all of which would be addressed upon completion of the SIS and are similarly anticipated to pose minimal impacts.

Detailed maps showing the entire length of the GSPL Project through Vermont and New Hampshire are provided as *Attachments 6.1.1-6.1.19 (confidential) - GSPL Transmission Route Maps*.

Mistissini Project

The Mistissini Project is a 201.6 MW wind energy project comprised of turbines, access roads, a medium-voltage collector system, a transforming substation, and an O&M building. It is strategically located on public lands, in the Eeyou Istchee James Bay region, near an existing dual 161 kV circuit operated by HQT, approximately 450km north of Quebec City. The project site is also over 15 miles from the nearest town, Mistissini, and hosts a limited amount of seasonal dwellings (cottages and hunting cabins).

The project area, showing a total acreage of 20,010 ha (49,446 acres), stretches on a North-South axis along the west shore of Lake Mistassini. It should be noted however that only a small fraction (see table below) will be used for the actual wind project operations. The project area is 6 miles from the Route du Nord which links Chibougamau to the road to James Bay.

The project will be interconnected to the HQT system by way of a projected 161-kV dual circuit transmission line (HQT gentie) that will be connected to the project substation. The HQT gen-tie will run for 13.7 km (8.51 miles) to the southwest to reach the expected POI on the existing HQT transmission system. A detailed Site Layout Plan showing the Eligible Facility Site equipment and facilities is provided as *Attachment 6.1.20 (Confidential) – Mistissini Site Layout Plan*.

The following table provides a list of the Project equipment and facilities, and their associated footprint (acreage) during operations.

Equipment/Facility	Amount	Estimated acres used (operations)
Wind turbines	56	8.4
Access roads w/collector system	47.3 miles	376.1
Collector system only	13.2 miles	26.1
Substation/O&M building	1	3

HQT gen-tie (Project substation to HQT transmission system – 161 kV)	8.5 miles	101.5
Permanent masts	4	9.9
Total		525.0 acres

The Project's power will travel through the HQT transmission system and to the HQT/GSPL Project point of interconnection

Vauban Project

The Vauban Project is a 298.8 MW wind energy project comprising turbines, access roads, a medium-voltage collector system and a substation and O&M building. It has been strategically located on public lands near existing high-voltage lines operated by HQT, approximately 150km north-east of Quebec City. The Project site is also over 3 miles from towns and villages, and only hosts a limited amount of seasonal dwellings (cottages and hunting cabins).

The anticipated point of interconnection to the existing HQT system will be located at the 315kV dual line in the northern portion of the Project area, approximately 19 km (1.2 miles) from the Project's substation. A detailed Site Layout Plan showing the Eligible Facility Site equipment and facilities is provided as *Attachment 6.1.21 (Confidential) – Vauban Site Layout Plan*.

The following table provides a list of the Project equipment and facilities, and their associated footprint (acreage) during operations.

Equipment/Facility	Amount	Estimated acres used (operations)
Wind turbines	83 WTG	8.3
Access roads w/collector system (30 m)	70.6 miles	748
Collector system only	13.3 miles	50.2
Substation/O&M building	1	3

HQT gen-tie (Project substation to HQT transmission system – 315 kV)	1.2 miles	24.4 acres
Masts	4	9.9
Total		843.8

The Project's power will travel through the HQT transmission system and to the HQT/GSPL Project point of interconnection.

6.2 Identify any real property rights (e.g., fee-owned parcels, rights-of-way, development rights or easements or leases) that provide the right to use the Eligible Facility site and/or Transmission Project route, including, for Eligible Facilities, and any rights of way needed for interconnection.

6.2.i *Does the project have a right to use the Eligible Facility site and/or Transmission Project route for the entire proposed term of the PPA or tariff (e.g., by virtue of ownership or land development rights obtained from the owner)?*

GSPL Project

Yes ☐ No ☒ If not, please explain:

The project team is actively pursuing land rights (or options to secure such rights), both fee and easement (depending on the parcel and its intended use), for as many as 57 (in Vermont) and 26 (in New Hampshire) parcels owned by private, governmental, utility and not-for-profit landowners, with some variation as to the number of parcels depending upon evolving project requirements. The linear rights to be acquired in Vermont adjoin Vermont Electric Company's existing right-of-way for the entire 53-mile length of the proposed transmission line in Vermont. Presently, VELCO is working with the GSPL Project to bring value to Vermont ratepayers through agreements that govern access to the VELCO ROW and information sharing. VELCO sees great short and long-term opportunities from the GSPL Project for Vermont's towns, residents, and businesses, and VELCO looks forward to working with GSPL Project to more fully develop and define these benefits to Vermont ratepayers. The linear rights to be acquired in New Hampshire (approximately 5.8 miles in total) adjoin NEP's existing right-of-way.

Mistissini Project

Yes ☒ No ☐ If not, please explain:

Vauban Project

Yes ☒ No ☐ If not, please explain:

- 6.2.ii. *If so, please detail the Bidder's rights to control the Eligible Facility site and/or Transmission Project route control.*

Mistissini Project

The Mistissini Project has obtained a Letter of Intent (LOI) from the Quebec Department of Energy and Natural Resources (*Ministère de l'Énergie et des Ressources naturelles, or MERN*). The LOI confirms that the provincial government, by way of the MERN, intends to offer appropriate land rights (*droits fonciers*) for the purposes of constructing and operating a wind energy project, should the Project be selected under a given solicitation such as the current Massachusetts RFP; it is the only document available to bidders in Quebec prior to having secured a power contract. Evidence of having obtained 100% of land development rights for the Project is provided in the LOI in *Attachment 6.2.1 (Confidential) – Mistissini Letter of Intent*. Note that the MERN provided a courtesy version of the LOI in English, which follows the French certified copy of the LOI.

Vauban Project

The Vauban Project has obtained a Letter of Intent (LOI) from the Quebec Department of Energy and Natural Resources (*Ministère de l'Énergie et des Ressources naturelles, or MERN*). The LOI confirms that the provincial government, by way of the MERN, intends to offer appropriate land rights (*droits fonciers*) for the purposes of constructing and operating a wind energy project, should the Project be selected under a given solicitation such as the current Massachusetts RFP; it is the only document available to bidders in Quebec prior to having secured a power contract. Evidence of having obtained 100% of land development rights for the Project is provided in the LOI in the LOI in *Attachment 6.2.2 (Confidential) – Vauban Letter of Intent*. Note that the MERN provided a courtesy version of the LOI in English, which is followed by the French certified copy of the LOI.

- 6.2.iii. *Describe the status of acquisition of real property rights, any options in place for the exercise of these rights and describe the plan for securing the necessary real property rights, including the proposed timeline. Include these plans and the timeline in the overall project timeline.*

GSPL Project

For the proposed converter stations, the GSPL Project has secured legal site control through a signed option agreement from a landowner in Monroe, New Hampshire to purchase or lease land on which to site the Monroe station. The second converter location is in Norton, Vermont and is on a parcel on the U.S./Canada border that is adjacent to the province of Quebec which is currently under negotiation. The property rights to be acquired by the GSPL Project are detailed in *Attachments 6.1.1-6.19 (confidential)- GSPL Transmission Route Maps*.

The GSPL Project property team brings extensive capability in acquiring real property rights to facilitate similar, large electric transmission projects in New England. GridAmerica's in-progress stakeholder engagement plan and significantly developed engineering has allowed us to identify and approach landowners during this early development stage. In addition to the GSPL Project

property team experience, VELCO is a trusted partner in the field of energy infrastructure development with a strong track record in protecting the environment and working with landowners, in which case, VELCO's involvement would be beneficial to the GSPL Project and to ratepayers. All such rights to the transmission line will be acquired prior to the start of construction, and the project team is planning to procure all such rights, either via option agreements or outright, by the end of this calendar year in accordance with the schedule provided in Section 10.1. The required land parcels and landowners are described below in this section and identified in detail in *Attachments (confidential) 6.1.1 – 6.1.19*.

The first 2.5 miles of the route span 13 parcels owned by 11 different private landowners in the town of Norton, Vermont.

After the 2.5 miles, South of Route 114, the right-of-way enters an area known as the Hancock Forest Legacy Easement lands. The Vermont Agency of Natural Resources (VANR), Department of Forests, Parks and Recreation (VDFPR) acquired the Hancock Deed of Conservation Easement in 1996 from the John Hancock Mutual Life Insurance Company with federal Forest Legacy funding. The Hancock Forest Legacy Easement covers over 31,000 acres of private forestland on two separate parcels. The existing HVDC right-of-way and the proposed GSPL Project right-of-way passes through the Hancock easement lands for a distance of approximately 2.7 miles. These lands are managed by Vermont agencies, and VELCO's involvement in the GSPL Project would establish a compelling permitting narrative for state agencies as VELCO collaborates with GridAmerica to more fully develop and define the significant economic benefits from the GSPL Project for the Northeast Kingdom towns and Vermont ratepayers.

From the Hancock easement lands the existing HVDC right-of-way and the proposed GSPL Project right-of-way enter two parcels of private timberlands for approximately 1.1 miles before entering lands that are part of the Kingdom Heritage Lands, which encompass approximately 132,000 acres that were acquired from Champion International in 1998. The Kingdom Heritage Lands include the Conte NFWR – Nulhegan Basin area (26,000 acres), (identified as Conte NFWR in Figure 6.2 below) the West Mountain Wildlife Management Area (WMA) (22,000 acres) (identified as VFWD – WMA in Figure 6.2), and various timberlands currently owned by the Plum Creek Timber Company (84,000 acres) (identified as Plum Creek Timber Company in Figure 6.2). The Vermont Land Trust (VLT) and the Vermont Housing and Conservation Board (VHCB) are co-holders of a conservation easement on the Plum Creek timberlands, and the VANR and the VHCB are co-holders of a public access easement on those timberlands. The existing HVDC right-of-way and the proposed GSPL Project right-of-way crosses the Plum Creek timberlands in three locations, the first location of which is a total distance of 2.6 miles. The Conte NFWR – Nulhegan Basin Conservation Focus Area (CFA) encompasses 26,605 acres and is managed by the U.S. Fish and Wildlife Service (FWS) for wildlife, ecological values and compatible public recreation. These federal lands are considered part of the Kingdom Heritage Lands and are not encumbered by any other easements. The existing HVDC right-of-way and the proposed GSPL Project right-of-way traverse the Nulhegan Basin CFA for a distance of 8.6 miles. GSPL Project then crosses four individual landowners for 0.8 miles before crossing the second and third Plum Creek timberlands locations for another 2.8 miles.

After the Plum Creek timberlands the GSPL Project spans a large parcel owned by the State of Vermont, Agency of Natural Resources, Fish and Wildlife Department for approximately 5.6 miles (identified as VDFPR – State Forest in Figure 6.2). The GSPL Project team has met with the VANR and corresponding agencies regarding these Vermont conservation easements (Hancock Easement,

Champion Lands, and WMA), and GridAmerica is working toward suitable and beneficial agreements, including mitigation measures, to use these lands for the delivery of clean energy resources. In addition, the GSPL Project team has met with the FWS regarding the Silvio Conte NFWR, and GridAmerica is progressing under a FWS-approved process to acquire these lands for the delivery of clean energy resources.

After the State of Vermont property, GSPL Project crosses another eight parcels of land for a length of seven miles, and then crosses another four properties owned by the State of Vermont that span

another five miles. The GSPL Project then crosses 18 parcels of land for 13.5 miles before it reaches the Connecticut River crossing from Vermont to New Hampshire.

South of the Connecticut River crossing, in New Hampshire, the proposed GSPL Project right-of-way crosses State Route 18/135 and then Interstate 93, crossing State 135 again before reaching the proposed converter station site. The area traversed by the GSPL Project right-of-way in New Hampshire is a mix of forest land along the Connecticut River and some agricultural land. These 5.8 miles in New Hampshire cross 26 separate parcels of land. As mentioned in Section 10.1 within the Project Schedule, site acquisition is anticipated to be completed by the end of 2017.

Mistissini Project

Real property rights required to build the Mistissini Project have been secured as per the LOI process (see above). RES Canada must meet the conditions of the LOI, which generally involve avoiding sensitive areas and conducting sufficient consultation, which are also required under the environmental process discussed below. Once the public lands reservation request application submitted, the MERN requires a 60-day period to review, evaluate and issue the land rights.

For the lands that are required for the HQT gen-tie, linking the Project's substation to the HQT system, the real property rights will be acquired by HQT, as part of the standard process for interconnecting new generation in Quebec. As detailed on the site plan mapping provided in this section, this line transects public land only, is within 15km of the POI, and runs along existing forestry access roads. HQT enjoys strong regulatory privileges to gain access to public lands.

Vauban Project

Real property rights required to build the Vauban Project have been secured as per the LOI process (see above). RES Canada must meet the conditions of the LOI, which generally involve avoiding sensitive areas and conducting sufficient consultation, which are also required under the environmental process discussed below. Once the public lands reservation request application submitted, the MERN requires a 60-day period to review, evaluate and issue the land rights.

For the lands that are required for the HQT gen-tie, linking the Project's substation to the HQT system, the real property rights will be acquired by HQT, as part of the standard process for interconnecting new generation in Quebec. As detailed on the site plan mapping provided in this section, this line transects public land only and is approximately 1.9 km (1.2 miles) of the proposed POI. HQT enjoys strong regulatory privileges to gain access to public lands; it should be noted as well that the 315 kV line, being under 2 km in length will benefit from a simplified approvals process.

6.2.iv. Identify any joint use of existing or proposed real property rights

Not applicable.

- 6.3 Provide evidence that the Eligible Facility site and/or Transmission Project route is properly zoned or permitted. If the Eligible Facility site and/or Transmission Project route is not currently zoned or permitted properly, identify present and required zoning and/or land use designations and permits and provide a permitting plan and timeline to secure the necessary approvals.

Detail the zoning and permitting issues:

GSPL Project

In Vermont, only seven of the 12 host towns have enacted zoning bylaws. In New Hampshire, the GSPL Project traverses two towns, and only the Town of Littleton has a zoning ordinance. The zoning of the NEP and Eversource upgrades is described in *Attachment 6.3 – AC Upgrade Preliminary Environmental Assessment*.

In both Vermont and New Hampshire, because the GSPL Project must be approved by each state's energy facility siting agency, the Project will not be subject to local zoning regulation. In Vermont, the GSPL Project will require a Certificate of Public Good from the Vermont Public Utility Commission (PUC) in accordance with Section 248 of the Public Service Law, (Section 248). The Commission's jurisdiction pursuant to this law preempts local zoning and permitting authority. Several Vermont towns recognize the preemptive effect of state regulation by expressly exempting "transmission facilities regulated under 30 V.S.A. § 248." See Unified Towns and Gores Zoning By-Law, § 311(a); Concord Zoning By-Law, § 208.1; and Granby Zoning By-Law, § 204.04(A).

Similarly in New Hampshire, the Site Evaluation Committee (SEC) has exclusive authority over the siting, construction and operation of energy facilities pursuant to Section 162-H of the New Hampshire statutes (Section 162-H), which preempts local regulation. Consequently, the GSPL Project, as well as any SEC-jurisdictional AC system upgrades would not be subject to local land use regulation and zoning.

Notwithstanding the preemption of local regulation, applicants seeking approval from the Vermont PUC and the New Hampshire SEC must still demonstrate that their proposed projects will not unduly interfere with the orderly development of the region. Assessment of this criterion requires that due consideration be given to the recommendations of municipal and regional planning commissions, the recommendations of municipal legislative bodies, and the land conservation measures contained in the plan of any affected municipality.

While the details of each regional and municipal plan are still under review, they typically establish goals and objectives aimed at promoting efficient and environmentally sound economic growth while encouraging needed development to occur in already developed areas in order to be consistent with existing land use patterns. The GSPL Project generally accomplishes these goals since the HVDC line will be located adjacent to an existing transmission corridor in rural, forested settings thereby minimizing impacts to local land use. Notably, certain plans are directly supportive of development like the project. For example, the Northeastern Vermont Development Association's 2015 Regional Plan adopted on August 22, 2015 (NVDA Plan) acknowledges that the Northeast Kingdom has roughly 325 miles of transmission and sub-transmission lines and serves as an important gateway for electricity coming from both Canada and New Hampshire. The NVDA Plan "support[s] the upgrade of regional transmission systems to continue to reduce constraints," "promote[s] a diversified energy portfolio for the region", and "assist[s] in the development of businesses that support alternative energy use." Another relevant energy goal states that

"environmental and aesthetic impacts of energy generation and usage will be considered." The proposed GSPL Project is consistent with and promotes these goals as it would provide necessary electrical support to meet the region's demands, facilitate the import of clean renewable energy and would be constructed adjacent to an existing ROW already populated with electric infrastructure, thereby lessening aesthetic impacts and enabling land conservation. Accordingly, the GSPL Project is consistent with the orderly development of the region and land conservation plans.

Permitting plan and timeline:

As discussed in Section 7.2, GridAmerica expects to file Vermont and New Hampshire permit applications in Q1 2018, and expects to receive all approvals by Q3 2019, a period of approximately 18 months.

Start Date: Q1 2018

End Date: Q3 2019

Mistissini Project

The Mistissini Project is located in the Eeyou Istchee James Bay region, north of the 49th parallel, in the *Nord-du-Québec* administrative region. These public or "Crown" lands are governed by the James Bay and Northern Quebec Agreement. As such, the Project area is considered to be on Cree territory, a territory equivalent to a Quebec Municipal Regional County (MRC) with regards to land use planning purposes. As a function of the agreement, the Crees have rights over these lands and they are involved in all land planning in this territory. As noted above, RES Canada enjoys the strong support and partnership of the Cree of Mistissini, which will facilitate and strengthen its environmental assessment and permitting process.

There is no specific guidance on wind energy in the *Nord-du-Québec* region, however the MERN by way of the LOI for this Project, and following consultation with relevant Cree authorities, has confirmed that the lands identified for this development are compatible with wind energy, as long as a set of conditions are met, such as assessing visual impacts, avoiding sensitive habitats and conducting wildlife surveys. The LOI conditions are standard and thus do not represent a risk to the Project or a "fatal flaw".

This confirms that the area is properly zoned for such a wind energy project. As for any other project in Quebec, thorough public consultation and environmental assessment will be required to comply with the conditions stated above, and obtain the necessary approvals.

In terms of permitting, a wind project of this size is required to submit an environmental impact study to the provincial government under the Environmental Quality Act (*Loi sur la qualité de l'environnement*), in order to obtain a Certificate of Authorization from the Environmental and Social Impact Review Committee (commonly known as COMEX), an independent body composed of members appointed by the government of Quebec and the Cree Nation. A project of this type and under this jurisdiction does not require a governmental decree, which can significantly reduce the approvals process timeline. RES Canada anticipates launching its environmental baseline studies in Q1 2018, filing its completed ESIA in Q4 2018, and receiving approval in Q2 2019. The Certificate of Authorization and all other approvals shall be issued by Q1 2021.

Start Date: Q1 2018

End Date: Q1 2021

Vauban Project

The MERN is the governmental body that provides zoning guidance for all uses on Quebec public lands. For wind energy in the *Bas-Saint-Laurent* administrative region, where the project is located, the MERN has established a “development plan for wind energy” (*Plan régional de développement du territoire public – volet éolien*), which provides detailed guidance on developing wind energy projects on its territory, by namely identifying compatible zones and exclusion zones (where wind energy is not permitted). The entire Project area is located on a compatible zone, and the Project will need to comply with a set of conditions, such as assessing visual impacts, avoiding sensitive habitats and conducting wildlife surveys. Further, by way of the LOI process, the MERN consulted with the MRCs that would host the project, and all have indicated wind energy was a permitted use on their respective territories, provided that the project would conform to their wind energy regulations. These local regulations are common in Quebec and mainly pertain to taking into account specific setback requirements; thus they do not represent a risk to the project or a “fatal flaw”.

This confirms that the area is properly zoned for such a wind energy project. It should be noted that several other wind projects are operating on such compatible zones in Quebec. As for any other project, thorough public consultation, First Nations consultation and an environmental assessment will be required to comply with the conditions stated above, and obtain the necessary approvals.

In terms of permitting, a wind project of this size is required to submit an environmental impact study to the provincial government under the Environmental Quality Act (*Loi sur la qualité de l'environnement*), in order to obtain a governmental decree allowing the project to proceed. RES Canada anticipates launching its environmental baseline studies in Q1 2018, filing its completed environmental assessment in Q1 2019, and receiving all approvals between Q3 2020 and Q1 2021.

Start Date: Q1 2018

End Date: Q1 2021

- 6.4 Provide a description of the area surrounding the Eligible Facility site and/or Transmission Project route, including a description of the local zoning, flood plain information, existing land use and setting (woodlands, grasslands, agriculture, other).

GSPL Project

a) GSPL Project

As mentioned previously, the GSPL Project is located in an area of Vermont known as the Northeast Kingdom, which can be characterized as less densely populated than other parts of the state. The Northeast Kingdom represents 21% of the Vermont land area but contains only 10% of the state's population. Three counties – Caledonia, Essex and Orleans – comprise the Northeast Kingdom and the proposed HVDC line in Vermont traverses Essex and Caledonia counties with approximately 86% of the proposed HVDC line located in Essex County. According to the Regional Plan for the Northeast Kingdom (2015), approximately 95% of Essex County and 83% of Caledonia County is forested, most of which is private timberland. Cropland and pasture represent only 2% and 7% of the land area in Essex and Caledonia counties, respectively.

A large portion of the proposed HVDC route crosses various conservation lands in Northeast Vermont, including the Silvio O. Conte National Fish and Wildlife Refuge – Nulhegan Basin Unit, the West Mountain Wildlife Management Area, and the Victory State Forest. Because the existing Phase I HVDC line was built before these conservation lands were established, the existing fee-owned right-of-way is not technically included as part of these conservation lands even though the conservation lands surround it.

The Project crosses from Vermont into New Hampshire via a crossing of the Connecticut River, which forms the state borders. South of the Connecticut River crossing, the HVDC right-of-way crosses State Route 18/135 and then Interstate-93, crossing State Route 135 again before reaching the proposed Monroe converter station site in Grafton County, New Hampshire. The area traversed by the HVDC right-of-way in New Hampshire is a mix of forest land, conservation lands along the Connecticut River and some agricultural land.

An analysis was conducted based on the 2011 National Land Cover Database to characterize the land use within 500 feet of the existing right-of-way for the HVDC project. The results, shown in Table 6.4.1, are consistent with the general overview provided above.

Table 6.4.1: Land Use and Cover Types within 500 Feet East of the Existing HVDC Right-of-way

NLCD 2011	Vermont				New Hampshire		Total HVDC	
	Essex County		Caledonia County		Grafton County		Acres	Percent
	Acres	Percent	Acres	Percent	Acres	Percent		
Barren	-	0.0%	0.2	0.2%	-	0.0%	0.2	0.0%
Developed	13.6	0.4%	0.8	0.6%	15.2	4.2%	29.6	0.8%
Forest	2,767.4	90.6%	103.3	82.6%	242.6	66.6%	3,113.3	87.9%
Herbaceous	4.2	0.1%	0.3	0.2%	0.1	0.0%	4.6	0.1%
Planted/Cultivated	3.3	0.1%	-	0.0%	50.2	13.8%	53.6	1.5%
Shrubland	184.3	6.0%	15.6	12.5%	47.0	12.9%	246.8	7.0%
Water	4.3	0.1%	2.4	1.9%	7.7	2.1%	14.4	0.4%
Wetlands	76.3	2.5%	2.5	2.0%	1.1	0.3%	80.0	2.3%
Unclassified	0.2	0.0%	-	0.0%	-	0.0%	0.2	0.0%
	3,053.5	100.0%	125.0	100.0%	364.0	100.0%	3,542.5	100.0%

Source: National Land Cover Database, 2011.

In Vermont, flood plain areas have been identified by the Federal Emergency Management Agency (FEMA) and also mapped by the State of Vermont Department of Environmental Conservation as State-wide River Corridors. The FEMA maps identify Special Flood Hazard Areas where inundation would occur during a 100-year flood; the River Corridors encompass the area of land surrounding a river that provides for the meandering, floodplain, and the riparian functions necessary to restore and maintain the naturally stable or least erosive form of a river. The FEMA maps are known as the Flood Insurance Rate Maps (FIRM) and are used in the National Flood Insurance Program (NFIP). In the Northeast Kingdom region, most of the FIRM maps are over 30 years old and are not generally available in a GIS format for mapping and analysis.

An analysis of the Vermont River Corridors identified 13 crossings (including the crossing of the Connecticut River into New Hampshire) by the proposed HVDC line in Vermont totaling 3,834 feet in width. Table 6.4.2 identifies the individual River Corridor crossings and the width of each crossing. In New Hampshire, the proposed HVDC line crosses two FEMA-mapped Zone A flood

hazard areas associated with the Connecticut River and Bill Little Brook. Wherever possible, the transmission line would span floodplains, and staging areas and roadways would avoid the floodplain area. If structures or temporary construction areas are required within the floodplain area, the GSPL Project would work to minimize potential impacts, and coordinate with municipalities to comply with local flood zone regulations.

Table 6.4.2: Vermont River Corridors Crossed by the GSPL Project HVDC line

River/Stream	Width of Corridor Crossing (feet)	Town
Averill Creek	310	Norton
Nulhegan River	300	Bloomfield
Paul Stream	478	Ferdinand
Madison Brook	275	Ferdinand
Fitch Brook	260	Granby
Stony Brook	368	Granby
Carr Brook	267	Lunenburg
Carr Brook	353	Concord
Carr Brook	306	Concord
Miles Stream	324	Concord
<no name>	253	Concord
Halls Brook	340	Concord
Connecticut River	Split VT&NH	Waterford, VT-Littleton, NH

Source: Vermont Agency of Natural Resources, State-wide River Corridors database, 2017.

Attachment 6.4 – Town Zoning for GSPL summarizes local zoning for the towns that are traversed by the GSPL Project, including whether the town has enacted a zoning bylaw and defined zoning districts. In Vermont, only seven of the 12 host towns have enacted zoning bylaws. In New Hampshire, the HVDC project traverses two towns and only the Town of Littleton has a zoning ordinance. As discussed in Section 6.3, local zoning regulation of the GSPL Project is pre-empted by state law in Vermont and New Hampshire.

b) Eversource and NEP Upgrades

A description of local zoning issues, flood plain information, and existing land use for areas surrounding the NEP and Eversource upgrades is provided in *Attachment 6.3 – AC Upgrade Preliminary Environmental Assessment*.

Mistissini Project

As described above, the project is located in the Eeyou Istchee James Bay Territory, in the *Nord-du Québec* administrative region that covers more than 50% of the province's territory. The Eeyou Istchee James Bay Territory extends from James Bay to the Otish Mountains on an area of 330,000 km². It includes three unconstituted localities, four towns and nine Cree communities and has a population of approximately 15,000 people. The largest community is Chibougamau with a population of 8,000 inhabitants. The project is located approximately 90 km (56 miles) north of Chibougamau, in the vicinity of Mistissini, a Cree community seated in the south-east corner of Lake Mistassini, the largest natural lake in Quebec.

The project is located in a remote, wooded area comprising watercourses, wetlands and lakes. According to data from Quebec Forest, Wildlife and Park Department (2014) (*Ministère des Forêts, de la Faune et des Parcs – MFFP*), wetlands cover 4.8% of the project area. It is anticipated that all of the project's infrastructure will avoid wetlands and other water features, except for some access road and collector system crossings. As per the Site Layout Plan provided as *Attachment 6.1.20 (confidential) – Mistissini Site Layout Plan*, two protected areas (*Refuge biologique*) are found on the Project area however these are avoided by the project. The project is not located on any conservation lands. Details on potential impacts and mitigation strategies to minimise impacts are presented in Section 7.3 – Preliminary Environmental Assessment.

The project is located in the Canadian Shield area with generally rolling topography which consists of spruce forest, lakes, bogs, and rock. The elevation of the land in the project area varies between 1,400 and 2,000 feet.

Vauban Project

As previously described, the Vauban Project is located on public lands in the Bas-Saint-Laurent Region, approximately 150km (42 miles) northeast of Quebec City, 8 km (5 miles) north of the town of Pohénégamook.

The project area falls within three different MRCs: the Kamouraska MRC (municipalities of Picard and Saint-Joseph-de-Kamouraska), Témiscouata MRC (municipalities of Pohénégamook and Saint-Athanase), and the Rivière-du-Loup MRC (municipality of Saint-Antonin).

The project area is located in the Appalachian ecoregion, made up in large part of the Appalachians Mountains. The bedrock is principally composed of sedimentary rock (sandstone, limestone, shale, and mudrock) and highly creased and uneven volcanic rock (basalt). The project site is primarily made up of slope deposit and alteration. These are typical surface deposits in the Appalachian Mountains and they should not represent a constraint for wind development. Due to the rugged topography, the hydrology of the project area is characterized by a dense network of rivers with strong flows and a series of small lakes or wetlands. The site is drained by three main watersheds:

the Rimouski watershed, the Upper Saint-John – Big Black Watershed, and the Lower St. Lawrence – Loup Watershed. The project is interspersed by wetlands, but as a general rule, these wetlands are located in lower elevation zones, where drainage is poor, and should not represent areas that would be optimal for turbine locations.

The majority of the project area is forested, consisting of a mix of coniferous and deciduous stands of various ages, with some patches at different stages of regeneration due to logging activities. A few small lakes and many watercourses and wetlands are also found within the project area. According to governmental sources, the project area contains designated areas (wildlife refuges, experimental forests and exceptional forest ecosystems), as well as other sensitive areas such as mature forests and potential habitats of legally protected species. There are no conservation lands on the project area.

The land in vicinity of the project area is primarily used for forestry. The project area is located in Forestry Unit Management (FMU) #011-51. The timber license holders for this FMU will be consulted in regard of planned forest harvesting activities and resource access road network. There is no agricultural land on the project area. The site does not include residential areas, however it is used for recreational activities (seasonal cottages, cycling paths, various trails, hunting and fishing).

The project's infrastructure will avoid all known designated areas. Wetlands and other water features will also be avoided, except for some access road and collector system crossings. Details on potential impacts and mitigation strategies to minimise impacts are presented in Section 7.3 – Preliminary Environmental Assessment.

Zoning details, as they pertain to wind energy production, are presented in Section 6.3 above.

- 6.5 For Eligible Facilities, describe and provide a map of the proposed interconnection that includes the path from the generation site to the ISO New England Inc. ("ISO-NE") Pool Transmission Facilities ("PTF"). Describe how the bidder plans to gain interconnection path site control.

GSPL Project

Interconnection map included? Yes: ☒ No: ☐ if not, please explain:

Please refer to *Attachment 6.1.19 (confidential) – GSPL Transmission Route* for a full map illustrating the proposed interconnect location, and the response for the Transmission Project in Sections 6.1 and 6.4 above.

Interconnection site control plan:

Please refer to Section 6.1 for a full description of the complete GSPL Project, which proposes to interconnect at the Comerford Substation in Monroe, New Hampshire. GSPL Project is an Elective Transmission Upgrade (ETU) and its facilities and route as detailed in Section 6.1 includes the path from generation to the ISO-NE PTF. As mentioned in Section 6.1, the GSPL Project includes a HVDC transmission line from the U.S./Canada border in Essex County, Vermont to a new converter station near the existing Comerford Substation in the town of Monroe, New Hampshire, which is the

location of the ISO-NE proposed interconnection. Please refer to *Attachment 6.1.19 (confidential) – GSPL Transmission Route* for a full map illustrating the proposed interconnect location.

RES Canada Wind Portfolio

Please refer to Section 6.1 for a description of the projects' proposed interconnection scenarios with the HQT system, including maps found in *Attachments 6.1.20 (confidential) – Mistissini Site Layout Plan* and *Attachment 6.1.21 (confidential) – Vauban Site Layout Plan* showing anticipated HQT gentle routes connecting the projects to the existing HQT grid. Real-property rights associated with these interconnection line routes are discussed in Section 6.2iii.

Given that the projects' transmission paths will involve various components and lines within the HQT system, and no single path can adequately describe the flow of energy from the project busbar to the GSPL Project point of receipt, no map of the transmission paths through the province of Quebec is provided.

- 6.6 Please describe the status of any planned interconnection to the grid. Has the bidder made a valid interconnection request to ISO-NE, the applicable New England Transmission Owner, or any neighboring control areas, to interconnect at the Capacity Capability Interconnection Standard? Have any studies been completed by ISO-NE or the applicable Transmission or Distribution Owner? If multiple interconnection requests have been made, please specify all such active requests which have not been superseded by subsequent requests and information regarding the status of each. Provide copies of any requests made and studies completed. Describe how such studies and information support the costs assumed in preparing your bid and the associated timeline proposed.

GSPL Project

New England Interconnection Request

GridAmerica has made a valid interconnection request to ISO-NE (see *Attachment 6.6.1 (confidential) - ISO-NE Interconnect Request 627*). ISO-NE is presently conducting a Feasibility Study for the project expected to be complete in early August of this year. Due to time constraints, ISO-NE has not yet begun a Capacity Capability (PP-10) study for the project. In its place, GridAmerica has commissioned its own study to assess the capacity deliverability capability of the project. This study assesses deliverability of capacity from the 1,200 MW Granite State Power Link ETU: ISO-NE Interconnection Request Queue Position 627, with a synchronization date of 10/01/2022 and an in-service date of 12/31/2022. This study assesses the ability to deliver capacity from the proposed GSPL Project in conformance with applicable criteria in ISO New England Planning Procedure 10 (PP10): Planning Procedure to Support the Forward Capacity Market, and is functionally equivalent to studies that will be performed by ISO-NE for the stated purpose.

GridAmerica also contracted Energy Initiatives Group (EIG) to conduct an independent system impact study (SIS) for the GSPL Project. Given the RFP objectives of bringing 9.45 TWh of clean power to the Commonwealth, GridAmerica is aware of alternative transmission projects aiming to provide clean energy to Massachusetts. To reduce the number of scenarios modelled, EIG approached its economic and power studies through a critical assessment of these alternate

transmission projects. The “preferred scenario” reflects the view that given current and expected procurement volumes and market conditions, it is not credible to expect Granite State Power Link and another large, competing project to proceed to construction and commercial operation. EIG therefore modelled based on the assumption of GSPL Project advancing. This study is functionally equivalent to the SIS that will be performed by ISO-NE for the purpose of obtaining NEPOOL I.3.9 approval.

Please refer to GridAmerica’s response in Section 6.8, Section 6.12 and Section 6.15 for further information on the studies completed, and corresponding AC network upgrades required to support the interconnection of the project’s capacity in accordance with applicable ISO-NE planning procedures and criteria. The cost and schedule associated with these AC network upgrades have been factored into this proposal.

Hydro-Québec TransÉnergie Transmission Service Request

GridAmerica has submitted a long-term point-to-point transmission service request for the GSPL Project with HQT as the ETU project is proposed as a new HVDC based link between Quebec and New England. The System Impact Study Agreement for this request was fully executed on April 21, 2017. A copy of the interconnection request is included as *Attachment 6.6.2 (confidential) - Hydro Quebec Interconnection Request*. No system study results are available at the time of this proposal; however, as part of the transmission service request, HQT and GridAmerica are collaboratively assessing interconnection options.

GridAmerica has developed a technical solution for the GSPL Project that is flexible and able to accommodate a change in interconnection design from HQT. The design presented in this proposal allows for a single new-build 315kV circuit coming from the Des Cantons area and connecting to Norton AC 315kV substation on the US side of the border. This design is the most onerous power system scenario as HQT has informed us it includes the Northern Pass project in the pre-project case.

If the interconnection queue position changes and Northern Pass were to terminate their interconnection application agreement, it is likely that GSPL Project will be able to connect at Des Cantons 230kV AC substation with a new-build 230kV AC overhead line utilizing the existing right-of-way. The Norton AC substation has been sited so that it can accommodate a substation extension to allow for a 230kV double circuit line from Des Cantons. GridAmerica is proceeding with the development of both of these options in parallel to mitigate program risk.

GridAmerica and RES Canada are also holding joint collaborative meetings with HQT to ensure a joined-up, efficient transmission solution is achieved from the generator to the HQT transmission system.

Mistissini Project

As discussed in Section 4.2, in order to connect the Mistissini Project to the HQT system, RES Canada will file an interconnection request with HQT according to their interconnection process (*Demande de Raccordement de Centrale*). RES Canada has initiated this process by filing preliminary interconnection study requests with HQT for its Mistissini Project. The result of this study is included as *Attachment 4.2.1 (confidential) – Mistissini Preliminary Interconnection Study Results*

(French only). The results of this study are summarized below and a courtesy translation can be provided if required.

The Mistissini Preliminary Interconnection Study Request results, which have been supported by independent analysis, concludes that the Mistissini Project can connect to the existing L1625 161kV transmission circuit on the HQT transmission system, approximately 56km north of the Obalski substation. The project site plan mapping in Section 6.1 shows the interconnection route between the Mistissini Project substation and this Point of Interconnection (POI).

The results of the study also outline interconnection and system upgrade costs, supported by independent analysis, that have been considered by RES Canada in its financial modeling and project energy pricing. They also note the anticipated date of interconnection (the “MSTI” date) by HQT, which is specified as July 1, 2021, well in advance of the proposed contract term COD date.

Vauban Project

As discussed in Section 4.2, in order to connect the Vauban Project to the HQT system, RES Canada will file an interconnection request with HQT according to their interconnection process (*Demande de Raccordement de Centrale*). RES Canada has initiated this process by filing preliminary interconnection study requests with HQT for its Vauban Project. The result of this study is included as *Attachment 4.2.2 (confidential) – Vauban Preliminary Interconnection Study Results* (French only). The results of this study are summarized below and a courtesy translation can be provided if required.

The Vauban Preliminary Interconnection Study Request results, which have been supported by independent analysis, concludes that the Vauban Project can connect to the existing 315kV circuits 3084 and 3085 in between the Riviere-du-Loup and Madawaska substations. The double-circuit interconnection for this project would be at around 1.9 km from the project substation. The project site plan mapping in Section 6.1 shows the interconnection route between the Vauban Project substation and this Point of Interconnection (POI).

The results of the study also outline interconnection and system upgrade costs, supported by independent analysis, that have been considered by RES Canada in its financial modelling and project energy pricing. They also note the anticipated date of interconnection (the “MSTI” date) by HQT, which is specified as November 2022, in advance of the proposed contract term COD. RES Canada would work with HQT to improve this interconnection date, which is normally estimated in a conservative manner by HQT at this stage of study.

- 6.7 Describe the Project’s electrical system performance and its impact to the reliability of the New England Transmission system. For Transmission Projects provide a description of how the project would satisfy ISO NE’s I.3.9 requirements. Provide the status of any interconnection studies already underway with ISO-NE and/or the transmission owner. Provide a copy of any studies completed to date. Provide a copy of an interconnection agreement, if any, executed by the bidder with respect to the proposed project. If an interconnection agreement has not been executed, please provide the steps that need to be completed before an interconnection agreement can be executed and the associated timeline.

Performance and its impact:

Please see below in this section.

Attachments:

Copy of completed studies attached: ☐ If none, please explain:

Please see below in this section.

Copy of Interconnection Agreement attached: ☐ If none, please explain:

Status of Interconnection Studies

Granite State Power Link elected to begin the ISO-NE interconnection study process by requesting a Feasibility Study (FS). An Elective Transmission Upgrade (ETU) FS agreement with ISO-NE was entered into on March 13, 2017. The FS report is expected to be available in August 2017. No other studies have been either started or completed by ISO-NE as part of the ISO-NE interconnection approval process. Therefore, neither ISO-NE studies nor Interconnection Agreements are attached to this bid.

GridAmerica has conducted its own independent system studies that follow the principles of the ISO-NE interconnection processes, including:

1. System Impact Study (SIS) in accordance with the ISO-NE Network Capability Interconnection Standard (NCIS) – refer to *Attachment 6.7.1 (confidential) – Assessment of AC System Impacts*
2. Overlapping Capacity Deliverability Study in accordance with the ISO-NE PP-10, Capacity Capability Interconnection Standard (CCIS) – refer to *Attachment 6.7.2 (confidential) - Overlapping Impact Assessment of Capacity Deliverability*
3. Transfer Analysis – refer to Section 5.0 of the CCIS report

Project's electrical system performance

The GSPL Project will be engineered, designed and implemented to fully comply with ISO-NE requirements such that the project together with AC network upgrades will not have any adverse impact on the reliability or operability of the New England transmission system or the systems of any affected entities.

The selected point of interconnection for the GSPL Project in Monroe, New Hampshire, together with the network upgrades identified in the system studies will allow energy and capacity to be reliably delivered from clean energy resources located in the HQT transmission system to the ISO-NE region over a fully controllable HVDC link.

Also, the GSPL Project, along with associated AC system upgrades, will increase north to south thermal transmission capacity by 650 to 900 MW as compared to pre-GSPL Project limits. Please see the response to question 3.3 for other details on how GSPL Project will improve the reliability of the ISO-NE transmission system.

Steps required to execute an interconnection agreement

The GSPL Project will fully satisfy the requirements of ETU Schedule 25 of ISO-NE's tariff.

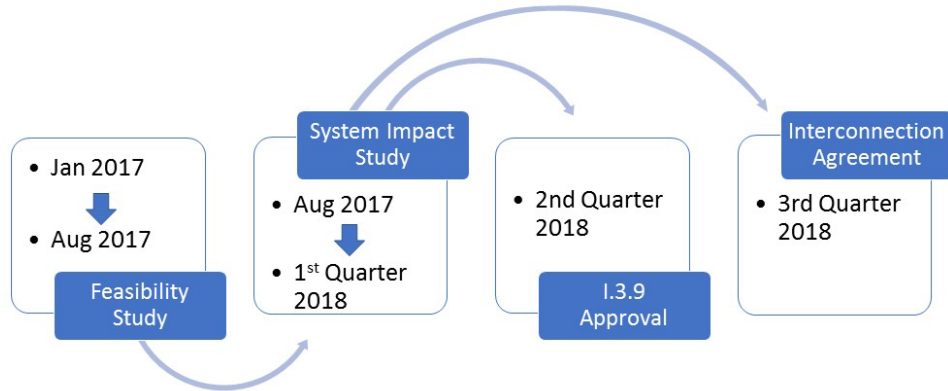
GridAmerica has already begun the ISO-NE interconnection approval process by first requesting a

FS. The interconnection approval process steps are listed below along with an anticipated completion date for each.

- **Feasibility Study** The FS is expected to be completed in August 2017.
- **System Impact Study** The SIS will demonstrate that the GSPL Project, together with any identified required network upgrades, does not harm the reliability or operability of the ISO-NE transmission system. The SIS will be performed by a consultant designated by ISO-NE in accordance with applicable ISO-NE planning procedures, criteria, and guidelines. As part of the interconnection approval process, the GSPL Project's SIS will undergo a peer review by participants from various Transmission Owners within the ISO-NE control area. The final SIS report will be issued to GridAmerica and this is anticipated to take place in the first quarter of 2018. The SIS will include planning grade estimates for interconnection facilities and network upgrade facilities associated with reliable interconnection of the GSPL Project.
- **Facilities Study** Upon acceptance of the findings in the GSPL Project's SIS, GridAmerica will have the option to proceed with a Project Facilities Study by entering into an Interconnection Facilities Study Agreement, or waive the rights to a Facilities Study and move directly into the ETU Interconnection Agreement.
- The Facilities Study will provide further details, refined cost estimates, and project schedules for those interconnection and network upgrades identified in the SIS. This information will be included within the ETU Interconnection Agreement. If elected by the GSPL Project, it is anticipated that the Facilities Study will begin in the second quarter of 2018.
- GridAmerica may elect to waive the Facilities Study phase and move directly to an ETU Interconnection Agreement (IA). Refined cost estimates for required transmission upgrades will be provided by the Transmission Owner(s) in accordance with the negotiated provisions of the ETU IA.
- **ETU Interconnection Agreement** GridAmerica will enter into an Interconnection Agreement applicable to its ETU Interconnection Request per the form that is included in Schedule 25 to Section II of the ISO-NE Tariff. It is anticipated that GridAmerica will enter into a four-party ETU IA with ISO-NE, National Grid, and Eversource in the third quarter of 2018.
- **I.3.9 Approval** The GSPL Project will fully comply with the requirements of Section I.3.9 of ISO-NE's tariff. After GridAmerica's review and acceptance of the ISO-NE SIS for the GSPL Project, GridAmerica will submit required Project Plan Applications for approval by the NEPOOL Reliability Committee in accordance with Section I.3.9 of the ISO-NE Tariff. Correspondingly, any transmission upgrades identified in the SIS to support the reliable interconnection of the GSPL Project will be submitted for approval by the appropriate Transmission Owner as part of the I.3.9 approval process. It is anticipated that I.3.9 approval will take place in the second quarter of 2018.

Timeline

The figure below presents the timeline to complete the expected steps toward interconnection.



Granite State Power Link
Expected ISO-NE Interconnection Approval Timeline

RES Canada Wind Portfolio

Please refer to Section 4.2 for the status of the interconnection studies relating to the RES Canada Wind Portfolio.

- 6.8 Projects that do not have I.3.9 approval from ISO-NE must include technical reports or system impact studies that approximate the ISO-NE interconnection process, including but not limited to clear documentation of study technical and cost assumptions, reasoning, and justification of such assumptions. All studies must assume the project will interconnect using the Capacity Capability Interconnection Standard, must use the current ISO-NE interconnection process (including network impact scenarios from multiple projects interconnecting), and must also detail any assumptions with respect to projects ahead of the proposed project in the ISO-NE interconnection queue and any assumptions as to changes to the transmission system that differ from the current ISO-NE Regional System Plan. Please include a scenario analysis that shows how changes in the project interconnection queue could impact interconnection costs.

Projects Ahead in the ISO-NE Interconnection Queue

GridAmerica considered the following projects that are ahead of the GSPL Project (QP-627) in the ISO-NE interconnection queue, as relevant to the GSPL Project:

Queue Pos.	Name	Unit	Fuel Type	Net MW	Summer MW	State	Interconnection Location
390	Spruce Ridge Wind Farm	WT	WND	50	50	NH	A-201 230kV line, Grafton NH
481	GRE Capacity Uprate	CC	NG	41	762	NH	Watts Brook, North Litchfield
484	Newington Gas Turbine Uprate	CC	NG	28	596	NH	Public Service New Hampshire Newington Switchyard - Gosling Road, Newington, NH
499	Northern Pass	N/A	N/A	1,090	1,090	NH	HQ Des Cantons substation to PSNH Deerfield substation
501	TDI New England	N/A	N/A	1,000	1,000	NH	HQ 735kV substation to VELCO 345kV Coolidge substation
543	wind	WT	WND	28	28	NH	Proposed POI is to PSNH 115kV line L163.
545	Proctor Hydroelectric Station Uprate	HD	WAT	3	10	VT	GMP Proctor Substation 46kV Circuit Breaker BB8
562	Solar	PV	SUN	20	20	VT	VEC Irasburg H16 46kV line
568	Solar	PV	SUN	10	10	NH	Unitil 34.5kV W. Port. St. sub
599	Solar	PV	SUN	65	65	NH	NGRID 115kV line from Vernon road tap to the Vernon Road Substation
602	Hydro Uprate	HW	WAT	5	196	NH	NGRID at Moore power station switchyard 230kV
603	Essential Power Newington CNRC Increase	CC	DFO NG	0	596	NH	Public Service New Hampshire Newington Switchyard - Gosling Road, Newington, NH
606	Huntington Falls 2017 Upgrades	HD	WAT	2	7	VT	GMP Huntington Falls Substation 46kV Circuit Breaker BB-10

*QP-390 has been withdrawn from the ISO-NE Study Queue

“Preferred” Scenario GridAmerica has elected to disregard QP499 and QP501 in its preferred project scenario because it is unlikely that more than one major (1000 MW+) ETU will ultimately move forward and become commercially viable. This scenario reflects the view that it is unrealistic to expect Granite State Power Link, Northern Pass, and TDI New England Clean Power Link to all

proceed to construction, and that only one of these three projects will be selected in the bid process. All other relevant queued resources ahead of the GSPL Project in the ISO-NE Interconnection study queue were assumed in-service for this scenario.

Additional assumptions included in the Preferred Scenario are as follows:

- Interconnection of existing Granite Ridge Generation (CT1 and CT2) radially into Tewksbury substation via existing 230kV lines south of new Londonderry station, and new Double Circuit Tower 230kV line between North Litchfield station and Londonderry station.

“Base” Scenario: For this scenario, all relevant queued resources ahead of the GSPL Project in the ISO-NE Interconnection study queue were assumed in-service, including Northern Pass, and TDI New England Clean Power Link.

Additionally:

- The existing Granite Ridge Generation (CT1 and CT2) was connected directly into the new Londonderry station via 345-230kV autotransformers at Londonderry, and a new Double Circuit Tower 230kV line between North Litchfield station and Londonderry station. This would require five 345kV bays at Londonderry, which would require the substation be built with Gas Insulated Switchgear (GIS). The existing 230kV lines between Londonderry and Tewksbury would be removed.

Transmission Upgrades Required:

For both scenarios, the transmission system upgrades identified to deliver 1200 MW of capacity from the project to the New Hampshire load zone are identical:

[REDACTED]

Note that the Beebe River – Huckins Hill (Z180) and Ashland – Pemigewasset (E115-2) line sections have already been identified by ISO-NE as existing system reliability needs in the New Hampshire 2023 Solutions Study, and most likely would not be the responsibility of the GSPL Project.

- 6.9 To the extent that you provide an alternative interconnection scenario based on ISO-proposed interconnection process changes, you must also include studies using the proposed ISO-NE-proposed process. Any such studies must be accompanied with clear documentation of study technical and cost assumptions, reasoning, and justification of such assumptions.

Not applicable, as GridAmerica is not proposing an alternative interconnection scenario based on any ISO-NE proposed interconnection process changes.

- 6.10 Provide the electrical models of all energy resources supporting the proposed project in accordance with the filing requirements of the ISO-NE Tariff Schedule 22 and 23.

Electrical models attached: ☐ If none, please explain:

Please refer to Section 6.13 for the PSSE IDV, which models the GSPL Project for power flow analysis, along with the anticipated NEP upgrades.

Models corresponding to resources that will deliver energy and capacity over the GSPL Project are not provided. These resources will be located within the HQT transmission network, consequently, their models are not essential for study of the New England transmission system.

- 6.11 Provide a copy of an electrical one-line diagram showing the interconnection facilities and the relevant facilities of the transmission and/or distribution provider.

Electrical one-line diagram attached: ☒ If none, please explain:

The one-line diagram for the “Preferred Scenario” as described in Section 6.8 is provided as *Attachment 6.11.1 (confidential) – GSPL One-line Diagram*.

The one-line diagram for the “Base Scenario” as described in Section 6.8 is provided as *Attachment 6.11.1 (confidential) – GSPL One-line Diagram*.

The one-line diagram for the Mistissini Project is included as *Attachment 6.11.2 (confidential) – Mistissini One Line Diagram*.

The one-line diagram for the Vauban Project is included as *Attachment 6.11.3 (confidential) – Vauban One Line Diagram*.

- 6.12 Specify and describe the current or new interconnection facilities (lines, transformers, switching equipment, system control protection, etc.) that bidder owns or is intending to construct or have constructed in order to deliver the proposed energy.

For either the Preferred or Base Scenarios, GridAmerica plans to construct the following new facilities to deliver the proposed energy:

- Construction of new 1200 MW Voltage Source Converter (VSC) Stations in Norton, Vermont and Monroe, New Hampshire, and construction of a new overhead 400kV HVDC transmission line between the two converter stations.
- Conversion of the existing A-201 and B-202 230kV transmission lines to 345kV between Comerford substation in northern New Hampshire and a new Londonderry substation in southern New Hampshire.

Construction of a new Comerford 345/230kV substation in Monroe, New Hampshire. This substation will be a breaker-and-a-half configuration terminating the HVDC line, [REDACTED] (10% impedance on OA cooling base) connecting to the existing 230kV substation, and the two 345kV lines that will terminate at the new 345kV breaker-and-a-half substation in Londonderry, New Hampshire.

Construction of a new 345kV substation in Londonderry, New Hampshire. This substation will be constructed in a breaker-and-a-half configuration. The Scobie Pond – Sandy Pond (326), Scobie Pond – Eagle (380), and Scobie Pond – Tewksbury (3124) 345kV lines will looped into the substation³. Construction of a new 345/230kV substation in Dunbarton, New Hampshire. This substation will consist of one [REDACTED] (10% impedance on OA cooling base) with a single 345kV circuit breaker connected to the B-202 345kV line, and will supply the existing Dunbarton 230kV tap line to Merrimack.

- Construction of a new 230kV Double Circuit Tower line between North Litchfield station and the new Londonderry station. In the Preferred Scenario, these two lines will bypass the Londonderry station and interconnect Granite Ridge G1 and G2 radially to the Tewksbury 230kV station. In the Base Scenario, the lines will interconnect Granite Ridge G1 and G2 to the new Londonderry station, via two 345-230kV autotransformers.

In addition, the following AC network upgrades may be needed to support the delivery of 1200 MW of capacity from the GSPL Project in conformance with ISO New England Planning Procedure 10 (PP10):

[REDACTED]

Note that the Beebe River – Huckins Hill (Z180) and Ashland – Pemigewasset (E115-2) line sections have already been identified by ISO-NE as existing system reliability needs in the New Hampshire 2023 Solutions Study and most likely would not be the responsibility of the GSPL Project.

6.13 Incremental data requirements for Projects that include Transmission facilities;

1. IDV file(s) in PSSE v32 format modeling only the new/modified Transmission components of the project: ■ If none, please explain:

A PSSE IDV file is attached as *Attachment 6.13 (confidential) – GridAmerica PSSE IDV file* to add the steady-state representation of Granite State Power Link, as well as the following upgrades to the National Grid Transmission System in New Hampshire:

- Conversion of the existing A-201 and B-202 230kV transmission lines to 345kV between Comerford substation in northern New Hampshire and a new Londonderry substation in southern New Hampshire.

³ For the Base Scenario, the Londonderry substation would also include a 5th bay which would accommodate the two 230kV lines from N Litchfield, along with two 345-230kV autotransformers.

- Construction of a new Comerford 345/230kV substation in Monroe, New Hampshire. This substation will be a breaker-and-a-half configuration terminating the HVDC line, two [REDACTED] (10% impedance on OA cooling base) connecting to the existing 230kV substation, and the two 345kV lines that will terminate at the new 345kV breaker-and-a-half substation in Londonderry, New Hampshire.
- Construction of a new 345kV substation in Londonderry, New Hampshire. This substation will be constructed in a breaker-and-a-half configuration. The Scobie Pond – Sandy Pond (326), Scobie Pond – Eagle (380), and Scobie Pond – Tewksbury (3124) 345kV lines will looped into the substation.
- Construction of a new 345/230kV substation in Dunbarton, New Hampshire. [REDACTED] (10% impedance on OA cooling base) with a single 345kV circuit breaker connected to the B-202 345kV line, and will supply the existing Dunbarton 230kV tap line to Merrimack.

A PSSE stability model is being developed for the HVDC component of the GSPL Project, and this model can be provided subsequently when the ISO-NE initiates its System Impact Study.

If the Bidder does not use PSSE, provide in text format necessary modeling data as follows:

Not applicable.

-

- 6.14 Please detail with supporting information and studies (as available) that the energy contemplated in your proposal is able to be delivered to the Distribution Companies without material constraint or curtailment.

GridAmerica has conducted an *Overlapping Impact Assessment of Capacity Deliverability* study, provided as Attachment 6.7.2 (confidential). The study identifies the AC network upgrades necessary to ensure the full dispatch of the GSPL Project's capacity in accordance with ISO-NE PP10. Please refer to Section 6.12 for corresponding AC network upgrades.

In addition, the study presents the transfer analysis of the GSPL Project's output at the point-of-interconnection in northern New Hampshire, to various locations to the south including:

- Southern New England
- Southeastern Massachusetts Load Zone (SEMA), and
- Boston

In summary, the results show that the GSPL Project, together with corresponding NEP and Eversource AC network upgrades and topology changes, increases the available transmission capacity across the New England north to south interface by approximately 650 to 900 MW, depending on the dispatch of imports from the HVDC Phase II converter at Sandy Pond.

- 6.15 Please provide sufficient information and documentation to demonstrate that the proposed point of delivery into ISO-NE, along with their proposed interconnection and transmission upgrades including any transmission upgrades beyond the point of interconnection, is sufficient to ensure full dispatch of the proposal's Clean Energy Generation profile.

GridAmerica has conducted an *Overlapping Impact Assessment of Capacity Deliverability* study, which is provided in Attachment 6.7.2 (confidential). The study identifies the NEP and Eversource AC network upgrades necessary to ensure the full dispatch of the project's capacity in accordance with ISO-NE PP10. Please refer to Section 6.12 for corresponding AC network upgrades. The Quebec AC System Upgrades, the GSPL Project and the New England AC System Upgrades together will ensure full dispatch of the proposal's Clean Energy generation profile.

**SECTION 7 OF APPENDIX B TO THE RFP
ENVIRONMENTAL ASSESSMENT, PERMIT ACQUISITION PLAN AND NEW CLASS I
RPS CERTIFICATION**

This section addresses environmental and other regulatory issues associated with project siting, development and operations for both generation and transmission projects, as applicable.

- 7.1 Provide a list of all the permits, licenses, and environmental assessments and/or environmental impact statements required. If a bidder has secured any permit or has applied for a permit, please identify in the response.
- i. Provide a list of all Federal, state and local permits, licenses, and environmental assessments and/or environmental impact statements required to construct and operate the project.

GSPL Project

Table 7.1.1 below provides a list of federal and state permits, approvals and environmental reviews that will be required by the GSPL Project. A summary of the major Canadian permits that may be required is also provided. The Eversource and NEP-owned AC system upgrades are expected to require the same New Hampshire permits on the same schedule as the GSPL Project. At the time of this bid submittal, GridAmerica has not yet submitted any permit applications and has not yet received any of the permits identified in Table 7.1 below. However, early critical issues analyses and permit planning activities have been extensive in order to identify permit requirements, minimize potential for project impact and refine project planning based on public/stakeholder comments received. These early pre-permit planning activities serve to facilitate the overall permitting effort and are consistent with the goals and objectives of both the Vermont and New Hampshire regulatory processes for siting and licensing transmission projects as described below. As explained in Section 6.3, no local land use approvals will be necessary for the GSPL Project; however, Section 1111 permits will be needed from the municipality where the new line will cross town-owned roadways.

Mistissini Project

Table 7.1.2 below provides a list of federal, provincial and local government permits, approvals and environmental impact assessments that will be required for the Mistissini Project.

With the exception of the LOI, RES Canada has not yet submitted any permit applications and has not yet received any of the permits identified in Table 7.1.2 below. However, early critical issues analyses and permit planning activities were undertaken to identify potential issues, permit requirements, minimize potential for project impact and refine project planning. As such, the project as presented in the Site Layout Plan included in *Attachment 6.1.20 (confidential) – Mistissini Site Layout Plan* has already been designed to avoid sensitive site features such as wetlands, waterbodies, recreational areas, and any protected or conservation lands. As indicated in Section 6.3 above, the provincial government and the relevant Cree authorities consider the area to be compatible with large-scale wind energy, provided impact assessment and adapted

mitigation strategies are implement to minimize the overall impact of the project on local communities, First Nations and the environment.

Vauban Project

Table 7.1.3 below provides a list of federal, provincial and local government permits, approvals and environmental impact assessments that will be required for the Vauban Project.

With the exception of the LOI, RES Canada has not yet submitted any permit applications and has not yet received any of the permits identified in Table 7.1.3 below. However, early critical issues analyses and permit planning activities were undertaken to identify potential issues, permit requirements, minimize potential for project impact and refine project planning. As such the Project as presented in the Site Layout Plan included in *Attachment 6.1.21 (confidential) – Vauban Site Layout Plan* has already been designed to avoid sensitive site features such as wetlands, waterbodies, recreational areas, and any protected or conservation lands. As indicated in Section 6.3 above, the provincial government considers the area to be compatible with large-scale wind energy, provided impact assessment and adapted mitigation strategies are implemented to minimize the overall impact of the project on local communities, First Nations and the environment.

- ii. *Identify the governmental agencies that will issue or approve the required permits, licenses, and environmental assessments and/or environmental impact statements.*

GSPL Project

Table 7.1.1 below identifies the federal and state agencies that will issue or approve the required permits and/or conduct the required environmental assessments. As noted above, GridAmerica has undertaken extensive pre-permit analysis and consultation and continues to coordinate permit efforts with each of identified jurisdictional authorities.

Table 7.1.1 Federal, state, and local permits, licenses, and environmental requirements for constructing the HVDC Line.

Federal	
Permit / License / Environmental Requirement	Issuing Agency
Presidential Permit	U.S. Department of Energy
National Environmental Policy Act (NEPA) Review	U.S. Department of Energy (lead agency) U.S. Army Corps of Engineers U.S. Fish and Wildlife Service
Section 106 Consultation under National Historic Preservation Act	U.S. Department of Energy in consultation with State/Tribal Historic Preservation Offices
U.S. Department of Army/Corps of Engineers Permits Under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act	U.S. Army Corps of Engineers
Determination of No Hazard (Air Navigation)	Federal Aviation Administration
Endangered Species Act consultation	U.S. Fish and Wildlife Service
Authorization for construction and operation of Project in the Silvio O. Conte Nat'l Fish & Wildlife Refuge/Compatibility Review	US Fish and Wildlife Service
Special Use Authorization	U.S. Forest Service – Green Mountain National Forest
NPDES Construction General Permit (NH only)	U.S. Environmental Protection Agency
State – Vermont	
Permit / License / Environmental Requirement	Issuing Agency
Certificates of Public Good (Sections 231 & 248)	VT Public Utility Commission
Certificate of Public Good for authorization to operate as an electric transmission company	VT Public Utility Commission
Section 401 Water Quality Certificate	VT Department of Environmental Conservation
Wetland Permit	VT Department of Environmental Conservation
Construction Stormwater Permit	VT Department of Environmental Conservation
Stormwater Discharges from New Development	VT Department of Environmental Conservation
Flood Hazard Area and River Corridor Permit	VT Department of Environmental Conservation
Construction (Air) Permit (& compliance with EPA emission requirements)	VT Department of Environmental Conservation
Stream Alteration/Stream Crossings Permit	VT Department of Environmental Conservation
Protection of Endangered and Threatened Species	VT Department of Fish and Wildlife
Stream Obstruction Permit	VT Department of Fish and Wildlife
Herbicide Application Permit	VT Agency of Agriculture, Food & Markets
Section 106 consultation (cultural resources)	VT Division for Historic Preservation
State Highway Use, Access and Work Permit	VT Agency of Transportation
State – New Hampshire	
Permit / License / Environmental Requirement	Issuing Agency

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Certificate of Site and Facility (incorporates all state permits and regulatory authorities) ⁴	NH Site Evaluation Committee (SEC)
Section 401 Water Quality Certificate	NH Department of Environmental Services
Wetlands Permit	NH Department of Environmental Services
Alteration of Terrain Permit	NH Department of Environmental Services
Shoreland Permit	NH Department of Environmental Services
Project Review for state-listed rare, threatened and endangered wildlife species	NH Fish & Game Department
Project Review for state-listed endangered/rare plants and exemplary communities	NH Natural Heritage Bureau
Section 106 consultation (cultural resources)	NH Division of Historic Resources
Use and Occupancy Agreement/Driveway Access	NH Department of Transportation
License to cross public land and waters	NH Public Utilities Commission
Fire Safety Plan Review	NH Department of Safety
Petition to commence business as a public utility	NH Public Utilities Commission
Local	
Permit / License / Environmental Requirement	Issuing Agency
N/A - Local land use regulation is preempted by state statute in Vermont and New Hampshire.	N/A
Section 1111 Highway Use Permit	Town Selectboard
Canadian	
Permit / License / Environmental Requirement	Issuing Agency
Decree from the Government of Quebec	Quebec Executive Council
National Energy Board Permit to Construct an International Power Line	National Energy Board
Various Provincial and Federal Permits	Quebec Ministry of the Environment Quebec Agricultural Board Quebec Energy Board International Boundary Commission

Mistissini Project

Table 7.1.2 below identifies the federal and provincial departments, and local governments that will issue or approve the required permits and approvals.

⁴ GridAmerica has listed several other state agencies without permitting authority because they are involved in reviewing the New Hampshire SEC application and assist in determining application completeness.

Table 7.1.2 – List of Permits and Approvals for the Mistissini Project

Permit, Authorization, License or Approval	Authority
Certificate of Authorization for construction (art 154, LQE)	Quebec Ministry of Sustainable Development, the Environment and the Fight Against Climate Change (MDDELCC)
Certificate of Authorization for operation (art. 154, LQE)	MDDELCC
Certificate of Authorization for water crossing (art. 22, LQE)	MDDELCC
Certificate of Authorization for wetland encroachment (art. 22, LQE)	MDDELCC
Certificate of Authorization for Concrete batch plant (art. 22, LQE)	MDDELCC
Certificate of Authorization for borrow pit (chapter Q-2, r.7 LQE)	MDDELCC
Certificate of Authorization for taking water (RPEP) (chapter Q-2, r.35.2, LQE)	MDDELCC
Letter of intent to allocate public land rights	Quebec Ministry of Energy and Natural Resources (MENR)
Public land reserve area	MENR
Land rights	MENR
Permit to open a non-exclusive lease (BNE) for mineral materials (Borrow pit)	MENR
Permit for wood harvesting (art. 227, chapter A-18.1, LADTF)	Quebec Ministry of Forests, Wildlife and Parks (MFFP)
Authorization to build multifunction roads (art. 233, chapter A-18.1, LADTF)	MFFP
Approval of the Transportation plan	Quebec Ministry of Transportation, Sustainable Mobility and Transport Electrification (MTMDET)
Special Permit for Outsized load in terms of Width, height, length, or overhang	MTMDET

Permit, Authorization, License or Approval	Authority
Aeronautical Obstruction Clearance Authorization	Transport Canada
Land Use Approval	NavCanada
Land Use Proposal Approval (Radar and airport facilities)	Department of National Defence
Land Use Proposal Approval (Radiocommunication)	Department of National Defence
Land Use Proposal Approval (National Radio Services)	Royal Canadian Mounted Police (RCMP)
Land Use Proposal Approval (Meteorological Service of Canada)	Environment Canada
Land Use Proposal Approval (Infrastructure services radio communication)	Quebec shared services center
Approval of the Land Use Proposal (Canadian Hazards Information Service)	Natural Resources Canada
Certificate of compliance to TE Development and Land Use Plan	Eeyou Istchee James Bay territory authority

Vauban Project

Table 7.1.3 below identifies the federal and provincial departments, and local governments that will issue or approve the required permits and approvals.

Table 7.1.3 – List of Permits and Approvals for the Vauban Project

Agency	Permit/Approval	Requirement	Connected Actions or Studies
Federal			
Canadian Coast Guard (CCG)	Radiocommunication and radars interference clearance	Interference to protected undisclosed systems must be avoided or mitigated.	An evaluation request must be sent to the CCG as part of the electromagnetic interference assessment.
Department of Fisheries and Oceans (DFO)	Approval or Clearance under the <i>Fisheries Act</i> , Section 35(2)	No one may carry out any work or undertaking that results in the harmful alteration, disruption or destruction of fish habitat (HADD), unless authorized by the Minister of Fisheries and	Submit an application for a HADD or commit to prescribed mitigation measures to comply with clearance conditions.

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		Oceans Canada. The §35(2) Authorization authorizes the HADD and not the project resulting in the HADD. The project does not need a §35(2) Authorization to proceed. However, if a HADD results and an Authorization was not issued, the proponent may be guilty of an offence.	
Department of National Defence (DND)	Radiocommunication and radars interference clearance	Interference to protected undisclosed systems must be avoided or mitigated.	An evaluation request must be sent to two DND departments as part of the electromagnetic interference assessment.
Environment Canada (EC)	Radiocommunication and radars interference clearance	Interference to protected undisclosed systems must be avoided or mitigated.	An evaluation request must be sent to EC as part of the electromagnetic interference assessment.
NAV CANADA	Land Use Clearance, CANADIAN AVIATION REGULATIONS (CARS) 2012-1	Aviation safety may preclude certain land uses near airports or air navigation installations.	Application must be filed.
Transport Canada	Aviation Obstruction Clearance, CANADIAN AVIATION REGULATIONS (CARS) 2012-1	<i>Under § 601.22</i> , wind turbines may be considered an obstacle to air navigation. <i>Under § 601.24</i> wind turbines may need to be marked and/or lighted for Aviation Safety.	Application must be filed.
	Navigable Waters Approval or Clearance, NAVIGABLE WATERS PROTECTION ACT	No one may carry out any work or undertaking that restricts the public right of navigation without authorization. If the waters or the undertaking are classified as minor through a self-assessment, a clearance may be obtained instead of an authorization.	Evaluate the presence of navigable waters. File a notification for clearance or an application for authorization.
Provincial			
Commission de la protection du territoire agricole (CPTAQ)	Permis d'enlèvement de sol arable, <i>Loi sur la protection du territoire et des activités agricoles</i> (L.R.Q., c P-41.1), Section 5. <i>Règlement d'application de la Loi sur la protection du territoire et des activités</i>	No one may remove arable land in agricultural zoning or extend agricultural areas without a permit, unless otherwise allowed under the law.	Not applicable if the Project is located only on Public Land. The project is currently only on Public Land.

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	<i>agricoles</i> (P-41.1, r.0.1)		
Ministère du Développement durable, Environnement et de la lutte contre les changements climatiques (MDDELCC)	Decree, <i>Loi sur la qualité de l'environnement</i> (chapitre Q-2)	No one may carry out any work or undertaking without following the procedure for evaluating and examining environmental impacts and obtaining governmental authorization.	Submit a Project Notice and an Evaluation Impact Assessment.
	EIA Receivability, <i>Règlement sur l'évaluation et l'examen des impacts sur l'environnement</i> (R.R.Q., 1981, c. Q-2, r. 9)	All environmental evaluations must be prepared per the specified requirements of the regulation.	Consultation with various governmental agencies to identify appropriate assessment protocols and study requirements.
	Various Certificates of Authorization (CofA): deforestation, construction, sand or gravel removal, operations, etc.	No one may carry out any work or undertaking that may result in emissions or discharges of contaminants in the environment or a change in the quality of the environment without obtaining a Certificate of Authorization.	Application for: clearing, civil work, substation, electrical, turbine erection, and operation.
Ministère des Forêts, Faune et Parcs (MFFP)	Authorization for roadwork, other than for forestry roads, on domain of the state, <i>Loi sur les forêts</i> (L.R.Q., Section F-41)	No one may carry out any road work in public forests without an intervention permit.	Application must be filed.
	Authorization to cut timber on domain of the state, <i>Loi sur les forêts</i> (L.R.Q., Section F-41)	No one may carry out any forestry work or undertaking, other than road maintenance, without an intervention permit.	Application must be filed.
Sureté du Québec (SQ)	Radiocommunication and radars interference clearance	Interference to protected undisclosed systems must be avoided or mitigated.	An evaluation request must be sent to the SQ as part of the electromagnetic interference assessment.
Local			
Municipalities	<i>Lettre de conformité</i> (Letter of conformity)	Project must conform with the municipal by-laws of each municipality within the Project area.	A letter requesting evaluation of conformance must be sent to each municipality.

7.2 Provide the anticipated timeline for seeking and receiving the required permits, licenses, and environmental assessments and/or environmental impact statements. Include a

project approval assessment which describes, in narrative form, each segment of the process, the required permit or approval, the status of the request or application and the basis for projection of success by the milestone date. All requirements should be included on the project schedule in Section 10.

GSPL Project

The attached Figure 7.2.1 project schedule provided in Section 10 presents includes the anticipated timeline for the U.S. federal and state environmental permits required for the GSPL Project. GridAmerica anticipates obtaining all necessary permits for the GSPL Project by Q3 2019. It is likely that the GSPL Project will successfully achieve this permitting goal for a number of reasons, including: (a) the limited nature of the environmental impacts of the GSPL Project, as described in Section 7.3; (b) GridAmerica's commitment to early and frequent collaboration with all relevant permitting authorities, which is well underway; and (c) the support of environmental stakeholders with respect to GridAmerica's GSPL Project. Environmental stakeholder support is anticipated since a key purpose of the RFP and the GSPL Project is to help the Commonwealth of Massachusetts meet its Global Warming Solutions Act (GWSA) goals. The GSPL Project operations will improve air quality within the region while reducing the amount of greenhouse gases otherwise produced to satisfy the energy demands of the Commonwealth.

In addition to the GSPL Project permitting, this section includes a brief discussion of the Canadian permitting and approval process. That process is expected to run in parallel with the GSPL Project permitting. Similarly, the Eversource and NEP owned AC system upgrades are anticipated to require the same New Hampshire permits as the GSPL Project and those permits are expected to be received on the same timeline.

As discussed in Section 7.1, the GSPL Project permitting includes, among others, a Presidential Permit from the U.S. Department of Energy (DOE), a Certificate of Public Good issued pursuant to 30 V.S.A. § 248 (Section 248) from the Vermont Public Utility Commission (PUC), and a Certificate of Site and Facility from the New Hampshire Site Evaluation Committee (SEC). Various state environmental permits are also required and in the case of New Hampshire are incorporated into the SEC proceeding. The federal and the state permitting will proceed on parallel tracks. The following narrative provides an overview of the federal and state permitting proceedings and the basis for the anticipated permitting timeline.

7.2.1 U.S. Federal Permitting

The proposed interconnection with HQT at the U.S./Canada border in the town of Norton, Vermont will trigger the need for a Presidential Permit from DOE. The permitting timeline presented in the project schedule (see Section 10) shows an approximately 22-month process to obtain the Presidential Permit, starting with filing the Presidential Permit application during Q3 2017 and concluding with issuance of the Record of Decision (ROD) during Q3 2019. This timeline is consistent with DOE regulatory guidelines and with other DOE Presidential Permit proceedings, including another recent proceeding in Vermont.

As part of the Presidential Permit process, DOE will also conduct an environmental review under the National Environmental Policy Act (NEPA). DOE has indicated in preliminary discussions a commitment to coordinating its environmental review with other federal agencies and plans on serving as the lead federal agency for review of the GSPL Project under NEPA. This will help ensure

an efficient and coordinated review among the federal permitting agencies. To ensure that the anticipated permitting timetable is conservative and achievable, GridAmerica has assumed that DOE will conduct a full Environmental Impact Statement (EIS), which DOE regulations state is a 18-24 month process. However, it is possible that DOE might decide that an Environmental Assessment (EA) is sufficient given that much of the GSPL Project will occur within or adjacent to existing rights of way, including areas that were studied in prior NEPA documents. If DOE relies on an EA and Finding of No Significant Impact to satisfy NEPA instead of a full EIS, this would substantially reduce the anticipated federal permitting timeline.

The GSPL Project will also require wetlands and river crossing permits from the U.S. Army Corps of Engineers (USACE). Based on preliminary discussions with the USACE New England District, the Corps plans to coordinate its permit review with other federal agencies, including relying on the NEPA documents developed by DOE, and anticipates that it will be able to issue the necessary authorizations for the GSPL Project within the anticipated timeline for the Presidential Permit. GridAmerica anticipates filing complete USACE applications, including the results of extensive wetland field work, in Q3 2018. Based on preliminary discussions with USACE and extensive prior experience obtaining similar permits from USACE New England Division, GridAmerica reasonably anticipates receipt of the USACE permit during Q3 2019.

The federal permitting timeline also reflects the Endangered Species Act (ESA) Section 7 consultation with the U.S. Fish and Wildlife Service and consultation under Section 106 of the National Historic Preservation Act, both of which are anticipated to be completed by the time the DOE NEPA process is completed. GridAmerica anticipates initiating these formal consultations in Q3/Q4 2017. GridAmerica anticipates that these formal consultations will be completed well before Q3 2019. The GSPL Project also will need authorization from the U.S. Fish and Wildlife Service to construct and operate through the Silvio O. Conte National Fish and Wildlife Refuge – Nulhegan Basin in Northern Vermont (Conte NFWR). Preliminary conversations with USFWS representatives have begun in order to coordinate the anticipated NEPA analysis of the Refuge crossing and minimize potential impacts. As noted, the NEPA timing assumes a more conservative and time consuming process in order to accommodate the potential for EIS level scrutiny as well as to allow for potential coordination amongst federal agencies. However early interactions may facilitate a more streamlined approach.

Additionally, the GSPL Project may require a Special Use Authorization, likely in the form of a Special Use Permit, from the U.S. Forest Service for construction and operation of the GSPL Project in the Green Mountain National Forest in Vermont. A review of the Forest Plans has begun in order to coordinate the Forest crossings and minimize potential impacts. GridAmerica anticipates filing for Special Use Permits in Q2 2018 and completing the process approximately one year later so that they may be issued at the completion of the NEPA process. GridAmerica expects that the process for authorization from USFWS for the GSPL Project through the Conte NFWR will follow the same timeline. Again, the permit schedule assumes a more conservative and time consuming process in order to accommodate the potential for coordination amongst federal agencies. However, a more streamlined approach may be likely, particularly given the multiple use goals of the National Forests. Additionally, one of the published goals of the Green Mountain National Forest Management Plan is the protection/enhancement of air quality in the region – highly consistent with the GWSA goal that the GSPL Project seeks to help meet.

Finally, GridAmerica anticipates that the GSPL Project will require a Determination of No Hazard by the Federal Aviation Administration. This Determination would be required prior to construction and given the existing transmission lines along the proposed HVDC right of way, issues are not anticipated. However an early filing with later update would be made in order to solicit review of the area well in advance of the need so that potential concerns can be addressed as part of the overall NEPA review process, if any exist.

7.2.2 Vermont Permitting

The Project will require a Certificate of Public Good under Section 248 from the PUC before construction may begin in Vermont. Simultaneously with its Section 248 application, GridAmerica will petition the PUC for approval to operate as a transmission owner in Vermont under Section 231 of Title 30 of the Vermont Statutes. That petition will be consolidated into the Section 248 proceeding. The timeline presented shows the major components of the Section 248 process and anticipated timelines and durations based on the statute and extensive experience with previous PUC proceedings for large utility projects. The GSPL Project permitting timeline shows the required Pre-Application Notice occurring after the scheduled decision in the Massachusetts Clean Energy RFP process, and estimates that the PUC will issue its Final Order in September 2019, approximately eighteen months after the filing of the Section 248 Petition. This timeline is consistent with previous PUC practice.

The Vermont Agency of Natural Resources (VANR) will be a statutory party to the Section 248 proceeding and will be expected to make findings and provide recommendations regarding the Project and anticipated impacts to natural resources. VANR also serves in a regulatory capacity with regard to the issuance of state environmental permits. A number of those permits will be required from the VANR's Department of Environmental Conservation (DEC) including: Wetland Permit; Stream Alteration Permit; Flood Hazard Area and River Corridor Permit; Stormwater Discharge permits; and a Section 401 Water Quality Certificate. VANR's Department of Fish and Wildlife will likely need to issue permits regarding protection of endangered and threatened species and stream obstruction. The Vermont Agency of Agriculture, Food & Markets will likely require a permit for application of herbicides and any disturbance to certain agricultural lands in the transmission line right of way. The Vermont environmental permits are summarized below. Based on past projects, that application review will run concurrently with the Section 248 proceeding with issuance of the individual permits anticipated just before the PSB issues its Final Order. In sum, all the environmental permits discussed below will likely be issued before September 2019.

Vermont Department of Environmental Conservation (VDEC)

VT Section 401 Water Quality Certification

The USACE will need a Water Quality Certification from the VDEC before the USACE will issue a Section 404/Section 10 permit for the GSPL Project. In this Certification, VDEC determines that the activity will be carried out in a manner that will comply with the Vermont Water Quality Standards and any other applicable Vermont regulations.

VT Wetlands Permit

VDEC requires wetland permits for activities that are not specifically allowed within wetlands considered to be significant – Class I or Class II – and their buffer zones. All uses that are not allowed uses require either an Individual Wetland Permit or Vermont Wetland General Permit.

VT Construction Stormwater Permit

The US EPA has delegated to Vermont the authority to issue National Pollution Discharge Elimination System permits. Depending on the amount of earth disturbance, VDEC can authorize the applicant to proceed under Construction General Permit 3-9020 (Effective September 13, 2006) or may require the applicant to obtain an Individual Discharge Permit.

VT Stormwater Discharge Permit for New Development

Coverage is required under General Permit 3-9015 for new stormwater discharges to all Waters of the State from new development in which the area of all impervious surfaces generating regulated stormwater runoff is at least one acre. Projects that do not qualify for coverage under GP 3-9015 may be required to obtain an Individual Stormwater Discharge Permit.

VT Flood Hazard Area Permit

Any development within the FEMA designated 100-year floodplain (Special Flood Hazard Area) in a community participating in the National Flood Insurance Program requires a local development permit. VDEC reviews and comments upon these applications.

VT Stream Alterations/Stream Crossings Permit

This permit review seeks to protect against creation of flood hazards and damage to fish life; protects rights of neighboring landowners and, with respect to the stream alteration activity, ensures compliance with Vermont Water Quality Standards. Movement, excavation or fill of 10 or more cubic yards annually in any perennial stream or construction or maintenance of a berm in a flood hazard area or river corridor triggers the need for this permit.

VT Construction (Air) Permit

The installation of diesel back-up generation at the Norton converter station will require a construction air permit from VDEC. It anticipated based on preliminary engineering reviews that the project permitted as a “minor source” (<50 tons per year of any air pollutant).

Vermont Department of Fish and Wildlife (VDFW)

VT Taking of Endangered or Threatened Species Permit

A goal of the design and VANR consultation phases of this project is to identify any threatened or endangered plant or animal species and to avoid impacts to them. If that is not possible, this permit will be required.

VT Authorization for Permanent or Temporary Stream Obstructions

If a development will cause a permanent or temporary obstruction to the passage of fish through one or more streams, the Commission of VDFW must issue a letter authorizing the obstruction.

Vermont Agency of Agriculture, Food & Markets (Ag Agency)

Herbicide Right of Way Permit

Any use of herbicides to clear and maintain a right of way requires a permit from the Ag Agency. The Ag Agency would also review any impacts to prime agricultural land.

State and Local Highway Use, Access and Work Permit (19 V.S.A § 1111)

In order to install the new line, GridAmerica will obtain a Section 1111 permit from the Vermont Agency of Transportation (VTrans) to use, access or disturb any part of state-owned highway and, similarly, from the town Selectboards for use of municipal-owned roadways. Typically, these applications are submitted within a few months of the construction start date.

7.2.3 New Hampshire Permitting

The Site Evaluation Committee (SEC) in New Hampshire must issue a Certificate of Site and Facility (Certificate) for the GSPL Project before construction can start. By statute, the SEC must issue its final decision within one year from its acceptance of the application, and the timeline presented shows the major steps and statutory timeframes for the SEC process. The process begins with public notice and conduct of Pre-Application Public Information Sessions in each affected county at least 30 days prior to filing the SEC application followed by the filing of the application near the end of Q1 2018 after the scheduled decision in the Massachusetts Clean Energy RFP process. The SEC process continues with acceptance of the application within 60 days of filing, and additional public information sessions, adjudicatory hearings and final issuance of its Decision and Order and Certificate within one year of application acceptance, which is estimated to occur at the very latest during Q3 2019. This anticipated timeline is consistent with the statutory requirements for the SEC process. Extensions to the one-year timeframe for a final decision can be made by the SEC when necessary, but GridAmerica does not anticipate that the SEC will need more than one year from application acceptance for the GSPL Project for a number of reasons, including the limited length of the HVDC line in New Hampshire.

In New Hampshire, the Certificate encompasses all permits required to construct the project. Accordingly, the application to the SEC must include completed applications forms for each state permitting agency. The SEC distributes these applications to each agency, which reviews them and provides draft and final permits to the SEC on or before the dates established in the SEC's procedural schedule for the siting proceeding. These final agency permits are incorporated into the SEC's final siting Certificate. The completed New Hampshire Department of Environmental Service (NHDES) permit applications expected to be filed with the SEC application would include: Wetlands Permit; Alteration of Terrain Permit; Shoreland Permit and a Section 401 Water Quality Certificate. Each of these permits is discussed further, below. Other regulatory agencies that conduct project reviews through the SEC process include: New Hampshire Natural Heritage Bureau; New Hampshire Fish & Game Department; Department of Cultural Resources Division of Historical Resources; New Hampshire Department of Transportation; New Hampshire Public Utilities Commission; and State Fire Marshall. Additional permits and approvals that might be required from NHDES during the construction phase of the GSPL Project, such as state groundwater discharge permits or laydown area approvals, are listed in but not necessarily submitted with the SEC application, so that the Certificate can simply be conditioned upon receipt of the permits and approvals before construction begins.

NH Wetlands Permit

New Hampshire laws and rules require issuance of a Wetlands Permit by the NHDES for unavoidable impacts to wetlands or other waters of the state from dredging, filling and construction activities. Review varies depending upon the extent of permanent impacts. The permitting process involves multi-agency review and development of conditions to govern permitted activities. Compensatory mitigation for permanent wetlands impacts may be required if certain regulatory thresholds are exceeded. By statute, if a designated river is within ¼ mile of the project, the wetlands application must be reviewed by the Local River Management Advisory Committee and applicants must also ensure a Project Review by the SHPO for assessment of potentially impacted historic/archeological resources. The NHDES wetlands permit process requires submission of a report from the Natural Heritage Bureau database check for potential impact to endangered and other species, in consultation with the NH Fish & Game Department.

NH Section 401 Water Quality Certification

Project applicants seeking to conduct federally regulated activities involving wetlands dredge and fill or discharge to navigable waters must provide a Section 401 Certificate from the NHDES verifying that discharges from construction and operation of the permitted activity will meet the New Hampshire Surface Water Quality rules, taking into account potential impacts to designated uses of the surface water. Projects eligible for coverage under the USACE Programmatic General Permit (PGP) for New Hampshire can be covered by the 401 Water Quality Certificate issued for the PGP; however, the PGP 401 WQC may be modified by NHDES to include more specific conditions to ensure compliance with water quality standards. Individually permitted projects require individual water quality certificates issued by the NHDES. The water quality certification process includes consultation with other state programs, including the Rivers Management and Protection Program and the NH Fish & Game Department.

NH Alteration of Terrain Permit

Alteration of Terrain (AoT) permits are issued by NHDES to control soil erosion and manage stormwater runoff for projects proposing to dredge, excavate, place fill, mine, transport forest products, or undertake construction in or on state waters, or that would significantly alter the characteristics of the terrain. Project proponents require either an individual AoT permit, a general permit by rule and/or a timber harvesting permit, depending upon the project activities. In general, projects proposing to disturb more than 100,000 square feet (2.3 acres) of contiguous terrain (50,000 square feet, 1.1 acres, if any portion of the project is within the protected shoreland) or proposing to disturb an area having a grade of 25 percent or more within 50 feet of any surface water, would require a permit, although a general permit by rule is available for certain utility projects.

NH Shoreland Permit

New Hampshire's Shoreland Water Quality Protection Act requires NHDES to issue a permit for construction, excavation or filling activities conducted within 250 feet from the reference line of protected water bodies, including designated rivers and river segments under RSA 483, as well as 4th order and greater streams and rivers. A shoreland permit is not required for impacts within the protected shoreland if they are covered by a wetlands permit and an alteration of terrain permit received from NHDES.

NH DOT (Driveway/Use Occupancy) Permit

NH DOT regulates driveways and other accesses to public ways under §236:13. A written construction permit application is required prior to construction describing design and providing sketch details/plan drawings depicting location.

7.2.4 Canadian Environmental / Regulatory Matters

The following is an overview of the primary permits that are potentially required for the construction and operation by HQT of a new transmission line between the Des Cantons Substation and the Quebec/Vermont border.

Decree from the Government of Quebec and Certificate of Authorization from the Ministry of the Environment

A Certificate of Authorization (governmental decree) from the Government of Quebec is likely required in order to construct a power transmission line of more than 2 km in Quebec, pursuant to section 2(k) of the Regulation respecting environmental impact assessment and review) and section 31.5 of Quebec's Environment Quality Act, RSQ, c Q-2. This governmental decree can only be issued once the provincial Environmental Impact Assessment and Review Procedure has been completed in connection with the GSPL Project. This procedure involves the preparation of a detailed Environmental Impact Assessment statement, public consultation and, if requested, public hearings. Once this process has been completed, the application is submitted to the Quebec Executive Council, and the Government must then decide whether to authorize the GSPL Project, and if so under which conditions. A Certificate of Authorization must also be obtained from the Ministry of the Environment pursuant to section 22 of the EQA to authorize the construction and operation of the proposed power line. This authorization follows the issuance of the governmental decree and is more technical in nature. The timing of these permitting processes can 12 to 30 months. The processing time for the GSPL Project is anticipated to fall on the shorter side of that range since much of the route that GridAmerica believes will be selected by HQT, which is adjacent to an existing transmission line, has recently been analyzed for other projects and should have relatively fewer impacts. For these reasons, public support for the line in Canada is expected to be strong, which will further enhance permitting. Based on this, GridAmerica anticipates filing for these permits in Q2 2018 and receiving them by the end of 2019.

National Energy Board Permit to Construct an International Power Line

A Permit or Certificate issued by the National Energy Board (NEB) is required under section 58.1 of the National Energy Board Act in order to construct or operate an international power line. If the proposed power transmission line has a voltage of 345kV or more and requires 75 km or more of new right of way, the GSPL Project is also be subject to a federal environmental assessment under the *Canadian Environmental Assessment Act, 2012*. The permit is an expedited process that takes approximately 6-18 months, while the certificate process is approximately 12-24 months. Due to the overlapping issues between the governmental decree and the NEB authorization, it is likely that HQT will seek a permit. In either case, GridAmerica anticipates that the process will fall on the shorter side of the processing time range for the same reasons stated above for the Government Decree. The NEB process can proceed in parallel with the governmental decree and GridAmerica anticipates filing for and receiving either a permit or certificate within the timeframe for the Government Decree (before the end of 2019).

Other Canadian Permits

Other Canadian permits that may be required for the transmission line in Canada include authorization from the Quebec Agricultural Board for structures on protected agricultural land, Authorization from the Quebec Energy Board is required to construct an energy transmission line worth \$25 million or more, a notice of conformity from the applicable municipal and regional authorities, a permit or licence from the NEB to export electricity, permission from the International Boundary Commission to construct any work within ten feet of the Canada-USA boundary, authorization from Fisheries and Oceans Canada if the GSPL Project involves work that could result in serious harm to fish that are part of a commercial, recreational or Aboriginal fishery or to fish that support such a fishery, and confirmation letters from Transport Canada and NavCanada in connection with aeronautical safety. All of these permits may be processed in parallel with Government Decree and are expected to be obtained before the end of the 2019.

Mistissini Project

This section describes each segment of the permitting process, the required permit or approval, the status of the request or application and the basis for projection of success by the milestone date mentioned in the previous timeline table (Section 7.2.1). The different permits, authorization and approvals are gathered in function of the specific process to which they belong: 1) Certificates of Authorization requested by the Quebec's Environment Quality Act; 2) Public land rights process with MENR; 3) Sectorial permits requested for construction purposes; 4) Third party land use approvals pertaining to radiocommunication systems.

Certificates of Authorization under EQA/JBNQA

Quebec's Environment Quality Act (EQA) contains specific provisions in accordance with the James Bay and Northern Quebec Act (JBNQA), which was signed by the Cree and Inuit. In particular, the Environmental and Social Impact Assessment (ESIA) procedure differs from that of other regions of Quebec due to the active participation of the Cree and Inuit communities, among other aspects.

Three committees have been created to evaluate and review development projects located in Cree Territory (north of the 49th and south of the 55th parallels - Section 22 of the JBNQA):

- the Evaluating Committee (COMEV) is a tripartite Quebec/Canada/Cree agency responsible for assessing and drawing up guidelines for the impact study;
- for the review of these projects,
 - the Review Committee (COMEX) is a bipartite Quebec/Cree agency responsible for reviewing projects within the jurisdiction of Quebec;
 - the Federal Review Panel (COFEX) is a bipartite Canada/Cree agency responsible for reviewing projects within the jurisdiction of Canada.

It is not likely that the federal impact assessment process will be triggered under the Canadian Environmental Assessment Act (CEAA), but RES Canada can expect the federal departments will eventually issue a specific guideline under the CEAA with the support of the Federal Coordinator, the Canadian Environmental Assessment Agency. An agreement between CEAA and the Crees has been established to review projects of a federal nature under the JBNQA, and those triggered by the CEAA, in order to avoid unnecessary duplication. Based on past experience, a wind farm project is

solely of provincial nature, as it is clearly a natural resource development project. This is the reason why the federal impact assessment process should not be triggered.

Finally, Certificates of Authorization issued under the EQA will be required upon approval of the ESIA under procedures established in Section 22 of the JBNQA. All the other Certificates of Authorization, issued for specific issues (wetlands infringement, water crossing, concrete batch plant, borrow pit, water pumping), will be requested prior to the beginning of the construction. All these Certificates of Authorization benefit from standardized treatments by the MDDELCC. The Certificates of Authorization are issued within 60 days of a request.

Commencing in November 2017, RES Canada will initiate the ESIA by filing the Project Notice and plans to commence environmental survey work (wildlife, geotechnical, socioeconomic, cultural, archeological, noise) in March 2018 and host two public events in order to share information on the projects with the communities and gather comments. The ESIA is expected to be completed and submitted to COMEX in January 2019 for their review and approval. COMEX is expected to issue a decision in April 2019. The requests for Certificates of Authorizations are planned to be filed in September 2020, in time to obtain them in January 2021 prior to the start of construction. It should be noted that the environmental process as depicted herein is relatively quick and straightforward namely because of the absence of a public hearing process or the need for a governmental decree.

Sectorial permits requested for construction purposes

The sectorial permits requested concerns the wood harvesting, the construction of multi-purpose road on public land, the exploitation of borrow pits on public lands, the transportation plan and the oversize loads on the public roads. All these permits and approvals benefit from standardized treatments by the agencies. The permits and approvals are issued within 60 days of their request.

Third party land use approvals pertaining to aviation safety and radiocommunication systems

In order to ensure aviation safety, approvals and clearances from Transport Canada and Nav Canada must be obtained prior to construction.

Additionally, as an industry best practice notification to the Department of National Defence, Royal Canadian Mounted Police, Quebec's Shared Services Centre and Environment Canada (weather radars) is strongly suggested, in order to identify any potential interference with their systems. In rare cases, mitigation measures may be needed (relocation of turbines, system reconfiguration) to reduce impact and avoid permitting delay from the key permitting agencies.

Approvals and responses benefit from standardized treatments by the agencies. The approvals are typically issued within 60 days of a request.

Vauban Project

The following narrative provides an overview of the environmental assessment (EA) and permitting process applicable to the Vauban Project, together with details regarding pertinent milestones in the permitting process.

Preparation of Environmental Impact Study (EIS)

In February 2018, following the announcement of selected projects by the Massachusetts Department of Energy, RES Canada will commence environmental permitting for the project

pursuant to the EA process administered by the Quebec Ministry of Environment (MDDELCC). This process is initiated by filing a project notice with the MDDELCC.

Commencing in March 2018, RES Canada will initiate environmental survey work (wildlife, geotechnical, socioeconomic, cultural, archeological, noise) and host two public events in order to share information on the projects with the communities and gather comments. An Environmental Impact Study for the project is expected to be completed by the end of 2018 and submitted to the MDDELCC in January 2019 for review and approval.

MDDELCC Approval Process

When the EIS has been received by the MDDELCC, the ministry releases a demand for a public information process called the *Bureau d'audiences publiques sur l'environnement* (BAPE). Once the BAPE has made its recommendations to the ministry – after having held public information sessions – a notice of acceptability is released and the project is recommended to the minister for approval. This approval process can take 12 to 18 months and is planned to be completed by May 2020.

Governmental Decree

On the recommendation of the Environment Minister, a governmental decree authorizing the project is issued by the Cabinet of Ministers. This decree is the main permitting milestone for the project. The government decree is planned to be issued in September 2020, thus giving considerable time to obtain all other required permits and construct the projects in 2021-2022.

Certificates of Authorization and Other Permits

The government decree will prescribe conditions applicable to the project, which are detailed in one or more Certificates of Authorization issued by the MDDELCC. These certificates generally authorize the various phases of the construction of the project, including tree clearing, civil and electrical works, construction of the substation and the operations and maintenance building, erection of wind turbines and the operation of the projects. The demands for Certificates of Authorizations are planned to be filed in September 2020, in time to obtain them in January 2021 prior to the start of construction.

Following the Quebec government decree, construction of the project will be performed in accordance with a construction permit to be issued by the municipal government.

7.3 Provide a preliminary environmental assessment of the site and project, including both construction and operation, as applicable. In addition, the bidder should identify environmental impacts associated with the proposed project, any potential impediments to development, and its plan to mitigate such impacts or impediments. The analysis should address each of the major environmental areas presented below, as applicable to the proposed project:

- i. Impacts during site development
- ii. Transportation infrastructure

- iii. Air quality impacts
- iv. Access to water resources/water quality impacts
- v. Ecological and natural resources impacts
- vi. Land use impacts
- vii. Cultural resources
- viii. Previous site use (e.g., greenfield, brownfield, industrial, etc.)
- ix. Noise level impacts
- x. Aesthetic/visual impacts
- xi. Transmission infrastructure impacts
- xii. Fuel supply access, where applicable

GSPL Project

This section summarizes the environmental conditions in the area crossed by the existing Phase I HVDC line right-of-way in Vermont and New Hampshire, and provides a preliminary environmental assessment of construction and operation of the GSPL Project. Information presented describes anticipated impacts during site development and operation of the GSPL Project, including: potential impact to transportation infrastructure, air quality, water resources and water quality, habitats (i.e., wetlands, significant wildlife habitat, natural communities), as well as wildlife and plant species (including potentially occurring federally listed threatened, endangered, and rare species), land use, cultural resources, previous site use, noise, aesthetic/visual and transmission infrastructure. For each resource, potential implications for Project development are described and those resources that may require additional attention, such as field surveys or mitigation are identified.

Attachment 6.3 provides a preliminary environmental assessment of the Eversource and NEP-controlled AC system upgrades with a focus on the upgrades to the A-201 and B-202 AC transmission lines. GridAmerica anticipates that both Eversource and NEP will implement similar types of avoidance and minimization in accordance with their own environmental goals and policies. Notably, since the upgrades are largely expected to occur on existing lines, GridAmerica anticipates that environmental impacts will be substantially fewer and easier to avoid or minimize.

7.3.i. Site development impacts

The GSPL Project will be designed, constructed and operated in a manner that avoids or minimizes impacts to environmental resources within the GSPL Project area. Site development will involve several distinct activities, including the following:

Advance Planning Before construction begins, the Project team will undertake important coordination and field activities aimed at avoiding, minimizing and mitigating impacts. For instance, the team will designate natural vegetation buffer zones and the locations of access roads,

construction roads, structure foundations, structure assembly sites, conductor pulling sites, and grounding systems. Such advance planning will assure that tree cutting and brush disposal are properly conducted; equipment operation and construction activities are limited to designated areas; appropriate erosion control measures are applied; and tree marking and selective cutting precedes structure placement.

The GSPL Project team also will coordinate with Eversource and NEP to ensure that system upgrades under their control are completed prior to the completion of construction of the GSPL Project.

Clearing The existing 200-foot-wide HVDC right-of-way in Vermont and New Hampshire will be expanded by an additional 150 feet to the east, resulting in the clearing of approximately 930 acres of forest land. General vegetation clearing practices will likely be employed along most of the new right-of-way, but at ecologically sensitive locations, such as stream and wetland crossings, vegetation will be maintained to the extent practical using selective tree cutting and trimming techniques. Following construction, the right-of-way will be maintained in accordance with a transmission right-of-way management program similar to the vegetation maintenance on the existing right-of-way.

Access Roads New access roads will be predominantly located within the cleared portion of the right-of-way and will lead to transmission structure locations. However, existing and very well maintained access roads are present along the HVDC line in Vermont and New Hampshire. The existing access roads along the HVDC line will be utilized wherever possible and will be improved if required to provide safe and effective equipment access to each structure. During operation of the GSPL Project, the access roads will serve to facilitate maintenance activities.

Environmental impacts to existing vegetation, water and soil resources will be avoided or minimized by utilizing the existing access road infrastructure, by properly locating new roadways or upgrading existing roads as needed. Where site conditions such as steep slopes, sensitive streams and wetlands, or agricultural operations are a concern, off right-of-way access will be considered to avoid such sensitive sites. Where sensitive areas cannot be avoided, temporary access protection procedures will be utilized (e.g., crushed stone over geo-textile fabric or temporary swamp mats) prior to construction activities, which will be removed following completion of the construction.

Construction Construction activities of all consultants and contractors working on the GSPL Project will be coordinated to expedite the work function and assure that appropriate environmental standards are met. Where possible, transmission line structures will be located at least 100 feet from highway crossings, as well as streams, rivers and other major bodies of water to facilitate the establishment of vegetative buffer strips at these locations. To the extent feasible, transmission line structures will not be located within identified archaeological sites or other sites sensitive to disturbance, such as locations supporting rare plants. During construction and operation, all applicable water quality standards for rivers, streams and lakes will be met. The placement of structures in wetland areas and on steep slopes will be avoided where possible. However, when it is necessary to place structures within the limits of a wetland, care will be taken to protect the individual wetland during site preparation and the wetland resource as a whole. Each wetland will be reviewed to determine the best method of access to the structure site. Once access has been provided, the structure site will be prepared. Wood matting will typically be utilized to access structure sites and create working areas around structure sites. The wood matting will be removed after construction is complete, minimizing impact to the wetlands.

After structures are framed and erected, aerial ground wires and conductors will be strung using a lead line that can be walked through wetlands and vegetative buffer zones with minimum disruption. Conductors will be pulled through stringing blocks using pulling and tensioning equipment. During installation the tensions will be high enough to insure conductors do not touch the ground or interfere with other obstacles underneath. During the stringing operation, temporary guard structures will be placed at all crossings of highways, railroads, hiking trails and existing utility lines to ensure public safety and the continued operation of other utility equipment.

Conductor stringing sites will be designated at selected structure sites on the GSPL Project right-of-way. Such sites will involve set-up and operation of mechanized pulling equipment and conductor reels. Wetlands and other sensitive environmental sites will be avoided to the extent feasible, in locating such sites.

Material Storage Yards and Staging Areas During construction, it may be necessary to establish and utilize off-site areas that will serve as locations for construction-related facilities such as: office trailers; personnel parking, portable sanitary facilities, and telephones; material, equipment and vehicle storage; and minor equipment and vehicle maintenance.

The construction contractor will be responsible for securing property rights and constructing any facilities required for material storage yards and staging areas. Material storage yards will typically be located adjacent to major roads and/or railroads to allow efficient delivery of materials. Staging areas may be located on or off the right-of-way. Considering the length of this Project, several material storage yards and staging areas will likely be required. Material storage yards and staging areas will not be located in or within 100 feet of regulated wetland areas.

Establishment of these areas could require the following: vegetation clearing, removal and stockpiling of topsoil, site grading, spreading of gravel cover, and fencing. Additional vegetation clearing and grading for site access could also be required in some instances. These areas will be utilized at various times as construction proceeds along the route. Upon completion of the line, these areas will be restored to conditions comparable to those that existed before construction or otherwise managed in accordance with regulatory approvals.

Clean-up and Restoration Clean-up and restoration activities will be conducted as required at structure work sites and access roads. Sites requiring restoration as a result of the construction work will be identified and the appropriate restoration measures applied. This work may include: re-grading; repair of stream banks; temporary and permanent seeding and mulching for erosion control; reseeding of agricultural fields; and tree and shrub plantings in the vegetative buffer strips. All permanent seeding and tree and shrub planting work will be conducted during the growing season.

GridAmerica will perform all construction activities in accordance with all state and federal regulations. Additionally, GridAmerica will adhere to best management practices (BMPs) to minimize impacts to the environment and the surrounding community.

7.3.ii. Transportation infrastructure impacts

GridAmerica will obtain required permits from the Vermont Department of Transportation (VTrans) and the New Hampshire Department of Transportation (NHDOT) and will develop traffic control plans and construction access plans where required. GridAmerica would adhere to all load

limitations on roadways.

GridAmerica has identified airports and heliports within five miles of the GSPL Project rights-of-way and will conduct an obstruction evaluation pursuant to the Federal Aviation Administration (FAA) criteria in the Code of Federal Regulations (CFR) Title 14 Part 77.13 to verify that the final project design will not have any impact on air navigation. Since the proposed GSPL Project facilities will be located adjacent to similar, existing transmission line structures, adverse impacts to air navigation are not expected.

Between the U.S./Canada border and the Connecticut River crossing, the proposed HVDC route crosses only three major roadways: State Route 114, State Route 105, and U.S. Route 2. State Route 114 is crossed by the proposed HVDC route about 1 mile south of the U.S./Canada border. From that point the Phase I HVDC right-of-way continues through undeveloped forest lands for approximately 16.5 miles before crossing State Route 105. The next major road crossing at U.S. Route 2 is approximately 24.5 right-of-way miles south of the State Route 105 crossing. There are no other major road crossings for the last 10.4 miles in Vermont between the U.S. Route 2 crossing and the Connecticut River. South of the Connecticut River crossing the HVDC right-of-way crosses State Route 18/135 and then Interstate-93, crossing State Route 135 again before reaching the proposed converter station site.

Table 7.3.1: Airports and Heliports within 5 Miles of the GSPL Project HVDC Right-of-way

Facility Name	Facility Type	Town/County	Distance from HVDC Line	Direction from HVDC Line
Wenlock Crossing	Heliport	Ferdinand/Essex	3.0 miles	Southwest
Littleton Hospital	Heliport	Littleton/Grafton	2.7 miles	Southeast

Source: BTS, 2015

7.3.iii. Air quality impacts

GSPL Project operations will improve air quality within the region while reducing the amount of greenhouse gases and other air pollutants produced to satisfy the energy demands of Massachusetts consumers. A key purpose of the current bid is to help the Commonwealth of Massachusetts meet its Global Warming Solutions Act (GWSA) goals, and the GSPL Project offers a means to deliver up to 1200 MW of clean energy to the region.

Air quality impacts associated with the construction of the transmission line are expected to be minimal, and limited to fugitive dust, vehicle exhaust, and possible use of temporary portable concrete batch plants during the construction period. Emissions during the operational phase would be limited to vehicle exhaust and dust during infrequent maintenance activities, such as inspections and vegetation management and the short-term use of back-up emergency generators that might be operated at the converter stations during emergencies. These emissions will be temporary in nature, and impacts will be minimal because of the rural nature of the GSPL Project area and temporary timeframe associated with construction or emergency activities. A fugitive dust control plan for construction will be developed if treatment is required with chemical or dust control agents for safety or visibility purposes. Temporary concrete batch plants and emergency back-up generators would be properly permitted as specified by state or local regulations.

7.3.iv. Access to water resources/water quality impacts

Impacts to water quality and water resources are not anticipated to be significant. GridAmerica will prepare a Stormwater Pollution Prevention Plan (SWPPP) intended to prevent pollution of surface and groundwater through implementation of best management practices (BMPs). These BMPs are designed to prevent soil erosion from stormwater runoff and manage releases of hazardous materials during construction. For the proposed Project, hazardous materials would be primarily limited to fuels and small amounts of lubricants in construction and maintenance vehicles.

The majority of the GSPL Project HVDC route in Vermont is located in the Upper Connecticut River Watershed and falls under the Passumpsic and upper Connecticut River Tactical Basin Plan prepared by the Vermont Agency of Natural Resources (VNR). The Passumpsic River watershed drains 507 square miles, a major portion of Caledonia County and minor portions of Essex, Orleans and Washington counties. The upper Connecticut River basin includes all the drainages north of the Passumpsic River watershed. The largest watershed in this basin is the Nulhegan at 151 square miles, followed by Paul Stream with a watershed of 44 square miles. In the past, the biggest influence on water quality in the GSPL Project area was runoff from logging operations.

The Vermont Water Resources Board (VWRB) classifies all surface waters in Vermont as either Class A or Class B. The October 30, 2014 Water Quality Standards recognize two categories of Class A waters. Class A (1) waters are ecological waters, which are managed to maintain waters in a natural condition. Class A (2) waters are managed as public water supplies and therefore allow moderate water level fluctuation. Class B waters are designated as being either Water Management Type 1, 2, or 3 depending upon their protection and management. An overlay of both Class A and Class B waters is an Outstanding Resource Water (ORW). These waters are designated by the VWRB as having exceptional natural, recreational, cultural, or scenic value. Most waters in the Northeast Kingdom, like in the rest of Vermont, are Class B, which is consistent with State policy to achieve and maintain Class B waters with suitability for swimming, boating, and drinking with treatment as well as for irrigation and livestock watering.

The proposed HVDC route in Vermont crosses 61 streams included in the National Hydrography Dataset (NHD), including the following named streams:

- Averill Creek
- Carr Brook
- Connecticut River
- Fitch Brook
- Halls Brook
- Madison Brook
- Miles Stream
- Notch Pond Brook
- Nulhegan River
- Number Six Brook
- Paul Stream
- Pond Brook
- Roaring Brook
- Stony Brook
- Suitor Brook
- Tolman Brook
- Wilke Brook

The proposed HVDC route crosses the Riverbend segment of the Connecticut River just below the Moore Dam. The portion of the HVDC right-of-way in New Hampshire is generally located parallel to the irregular shoreline of the Comerford Reservoir, which was created with the impoundment of the Connecticut River by the Comerford Dam, currently owned and operated as a hydroelectric facility by TransCanada. In addition to the Connecticut River (i.e. Comerford Reservoir), the existing right-of-way in New Hampshire crosses 8 streams included in the NHD, including the following named streams:

- Bill Little Brook
- Carter Brook
- Scarritt Brook

The proposed HVDC line will be an overhead configuration, and impact on streams will be minimized because transmission line structures can be located to maintain a vegetative buffer along stream banks. Use of existing access roads and existing stream crossings for construction and maintenance will also minimize impacts to water resources. The proposed converter stations at both ends of the new HVDC line will result in impervious areas; permanent stormwater management measures will be designed and implemented to manage stormwater runoff and meet local water quality standards.

7.3.v. Ecological and natural resources impacts

Wetlands The State of Vermont protects wetlands, which provide significant functions and values and also protects a buffer zone directly adjacent to significant wetlands. Wetlands in Vermont are classified as Class I, II, or III based on the significance of the functions and values they provide and are mapped on the Vermont Significant Wetland Inventory (VSWI) maps. Class I and Class II wetlands provide significant functions and values and are protected by the Vermont Wetland Rules. Any activity within a Class I or II wetland or buffer zone that is not exempt or considered an "allowed use" under the Vermont Wetland Rules requires a permit. The Vermont Wetland Rules do not protect Class III wetlands, although they are subject to jurisdiction under the federal Clean Water Act administered by the U.S. Army Corps of Engineers (USACE). All wetlands contiguous to wetlands shown on the VSWI maps are presumed to be Class II wetlands, unless identified as Class I or III wetlands, or unless determined otherwise pursuant to Section 8 of the Vermont Wetland Rules. A 50-foot buffer zone is designated adjacent to all Class II wetlands.

Based on a review of the VSWI, 15 wetlands are crossed by the existing HVDC line in Vermont for a total distance of approximately 1.14 miles; the longest individual crossing is approximately 1,397 feet. A total of 22 wetlands are located within the existing right-of-way, and the total area of wetlands within the existing right-of-way is approximately 28.4 acres. All of these wetlands are designated Class II. The proposed right-of-way expansion in Vermont may affect 22 individual wetlands with a total area of 20.5 acres within the proposed right-of-way expansion. All of these wetlands are designated Class II.

Based on a review of the National Wetlands Inventory (NWI), 14 wetlands are crossed by the existing HVDC line in Vermont for a total distance of approximately 1.32 miles; the longest individual crossing is approximately 2,116 feet. A total of 18 wetlands are located within the existing right-of-way, and the total area of wetlands within the existing right-of-way is approximately 33.7 acres. The proposed right-of-way expansion may affect 16 individual wetlands with a total area of 24 acres within the proposed right-of-way expansion in Vermont.

Based on a review of the NWI, three wetlands are crossed by the existing HVDC line in New Hampshire for a total distance of approximately 0.2 miles; the longest individual crossing is approximately 1,170 feet. A total of three wetlands are located within the existing right-of-way, and the total area of wetlands within the existing right-of-way is approximately 7.7 acres.

Table 7.3.2 presents the various wetland types that are located within the existing HVDC right-of-way in Vermont and New Hampshire based on NWI data. Table 7.3.3 presents the various wetland

types that are located within the proposed right-of-way expansion for the HVDC line in Vermont and New Hampshire based on NWI data.

Table 7.3.2: Wetland Types and Acreage within the Existing Phase I HVDC Right-of-Way in Vermont and New Hampshire

Wetland Type	Acreage within Existing HVDC Right-of-Way
Vermont	
Freshwater emergent	3.9
Freshwater forested/shrub	19.5
Riverine	8.9
Freshwater pond	> 0.1
Freshwater lake	1.4
Total	33.7
New Hampshire	
Riverine	1.0
Freshwater lake	6.7
Total	7.7
Grand Total	41.4

Table 7.3.3: Wetland Types and Acreage within the Proposed Right-of-Way Expansion in Vermont and New Hampshire

Wetland Type	Acreage within Proposed Right-of-Way Expansion
Vermont	
Freshwater emergent	4.0
Freshwater forested/shrub	11.6
Riverine	7.5
Freshwater lake	0.9
Total	24.0
New Hampshire	
Freshwater forested/shrub	>0.1
Riverine	0.4
Freshwater lake	1.9
Total	2.3
Grand Total	26.3

Construction activity within the limits of a wetland area can have lasting effects and is strongly discouraged by regulators. As the proposed HVDC line will be an overhead configuration, there will be less impact on wetlands because transmission line structures and conductor pulling sites can generally be located outside of wetland areas.

Wetland field delineations will be required along the route and the area planned for right-of-way expansion to accommodate the proposed HVDC line prior to filing permit applications. To the extent the right-of-way expansion impacts forested wetlands, the conversion of forested wetland habitat to a scrub-shrub or emergent wetland would constitute a permanent wetland impact that would require compensatory mitigation.

Vernal Pools A vernal pool, also referred to as a seasonal forest pool, is a natural, temporary to semi-permanent body of water occurring in a shallow depression that typically fills during the spring or fall and may dry during the summer. Vernal pools have no permanent inlet or outlet and no viable populations of predatory fish. A vernal pool may provide the primary breeding habitat for wood frogs (*Lithobates sylvaticus*), spotted salamanders (*Ambystoma maculatum*), blue-spotted salamanders (*Ambystoma laterale*), Jefferson salamanders (*Ambystoma jeffersonianum*), marbled salamanders (*Ambystoma opacum*), and fairy shrimp (*Eubrachipus* sp.), as well as valuable habitat for other plants and wildlife, including several rare, threatened, and endangered species.

Vermont Wetland Rules protect pool-breeding amphibian habitat. Pooling forested wetlands with no permanent inlets or outlets are presumed to be vernal pools and Class II unless an adequate breeding season survey indicates no amphibian breeding activity. When activities are proposed within 50 feet of a pooling wetland, wetland permitting requires the evaluation of the extent to which the wetland supports or provides habitat to support the reproduction of uncommon pool-breeding Vermont amphibian species and how the GSPL Project may affect the habitat. An evaluation cannot take place unless spring breeding and habitat condition information is available, which can only be obtained through field surveys during the spring breeding season.

Vernal pools are resources protected from unregulated alteration under the NHDES Wetlands law and rules. Specifically, the NHDES adopted rules (NH Administrative Rules Env-Wt) regarding vernal pools require that any standard application for a minor or major State wetlands permit, locate and delineate vernal pools and consider the impact of the proposed Project on vernal pools.

The USACE regulates vernal pools of both natural and non-natural origin. Additionally, the USACE regulates the terrestrial habitat around certain pools to a distance of 750 feet from the upper limit of the depression. To determine which pools the USACE will regulate generally requires back and forth discussions, including case-by-case descriptions of certain pools, with the USACE and U.S. Fish and Wildlife Service (FWS).

Because of their seasonal nature, vernal pool surveys will need to be conducted in the spring in accordance with agency-approved protocols. The presence of vernal pools within or near the proposed right-of-way could result in seasonal restrictions for construction in order to minimize or avoid potential impacts.

Rare, Threatened and Endangered Species Section 7(a) of the Endangered Species Act (ESA; Public Law 93-205, as amended) establishes a national program administered by the FWS for the conservation of threatened and endangered species of fish and wildlife and for terrestrial species and the ecosystems on which they depend. In Vermont there are three federally listed endangered species and four federally listed threatened species. In New Hampshire there are five federally endangered species and four federally listed threatened species.

The Vermont Fish and Wildlife Department (VFWD), Wildlife Diversity Program is responsible for monitoring, managing, and conserving nongame wildlife. This program includes the Natural Heritage Inventory (NHI), which documents the presence of rare, threatened and endangered (RTE) species, uncommon species, and natural communities in Vermont. The VFWD lists 36 endangered species and 16 threatened species under the Vermont statute for Protection of Endangered Species (10 V.S.A. § 5401 - 10); some of the State-listed species are also federally listed under the ESA. In addition, VFWD also maintains a list of species of special concern, which includes 3 mammals, 20

birds, 10 fishes, and 21 other species (VFWD 2015). Most of Vermont's nine bat species have been found in the vicinity of the proposed Project route and may occur near the Victory Basin WMA. Bats are a high conservation concern given recent dramatic population declines, but likely good habitats occur across the Victory Basin Wildlife Management Area (WMA) forests, wetlands, and other features (such as talus slopes, used by the small-footed bat).

Consultation was initiated with the VFWD on May 24, 2017 to determine if the GSPL Project would impact any federal or State-listed species. A response was received on May 27, 2017, indicating 17 RTE and uncommon species that have been documented within 1 mile of the existing HVDC centerline. Some of these species have been documented multiple times within the 1-mile buffer. The following tables present the RTE wildlife species that may be encountered along the proposed HVDC line in Vermont based on the response provided by VFWD, separated by federal and state status.

Table 7.3.4: Federal-Listed RTE Wildlife Species within 1 Mile of the Existing HVDC Centerline in Vermont

Common Name	Scientific Name	Federal Status ¹	VT State Status ²	VT State Rank ³
Mammals				
Canada Lynx	<i>Lynx Canadensis</i>	Threatened	Endangered	S1
Mussels				
Dwarf Wedgemussel	<i>Alasmodonta heterodon</i>	Endangered	Endangered	S1
¹ Legal protection under the federal Endangered Species Act, U.S. Fish and Wildlife Service ² Legal protection under the Vermont Endangered Species Law (10 V.S.A. Chap. 123) ³ Value that best characterizes the relative rarity (abundance) or endangerment of a native taxon throughout its range in Vermont: S1 = very rare				

Table 7.3.5: State-Listed RTE Wildlife Species within 1 Mile of the Existing HVDC Centerline in Vermont

Common Name	Scientific Name	VT State Status ¹	VT State Rank ²
Birds			
Great Blue Heron	<i>Ardea Herodias</i>	Rare	S3S4B
Rusty Blackbird	<i>Euphagus carolinus</i>	Endangered	S3B
Spruce Grouse	<i>Falciennus canadensis</i>	Endangered	S1
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Endangered	S1B,S4N
Gray Jay	<i>Perisoreus canadensis</i>	Rare	S2
Black-backed Woodpecker	<i>Picoides arcticus</i>	Rare	S2
Palm Warbler	<i>Setophaga palmarum</i>	Rare	S1B
Insects			
Boreal Long-lipped Tiger Beetle	<i>Cicindela longilabris</i>	Rare	S2
Harlequin Darner	<i>Gomphaeschna furcillata</i>	Rare	S2S3
Lake Emerald	<i>Somatochlora cingulata</i>	Rare	S1S2
Forcinate Emerald	<i>Somatochlora forcipata</i>	Rare	S2S3
Delicate Emerald	<i>Somatochlora franklini</i>	Rare	S1S2
Kennedy's Emerald	<i>Somatochlora kennedyi</i>	Rare	S1S2
Ocellated Emerald	<i>Somatochlora minor</i>	Rare	S2
Mussels			
Eastern Pearlshell	<i>Margaritifera margaritifera</i>	Threatened	S2
¹ Legal protection under the Vermont Endangered Species Law (10 V.S.A. Chap. 123) ² Value that best characterizes the relative rarity (abundance) or endangerment of a native taxon throughout its range in Vermont: S3S4B = uncommon to common breeder; S3B = uncommon breeder; S1 = very rare; S1B,S4N = very rare breeder, common in winter; S2 = rare; S1B = very rare breeder; S2S3 = rare to uncommon; S1S2 = very rare to rare			

The New Hampshire Fish and Game Department (NHFG), Nongame and Endangered Wildlife Program maintain a list of RTE species in New Hampshire. The NHFG lists 27 endangered species and 14 threatened species in New Hampshire, some of which are also federally listed. Consultation was initiated with the NHFG to determine if the portion of the proposed HVDC line that is located within New Hampshire would impact any federal or State-listed species.

Based on the results from the VFWD, presence/absence surveys for transient and mobile species may be required. It may be prudent to develop mitigation measures to limit incidental take during construction rather than trying to document their absence. Likely mitigation may require seasonal restrictions of certain activities, such as limiting tree clearing to the period between October 1 and March 31 in order to avoid bat roosting during the summer season.

Significant Wildlife Habitat The Vermont portion of the proposed Project route goes through the largest and second largest deer wintering areas in Vermont, as well as significant breeding habitat for numerous bird species, such as the spruce grouse (*Falciennis canadensis*), black-backed woodpecker (*Picoides arcticus*), boreal chickadee (*Poecile hudsonicus*), and gray jay (*Perisoreus canadensis*). Of the State's 17 Important Bird Areas (IBA), two occur along the proposed route: Nulhegan Basin and Victory Basin. Nulhegan Basin is an extensive boreal habitat of about 26,000 acres of forests and wetlands. Victory Basin consists of 1,500 acres of boreal habitat with forests and wetlands. Further, the Victory Basin WMA has been the site of a reintroduction effort for a number of rare and protected species including the spruce grouse, American marten, and Canada lynx, amongst other northern species. This particular extensive softwood basin also provides one of the largest deer wintering areas in Vermont.

It is likely that time of year restrictions on tree clearing will be required to minimize impacts to deer wintering areas, bird nesting habitat, and roosting habitat for bats.

Rare Plants and Communities The Vermont NHI maintains a database of native species and natural community observations which is used for conservation and land use planning. Each species and natural community is given a State rank, which best characterizes the abundance of the species or community within Vermont, or its endangerment throughout its range. Ranks designated are as follows:

- S1: the species or community is very rare and at a very high risk of extinction or extirpation
- S2: the species or community is rare and at a high risk of extinction or extirpation
- S3: the species or community is uncommon and at a moderate risk of extinction or extirpation
- S4: the species or community is common to uncommon (but not rare) and may have some cause for long-term concern
- S5: the species or community is common and is not of concern for extinction or extirpation

The response from the VFWD indicated that there are 30 RTE plant species that have been documented within 1 mile of the existing HVDC centerline. Some of these species have been documented multiple times within the 1-mile buffer. The following table provides the State-listed RTE plant species that may be encountered along the proposed HVDC right-of-way in Vermont. No federal-listed plant species are located within one 1 mile of the existing HVDC centerline, based on VFWD data.

Table 7.3.6: State-Listed RTE Plant Species within 1 Mile of the Existing HVDC Centerline in Vermont

Common Name	Scientific Name	VT State Status ¹	VT State Rank ²
Large Water-starwort	<i>Callitriche heterophylla</i>	Rare	S2
Emmon's Sedge	<i>Carex albicans</i> var. <i>emmonsii</i>	Rare	S1
Northeastern Sedge	<i>Carex cryptolepis</i>	Rare	S2S3
Shore Sedge	<i>Carex lenticularis</i>	Rare	S2S3
Muehlenberg's Sedge	<i>Carex muehlenbergii</i> var. <i>muehlenbergii</i>	Threatened	S2
Few-flowered Panic-grass	<i>Dichanthelium oligosanthes</i> ssp. <i>Scribnerianum</i>	Rare	S2
Ground-fir	<i>Diphasiastrum sabinifolium</i>	Rare	S2
Wright's Spikerush	<i>Eleocharis diandra</i>	Rare	S2
Marsh Horsetail	<i>Equisetum palustre</i>	Threatened	S2
Fir Clubmoss	<i>Huperzia selago</i>	Rare	S1
River-bank Quillwort	<i>Isoetes riparia</i>	Rare	S2
Tuckerman's Quillwort	<i>Isoetes tuckermanii</i>	Rare	S1
Greene's Rush	<i>Juncus greenei</i>	Endangered	S2
American Shore-grass	<i>Littorella Americana</i>	Rare	S2
Small-flowered Rush	<i>Luzula parviflora</i>	Rare	S2S3
Green Adder's-mouth	<i>Malaxis unifolia</i>	Rare	S2
Farwell's Water-milfoil	<i>Myriophyllum farwellii</i>	Rare	S2S3
Auricled Twayblade	<i>Neottia auriculata</i>	Endangered	S1
Bog Aster	<i>Oclemena nemoralis</i>	Rare	S2
Woodland Cudweed	<i>Omalotheca sylvatica</i>	Endangered	S1
Sweet Coltsfoot	<i>Petasites frigidus</i> var. <i>palmatus</i>	Threatened	S2
White-fringed Orchid	<i>Platanthera blephariglottis</i> var. <i>blephariglottis</i>	Rare	S2
Vasey's Pondweed	<i>Potamogeton vaseyi</i>	Rare	S2
Shining Rose	<i>Rosa nitida</i>	Rare	S2
Pod-grass	<i>Scheuchzeria palustris</i>	Threatened	S2
Trailing Stitchwort	<i>Stellaria alsine</i>	Rare	S2
Sticky False-asphodel	<i>Triantha glutinosa</i>	Threatened	S1
Northeastern Bladderwort	<i>Utricularia resupinata</i>	Threatened	S1
Mountain Cranberry	<i>Vaccinium vitis-idaea</i>	Rare	S2
Lance-leaved Violet	<i>Viola lanceolata</i> ssp. <i>Lanceolata</i>	Threatened	S1
¹ Legal protection under the Vermont Endangered Species Law (10 V.S.A. Chap. 123)			
² Value that best characterizes the relative rarity (abundance) or endangerment of a native taxon throughout its range in Vermont: S2 = rare; S1 = very rare; S2S3 = rare to uncommon			

The response from the VFWD indicated that there are 28 natural communities that have been documented within one mile of the existing HVDC centerline. Some of these communities have been documented multiple times within the 1-mile buffer. Of these 28 natural communities, five are crossed by the proposed HVDC line. The following table provides the natural communities that are crossed by the proposed HVDC line, the approximate acres of each community that is crossed, and the State rank of each community.

Table 7.3.7: State-Ranked Natural Communities Crossed by the Proposed HVDC Line in Vermont

Natural Community	Acreage Within the Proposed Right-of-Way	VT State Rank ¹
Dry Red Oak-White Pine Forest	1.6	S3
Lowland Spruce-Fir Forest	41.1	S3
Northern Hardwood Forest	174.5	S5
Northern White Cedar Swamp	1.8	S3
Red Spruce-Northern Hardwood Forest	51.8	S5
¹ Value that best characterizes the relative rarity (abundance) or endangerment of a native taxon throughout its range in Vermont: S3 = uncommon; S5 = very common		

Construction activity within the limits of RTE plant species spatial buffers or natural communities is strongly discouraged by regulators, and clearing for the expanded right-of-way will impact the uncommon forest communities identified above. Based on the results from the VFWD, rare plant surveys may be required.

Protected Avian Species Large numbers of birds migrate through, and breed in, northeastern Vermont's wetlands and forests. Abundance and species richness is lowest during the late fall and winter. Aside from significant wildlife habitats and protected species (including bald eagles), impacts to birds as a result of the GSPL Project are likely to be limited to potential impacts to nesting birds. The greatest potential for the Project to impact nesting birds is during clearing of vegetation during construction.

A total of 14 migratory birds and eagle species occur in the proposed Project corridor. Birds are protected by the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA). Take of migratory birds or eagles is prohibited, unless otherwise authorized by the FWS. Bird species of particular conservation concern that may be potentially affected by the GSPL Project include American bittern (*Botaurus lentiginosus*), bald eagle, bay-breasted warbler (*Setophaga castanea*), black-billed cuckoo (*Coccyzus erythrophthalmus*), Canada warbler (*Cardellina canadensis*), common tern (*Sterna hirundo*), olive-sided flycatcher (*Contopus cooperi*), peregrine falcon (*Falco peregrinus*), pied-billed grebe (*Podilymbus podiceps*), short-eared owl (*Asio flammeus*), upland sandpiper (*Bartramia longicauda*), willow flycatcher (*Empidonax traillii*), wood thrush (*Hylocichla mustelina*), and yellow rail (*Coturnicops noveboracensis*). All of these migratory birds occur along the proposed route for breeding, except the bald eagle, which is present year-round.

Although bald eagles are no longer a federally-listed species under the ESA, they remain a State-listed endangered species in Vermont and New Hampshire. At the federal level, the BGEPA is the primary law protecting eagles. BGEPA prohibits "take" of eagles without a permit (16 USC 668-668c). BGEPA defines "take" to include "pursue, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb" and prohibits take of individuals and their parts, nests, or eggs. The FWS expanded this definition by regulation to include the term "destroy" to ensure that "take" includes destruction of eagle nests. The term "disturb" is further defined by regulation as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause....injury to an eagle, a decrease in productivity, or nest abandonment" (50 CFR 22.3). Vermont currently hosts 21 territorial pairs of bald eagles; New Hampshire had 15 territorial pairs of bald eagles during the 2008 summer breeding season. Preferred habitat structure consists of open bodies of water with little human disturbance, along with large canopy trees or elevated sites for nesting, perching, and roosting.

Spruce grouse (State-listed, endangered in Vermont) are known to occur regularly on at least the northern part of West Mountain Wildlife Management Area (WMA). The large acreage of West Mountain WMA coniferous forests and swamps allows several boreal bird species to live and breed in the area. About 94 species were recorded as breeding birds in the WMA. These species, which in Vermont are uncommon to rare outside of the Northeast Kingdom region, include the gray jay, black-backed woodpecker, boreal chickadee, rusty blackbird (*Euphagus carolinus*), and the Tennessee, Cape May, Wilson's, and bay-breasted warblers. In addition, the spruce grouse breeds in the northern extremity of West Mountain WMA and has been seen elsewhere on the property. West Mountain WMA provides an important potential link for dispersal and genetic exchange between the only two populations of spruce grouse in Vermont—the wild population at Wenlock WMA and an introduced population in Victory Basin WMA.

Numerous species of birds that occur on the Victory Basin WMA are of conservation concern, including the black-backed woodpecker, gray jay, Bicknell's thrush (*Catharus bicknelli*), boreal chickadee, spruce grouse and rusty blackbird. Most of these rare species are "boreal birds" that occur mostly in the spruce-fir forests of Canada. Both the Victory Basin WMA and Nulhegan Basin are the only two extensive lowland spruce-fir forests in Vermont. As such, they provide a rare habitat for these birds. The Nulhegan Basin area not only provides important stopover habitat for migrating landbirds, but breeding habitat as well.

Nulhegan Basin supports resident and migratory boreal species including boreal chickadee, black-backed woodpecker, spruce grouse, gray jay, bay-breasted warbler, rusty blackbird, and olive-sided flycatcher. The contiguous forests in the Nulhegan Basin area also provide habitat for forest interior species such as Canada warbler, ovenbird (*Seiurus* sp.), blackburnian warbler (*Setophaga fusca*), black-throated blue warbler (*Setophaga caerulescens*), and black-throated green warbler (*Setophaga virens*). Blackburnian warbler, Canada warbler, and black-throated blue warbler are Priority Refuge Resource of Concern species that require different plant species composition and structure within a mature forest.

Forest clearing for right-of-way expansion will pose the most significant impact to protected avian species by reducing potential habitat. Eagle nest surveys may be required, particularly in the area of the Connecticut River crossing and along the shoreline of Comerford Reservoir, to document potential breeding activity that may be disrupted by right-of-way clearing and other construction activities.

7.3.vi. Land use impacts

The GSPL Project is located in an area of Vermont known as the Northeast Kingdom, which can be characterized as remote and generally undeveloped. The Northeast Kingdom represents 21% of the Vermont land area but contains only 10% of the state's population. Three counties – Caledonia, Essex and Orleans – comprise the Northeast Kingdom and the proposed HVDC line in Vermont traverses Essex and Caledonia counties with approximately 86% of the proposed HVDC line located in Essex County. According to the Regional Plan for the Northeast Kingdom (2015), approximately 95% of Essex County and 83% of Caledonia County is forested, most of which is private timberland. Cropland and pasture represent only 2% and 7% of the land area in Essex and Caledonia counties, respectively.

South of the Connecticut River, the HVDC right-of-way in New Hampshire crosses a mix of forest

land and conservation lands along the Connecticut River and some agricultural land.

A large portion of the proposed HVDC route crosses various conservation lands in Northeast Vermont, including the Silvio O. Conte National Fish and Wildlife Refuge – Nulhegan Basin Unit, the West Mountain Wildlife Management Area, and the Victory State Forest. Because the existing Phase I HVDC line was built before these conservation lands were established, the existing fee-owned right-of-way is not technically included as part of these conservation lands even though the conservation lands surround the existing right-of-way. Public access for recreational purposes is widely held as an important component of land management in northeastern Vermont and most of the conservation lands described above have public access easements.

Assuming 90% of the HVDC right-of-way in Vermont is bounded by forest land, a new overhead HVDC line would require the clearing of approximately 850 acres of forest land. Additional right-of-way acquisition will require negotiations with federal, state and private land conservation organizations. During construction recreational use of the existing HVDC right-of-way will be precluded; however, recreational use can resume following construction.

7.3.vii. Cultural resources

Cultural resources include archaeological sites, historic standing structures, objects, districts, and traditional cultural properties that illustrate or represent important aspects of prehistory or history, or that have important and long-standing cultural associations with established communities or social groups. Significant archaeological and architectural properties are generally defined by the eligibility criteria for listing in the National Register of Historic Places (NRHP). Section 106 of the National Historic Preservation Act (NHPA) requires the identification of and consultation over NRHP eligible sites with State Historic Preservation Offices and federally recognized Native American tribes.

Archeological and Historical Resources A review of available online and GIS databases indicated that no historic or culturally sensitive resources have been mapped within one-half mile of the existing HVDC line right-of-way. As the GSPL Project moves forward, a Phase 1 cultural resource review will likely be prepared in consultation with the State Historic Preservation Officers (SHPO). These reviews include a comprehensive desktop assessment, site reconnaissance survey, and archeological investigations (i.e., shovel test program) along areas planned for expansion. Given the rural and remote location of the GSPL Project and the existing transmission line, impacts to above-ground historic structures is anticipated to be minimal. Areas that are determined to be potentially significant for cultural resources, in consultation with SHPOs and Native American tribes, may require follow up investigation or other form of avoidance or mitigation to be determined on a case-by-case basis.

Potential Native American Interests There are no federally recognized tribes resident in Vermont or New Hampshire. National Park Service (NPS) and Housing and Urban Development (HUD) databases do not identify any federally recognized tribe as having potential cultural resource interests in New Hampshire.

The State of Vermont through legislative acts has formally recognized four groups as Native American tribes in the State:

- Elnu Abenaki Tribe
- Nulhegan Abenaki Tribe

- Koasek Traditional Band of the Koas Abenaki Nation
- Abenaki Nation at Missisquoi.

The State of New Hampshire does not formally recognize any Native American tribes, but a list of tribal contacts prepared by the New Hampshire Division of Historic Resources lists two non-recognized groups in New Hampshire:

- Abenaki Nation of New Hampshire
- Cowasuck Band – Pennacook/Abenaki People

Federal involvement with the permitting (DOE Presidential Permit and possibly USACE) may necessitate consultation regarding field investigation and evaluation of cultural resources, both known and potentially eligible for listing on the NRHP, depending on interest from Native American tribes and the agency's policies for consultation.

7.3.viii. Previous site use (e.g., greenfield, brownfield, industrial, etc.)

The proposed GSPL Project would be collocated adjacent to an existing HVDC right-of-way in Vermont and New Hampshire. Land within the area proposed for the expanded ROW is primarily undeveloped forest, open, or agricultural lands. Agricultural activities and recreational activities will be able to resume within the existing and expanded right-of-way after construction. There are no known liabilities or environmental conditions in the proposed expanded right-of-way that would cause environmental impacts due to construction of the proposed Project.

The proposed Norton converter station will be located on currently undeveloped, forested land adjacent to the existing HVDC right-of-way in the town of Norton, Essex County, Vermont. There are no known liabilities or environmental conditions that would encumber or limit development of the converter station at this location.

The proposed Monroe converter station will be located on currently undeveloped, partially forested land near the site of the former Phase I HVDC converter station and the Monroe Substation. Due to the current and former nearby utility uses, a Phase I environmental site assessment (ESA) was conducted for the proposed Monroe converter station site. The main objective of the Phase I ESA is to identify recognized environmental conditions (RECs) and environmental concerns that may affect the suitability of the site as an industrial and commercial facility. The Phase I ESA included a review of federal, state, and local records, previous reports, and historical documents; and visual observation of the site and adjoining properties. The Phase I ESA identified several RECs including: an empty 55-gallon drum (former contents unknown); an abandoned farm equipment/farm refuse dump; and two entries within the Emergency Response Notification System (ERNS) database (a national database used to collect information on reported releases of oil and hazardous substances) for an adjacent utility property. None of these RECs are expected to encumber or limit the development of the Monroe converter station at this site.

7.3.ix. Noise level impacts

Noise impacts may result during construction and operation the GSPL Project. Construction of the transmission line would generate temporary noise. Construction noise will occur along the GSPL Project route and access roads and at conductor pulling sites and staging and maintenance areas. Though Project construction would occur over a number of months, most overhead transmission line construction activities would last only days or a few weeks at any one location and would occur

during daylight hours (night work is not be anticipated), thereby limiting the impacts on any nearby receptors. Additional noise sources may include commuting workers and trucks moving material to and from the work sites. The construction equipment to be used is similar to that used during typical public works projects and tree service operations. Construction sound would attenuate with increased distance from the right-of-way. Other factors, such as vegetation and terrain would also act to further limit the impact of construction noise levels.

Operational noise emissions of overhead transmission lines can include corona discharge noise. Corona is the breakdown of air into charged particles caused by the electrical field at the surface conductors. Foul weather (rain, snow, sleet, or even high relative humidity levels) can lead to conditions favorable for a large number of corona discharges and subsequently noise. In contrast, corona noise generated during fair weather conditions (i.e., low humidity or no precipitation) is substantially lower. During foul weather there is the potential for the GSPL Project transmission line to generate audible noise and the level of audible noise would vary based on the distance from the line and other existing sound sources in the area. In addition, during foul weather such as rain there is also usually other ambient noise generated from interaction of rain with the surroundings, which would create a masking effect. Receptors would also not typically be outdoors or have their windows open in such conditions; therefore, exposure would be reduced. Noise generated by transmission lines typically contribute little to area noise levels when compared to other common sources.

The proposed HVDC converter stations at Norton and Monroe will generate noise during operation. The level of noise is dependent on the site layout and design including the incorporation of noise mitigation measures. Noise sources associated with HVDC converter are typically the same or very similar to those in AC substations. Converter stations can include equipment such as transformers, transformer coolers, shunt reactors, shunt reactor coolers, valve cooling fans, capacitors, and air handling units, as well as back-up generators for emergencies. Transformers are the primary sources of audible noise from operating substations and converter stations.

Along the Project route, ambient noise levels vary due to existing land uses, population density, and proximity to transportation corridors. Considering the remote and rural nature of the proposed transmission line corridor, ambient noise levels are anticipated to be at the lower end of the spectrum; however, this also means that there will be few noise-sensitive land uses and potential receptors. Nevertheless, to minimize impact resulting from converter station noise, GridAmerica will voluntarily adopt World Health Organization (WHO) Night Noise Guidelines for Europe published in 2009. During the design phase, different site layout configurations can be investigated to optimize shielding from on-site structures/equipment. For instance, noise mitigation measures such as use of barrier walls and/or enclosures or installing low noise fans or fan silencers can be implemented to aid in attenuating converter station sound sources. Ambient noise monitoring and modeling of potential sound levels during facility operation will be necessary to ensure potential operational noise impacts are minimized through facility siting and design. If additional noise mitigation is necessary, GridAmerica will work with the affected parties to reduce impacts to off-site receptors (i.e., residences).

Noise generated during routine inspection and maintenance of the GSPL Project is considered to be minor.

7.3.x. Aesthetic/visual impacts

The extent of potential visual impacts will be a function of landscape quality, presence and proximity of aesthetic resources, number of potential viewers and the physical changes and appearance of the proposed Project. One factor that will mitigate the potential visual impacts is the presence of the existing HVDC line. The varied topography, predominant forest cover and remote setting limit the visual impact of the existing HVDC line, and the proposed Project will result in only an incremental change.

The new HVDC line will require the additional clearing of approximately 150 feet of right-of-way, which would be a noticeable difference from those viewpoints that provide an extended view of the existing right-of-way, such as at the crossing of State Route 18/135 in New Hampshire, which offers a view of the Connecticut River crossing and the right-of-way to the north. Forest cover and few road crossings limit the opportunities to view the existing HVDC line and will similarly limit the potential visual impacts of the proposed HVDC line.

The proposed Norton converter station site is located in a remote area and will be more than 1,000 feet from Route 114, which would provide the nearest public viewing location. Considering the distance and forested land that would surround the converter station and the adjacent HVDC line, potential visual impacts from the Norton converter station are expected to be insignificant.

The proposed Monroe converter station site is located in a generally agricultural area near other utility facilities including various electric transmission lines, the former HVDC converter station, and the existing Comerford Substation. The Monroe converter station will be located approximately 800 feet from Route 135 and a forested buffer may be maintained to provide screening from nearby public viewing locations. Considering the other nearby utility facilities, the distance from public viewing locations and the likely forested buffer, potential visual impacts from the Monroe converter station are expected to be insignificant.

7.3.xi. Transmission infrastructure impacts

See the above-responses to 7.3.i through 7.3.x. The GSPL Project will interconnect at the border with the HQT transmission system and will enable the import of up to 1200 MW of clean, renewable energy from the province of Quebec in Canada to the New England power grid. The GSPL Project is also expected to lower energy costs for Vermont and New Hampshire by \$487 million and \$1.4 billion respectively, and by a total of \$7.8 billion across New England over its first 10 years of operation (see Section 13, *Attachment 13.3 (confidential) – ESAI GSPL Report 2017*).

An interconnection request has been submitted to the Independent System Operator for New England (ISO-NE) in accordance with their procedures. A system impact study will be conducted by ISO-NE to determine the additional system upgrades that would be needed to enable the interconnection of the GSPL Project with the New England electric transmission grid.

7.3.xii. Fuel supply access, where applicable

The GSPL Project will enable the import of clean, renewable energy from Canada to the New England power grid. Access to fuel supply is not applicable to the GSPL Project.

Mistissini Project

A Preliminary Environmental Assessment undertaken by an independent consultant, Activa Environnement, is presented below. Additional information on the Project, the environmental process and environmental data are included in the report provided as *Attachment 7.3. 1 (confidential) – Mistissini Preliminary Environmental Assessment*.

This assessment identifies potential environmental and social impacts of the Project, as well as key mitigation measures to minimize these impacts. According to current information on the Project area's characteristics and local regulations, as well the Cree's support of RES Canada and this Project, no fatal flaw has been identified.

Environmental Assessment Process under JBNQA

Based on other experience with projects under the JBNQA, the following sections present the work specific to northern projects that will likely be required to fulfill the requirements of the Guidelines to be developed by COMEV.

a) Land Use, Development and Tenure

The social component baseline study will document the objectives, specific measures or guidelines set out by the Cree Nation of Mistissini in their land use and development plans and the regional development plans, and in the regional development plans and regulations of the James Bay region. It is expected that tallymen whose traplines overlap the proposed Project area will be interviewed to gather information about the current use, management and planned use of the traplines. The neighboring tallymen will be interviewed to complement this information if necessary.

A land use analysis will be conducted for the zone that will be directly impacted by the wind farm project within the trapline under consideration and, more generally, for the Cree Nation of Mistissini. The land use analysis will document and map (i) current and past traditional activities, including but not limited to fishing and hunting activities; (ii) the location and spatial extent of natural resources harvesting, recreation and tourism activities; (iii) key transportation systems and networks; and (iv) major urban and regional infrastructure and public services. The baseline study will also document land tenure and the system of land administration and management, with particular reference to potential impacts within the immediate vicinity of the Project. Within the immediate vicinity of the Project, all available information regarding the presence and significance of any sites of historic, religious or cultural importance will be compiled.

Seasonal activities and uses by tallymen, members of the Cree Nation of Mistissini, and other users, will be documented, with a special focus on fishing and hunting activities. The traditional environmental knowledge (TEK) provided by the tallymen and other members of the Cree Nation of Mistissini related to fish habitat, fish populations or other biophysical components will be shared with the ESIA team. This information will be used to assess potential impacts from the construction and operation of the wind farm, and to propose mitigation measures.

b) Archaeological Screening and First Nation Communities

An archaeological potential study will be carried out. All available data within 20 km of the study zone will be compiled. The data will be obtained from sources such as : the Cree Nation of Mistissini, the Inventory of Quebec archaeological sites at the Ministry of Culture, Communications

and Women's Affairs (*Inventaire des sites archéologiques du Québec (ISAQ) du ministère de la Culture, des Communications et de la Condition féminine*), Quebec's Directory of Cultural Heritage (*Répertoire du patrimoine culturel du Québec*), Macro-inventory of Quebec's heritage (*Macro-inventaire du patrimoine québécois*) and Quebec's Directory of archaeological potential studies (*Répertoire québécois des études de potentiel archéologique – RQÉPA*).

Historical documentation (archives, old maps, etc.) will also be considered in order to detect the presence of heritage sites for First Nations or Canadians of European origin. Concerning pre-historical sites, an occupation model will be produced based on characteristics from known archaeological sites. Areas containing or likely to contain archaeological sites within the study zone will be mapped.

RES Canada will compile and analyze the principal issues and concerns of different groups within the Cree Nation of Mistissini through interviews and consultations with key informants and other stakeholders, especially the local tallymen. The interview and consultations will enable RES Canada to gather information with respect to opportunities to share in the benefits of the project, as well as to minimize and manage potential adverse impacts. Community participation and consideration of opinions will be important to ensure the social acceptability of the project.

Summary of the impacts on major environmental areas

i. Impacts during site development

The development of this project has been going on for seven years. There were a few site visits that took place between 2010 and 2017. It involved specifically the installation of meteorological masts and environmental baseline studies. All of these visits were conducted under protocols that included best practices in terms of waste management and environmental protection. Anticipated activities during the continuation of this development phase will include environmental studies and geotechnical studies. Overall, impacts during site development are expected to be not significant.

ii. Transportation infrastructure

The circulation of heavy and oversized vehicles to transport equipment could damage local and regional roads used. Should any damage be caused by wind farm construction, RES Canada will carry out repair work on sections that were used. They will be restored to a condition equal or superior to their condition prior to construction of the wind farm. Transportation activities will comply with the applicable regulations, and safety measures will be implemented if necessary. Common mitigation measures such as speed limitations around work sites, implementation of road signs, coordination and communication of the transport plan with other users will be implemented during construction. It is expected that the impact on transportation infrastructure during construction will be not significant.

Due to the very low level of traffic during operations (generally limited to O&M activities), it is expected that the Mistissini Project will have no impact on transportation infrastructure during this phase.

iii. Air quality impacts

During the construction, transportation and traffic may raise dust on unpaved roads. Routine mitigation measures, such as reducing vehicle speed and using dust suppressants, will be

implemented to limit temporary dust emissions. Therefore, it is expected that the impact on air quality during the construction will be not significant.

Due to the very low level of traffic during operations, it is expected that the Mistissini Project will have no impact on air quality during this phase.

iv. Access to water resources/water quality impacts

Road construction and the installation or improvement of watercourse crossings can modify the flow of water and introduce sediment to watercourses. To reduce this impact to a minimum, existing roads will be used most often, and road routes will be planned so as to reduce the number of watercourse crossings needed. Common mitigation measures and specific mitigation measures will include setbacks of 60 m (196.85 f.) from watercourses for any work sites, implementation of settling basins along road drainage; and adaptation of culvert design to the specifications of the watershed. Following the implementation of all the relevant mitigation measures, it is expected that the impact on water resources/water quality during the construction will be not significant.

Due to the very low level of traffic during operations, it is expected that the Mistissini Project will have no impact on water resources/water quality during this phase.

v. Ecological and natural resources impacts

The impact on ecological and natural resources are summarized for the key significant components of the project area : 1) forest stands; 2) birds; 3) bats; 4) fish; 5) large mammals.

Forest stands: Tree clearing prior to construction of the wind farm will lead to rejuvenation of the forest or loss of productive forest throughout the various types of forest stands. Given the nature of the stands that will be cleared for construction of the wind farm and the forestry vocation of the area where turbines are located, and considering that, as a specific mitigation measure, RES Canada will coordinate the wood clearing activities to harmonize it with the wood clearing plans of the wood industry enterprises operating in the area, it is expected that the impact on forest stands during the construction will be not significant. It should be noted as well that the overall footprint of the Project is considered to marginal compared to the total project area.

As the operation of the wind farm will not require any wood clearing, no impact on forest stands is anticipated during wind farm operation.

Birds : During the construction phase, some activities may disturb birds, primarily nesting birds, due to the noise generated by the presence of workers and machinery. Disturbance will cease once the activities are over. Given the limited size of the area to be cleared and the availability of nearby alternative habitats, and considering that RES Canada will apply the common mitigation measures (avoid wood clearing during nesting season; respect a 500m setback from any observed endangered species), it is expected that the impact on bird populations and habitats during the construction will be not significant.

Based on RES Canada experience in Quebec, the impact on bird population and habitat during wind farm operation should be not significant as well. Nevertheless, it is expected that post-construction bird monitoring will be conducted for the first two to three years of operation.

Bats : Construction activities and the presence of workers and machinery can be sources of disturbance for bats. Given the size of the sites to be cleared and the availability of nearby alternative habitats, and considering that RES Canada will apply the common mitigation measures (avoid work in close proximity of a bat hibernaculum), it is expected that the impact on bat populations and habitats during the construction will be not significant.

Based on RES Canada experience in Quebec, the impact on bat population and their habitat during wind farm operation should be not significant as well. Nevertheless, it is expected that post-construction bat monitoring will be conducted for the first two to three years of operation.

Fish : Road construction and the installation or improvement of watercourse crossings can have a potential impact on fish habitat, by adding sediment to watercourses. To reduce this impact to a minimum, existing roads will be used most often, and road routes will be planned as to reduce the number of watercourse crossings needed. Worksites will be located at 60 m (196.85 f.) from watercourses. Near watercourses, sediment settling basins will be built to divert water from ditches to areas with vegetation. Watercourses will be characterized in order to ascertain whether there are spawning sites downstream from the crossings that will need to be upgraded, and if so, to protect them. Other specific mitigation measures will include the adaptation of culvert design to the specifications of the watershed and fish species and habitats. Given all these elements, it is expected that the impact on fish and their habitats during the construction phase will be not significant.

As the operation of the wind farm does not interact with water habitat, no impact on fish population and habitat is anticipated during wind farm operation.

Large mammals: Activities during the construction phase can modify moose and woodland caribou habitat. By locating the infrastructures of the project outside and at an adequate distance from wintering habitats of these species, and by planning consultation with Cree tallymen, RES Canada will ensure that the impact on these species will be not significant during construction.

Based on experience from other wind farms, large mammals are not disturbed by turbines and return to the area after construction. It is expected that the impact on large mammal populations will be not significant during wind farm operation.

vi. Land use impacts

The project infrastructure is located on remote and uninhabited Public land. More specifically, there are no land leases for cabins, hunting camps or outfitting activities on the Project area. This situation is a result of the JBNQA that prevented the Quebec's Government to grant leases after JBNQA was passed. Therefore, the wind farm development, construction and operation interact with a much more limited number of other land uses than for a typical project on Quebec public land.

The LOI prescribes specific harmonization measures with other land uses already leased by MENR. Currently, only one land lease is located to the west of the Project area. As a preventive mitigation measure, RES Canada has applied a minimum 500 m (1650 ft) turbine setback from this lease and a 1500 m (5000 ft) visual harmonization zone around this lease. RES Canada has an excellent track record regarding this kind of harmonization measure to the satisfaction of other users. Other land uses include traplines that are located inside the Project area. A Traditional Environmental

Knowledge (TEK) study described previously will be undertaken to identify any potential mitigation measures to minimize impact on traplines. During this TEK study, the tallymen that are involved in the management of these traplines will be consulted and their inputs will be translated into harmonization measures. Given the characteristics of the Project area and the application of specific mitigation measures, it is expected that the impact on land uses during construction will be not significant.

It should be noted as well that the project area does not include any conservation lands, and all Project infrastructure avoid known protected areas.

As the operation of the wind farm will not generate new activities and should not increase attendance and traffic on the territory, it is expected that the impact on land uses during operation will be not significant.

vii. Cultural resources

RES Canada will compile and analyze the principal issues and concerns of different social groups within the Cree Nation of Mistissini through interviews and consultations with key informants and other stakeholders, especially the local tallymen. The interview and consultations will enable RES Canada to gather information with respect to opportunities to share the benefits of the Project, and to minimize and manage potential adverse impacts. Community participation and consideration of opinions will be important to ensure social acceptability. The following is a preliminary list of groups and individuals whom we intend to consult about TEK regarding the land and people who may be affected by the project:

- Cree Regional Authority and the Regional Cree Environmental Administrator
- Band Council of Mistissini and the Local Environmental Department
- Mistissini Cree Trapper Association
- Mistissini Youth Association
- Mistissini Women Association
- Mistissini Tourism Office
- Mistissini Public Health Department
- Mistissini Cree Human Resources Development
- Mistissini Director General
- Mistissini Director of Social Development
- Mistissini Director of Community Development
- Mistissini Coordinator of Cultural Affairs
- Mistissini Coordinator of Economic Development

Based on this consultation process, RES Canada is confident that cultural heritage features will be well identified, characterized and mitigated. Therefore, it is expected that the impact on cultural heritage during construction and operation will be not significant.

viii. Previous site use (e.g., greenfield, brownfield, industrial, etc.)

The site has always been used for logging and for First Nation activities (fishing, hunting and trapping). These land uses will remain unchanged. The specific mitigation measure will be to conduct the Traditional Environmental Knowledge (TEK) study described previously. Given the characteristics of the Project area and the application of specific mitigation measures, it is expected that the impact during construction will be not significant.

As the operation of the wind farm will not generate new activities and should not increase attendance and traffic on the territory, it is expected that the impact on previous site uses during operation will be not significant.

ix. Noise level impacts

Construction activities may increase ambient noise levels. This increase is mainly due to transportation activities and to the use of heavy machinery to carry out the work. Construction activities will be restricted to worksites and access roads. A monitoring program will be put in place in order to guarantee that the noise levels respect the Quebec guidelines for construction noise, i.e. a 12 hours average of 55 dBA ($L_{aeq\ 12h}$) during daytime and a 1 hour average of 45 dBA during evening and night time ($L_{aeq\ 1h}$). It is expected that the Project will comply to the guideline.

Operation of the wind farm will also need to comply to noise guidelines and best practices. Overall, given the absence of permanent and seasonal dwellings on the Project area, it is expected that noise impacts will be not significant.

x. Aesthetic/visual impacts

As mentioned previously, a specific feature of the Public land in the project area is that there is no land leases for cabins, rustic camps or outfitting activities. Therefore, there are a very limited number of users on this territory. As a preventive mitigation measure, RES Canada has applied a 1500 m (5000 ft) visual harmonization zone around the lease located to the west of the Project area. It is a very remote site and the expectation in terms of visual quality should be quite simple to accommodate. However, RES Canada will conduct its consultation, especially via the TEK study. This process could eventually lead to the implementation of specific mitigation measures. Meanwhile, RES Canada will conduct a visual analysis of the project including the production of a “Zone of visual influence” map and the preparation of visual simulations.

Overall, visual impacts of the Project are expected to be not significant, given the remoteness of the site and the absence of permanent and seasonal dwellings.

xi. Transmission infrastructure impacts

HQT will be responsible for the environmental assessment of the 161 kV transmission line that will connect the Project’s substation to the HQT grid. On a preliminary basis, it is expected that the line will have minimal impact on the environment, given its limited length of 8.5 mile and its location, which will likely follow an existing roadway. As per HQT best practices, the siting and design of the transmission line will aim to minimize impacts on valued environmental components, as per the Quebec environmental assessment process under the EQA. Currently, the expected path of the transmission line is expected to have minimal impacts as it will not cross watercourses, wetlands or waterbodies and it is not located near any existing residences. Tree removal will however be required to provide a corridor for the line.

xii. Fuel supply access, where applicable

The Project is a wind energy project and will not require fuel supply.

Vauban Project

A Preliminary Environmental Assessment undertaken by an independent consultant, DNG-GL is presented below. Additional information on the Project, the environmental process and environmental data are included in the report provided as *Attachment 7.3. 2 (confidential) – Vauban Preliminary Environmental Assessment*.

This preliminary environmental assessment identifies potential environmental and social impacts of the Project, as well as key mitigation measures to minimize these impacts. According to current information on the Project area's characteristics and local regulations, no fatal flaw has been identified.

i. Impacts during site development

Project activities during the site development phase include the installation of new meteorological masts to monitoring the wind resource, and the realization of biological inventories and geotechnical studies.

Mast installations and geotechnical studies may require limited tree cutting; however, they are considered marginal compared to current forestry activities within the project area.

For clarity, project impacts during the construction, operations and decommissioning phases are discussed in the following sections.

ii. Transportation infrastructure

The project area comprises a variety of roads and highways, most of which are local unpaved roadways primarily used for forestry and recreational purposes. To limit impact, the access road network was designed to use existing roads to the extent possible and upgrade, as necessary, to the benefit of local users. Circulation of trucks and other heavy vehicles could potentially damage access roads; however, all damages resulting from the project would be the responsibility of RES Canada, as needed.

Provincial Highway Route 289 traverses the project area. Although this road will provide primary access to the Project, no impact is anticipated on this important regional highway. As per the MRC regulation, wind turbines will not be located within 750 m of the road right-of-way. No impact on transportation infrastructures is anticipated during the operations phase.

iii. Air quality impacts

Air quality in southern Quebec and in the region of the project is generally good. Construction-related activities, including stripping of topsoil, road construction and upgrading, installation of infrastructure and electrical lines, as well as restoration of the project area, can potentially create dust emissions and temporarily increase particulate matter concentrations. Additionally, transportation of the project equipment, as well as the traffic generated by workers may also create minor and local dust emissions, particularly on the unpaved roads that will be used to access the

turbine sites. However, no significant concentrations of dust emissions that could affect air quality for a long period of time are anticipated.

The effect of these activities is also limited only to the project area which is a largely forested area with a notably low population density. It should be noted as well that no permanent residences are found near the project facilities. Thus, while dust could theoretically affect temporary users of the project area, it is unlikely that they will be frequenting the site during construction or decommissioning phases.

Dust could affect workers' health and safety on the project area's unpaved roads and construction sites, namely by increasing particulate matter concentrations, reducing visibility and creating the potential for accidents. To reduce the effect of dust emissions, the following mitigation measures are generally applied:

- Limit vehicle speeds on unpaved roads; and
- Utilize water or a water-based dust suppressant to control dust on unpaved roads in summer months.

While a detailed life-cycle assessment has not been done in the context of this preliminary environmental assessment, greenhouse gas (GHG) emissions associated with the construction, operation and decommissioning of wind energy projects are completely offset by the Project's reduction of GHGs on the electrical grid; in fact, all GHG emissions are offset by less than one year of wind operation. As such, despite the temporary and minor dust emissions anticipated to be generated during the construction phase, the project is expected to have an overall positive impact on air quality.

iv. Access to water resources/water quality impacts

Due to the rugged topography, the hydrology of the project area is characterized by a dense network of streams and a series of small lakes or wetlands. No residence is located within the vicinity of the proposed Project area and associated infrastructure. The nearest potential water well is located approximately 1.4 km from a proposed wind turbine location.

The project will comply with the following regulations and guidelines to minimize erosion and the impact on water resources during construction:

- Policy on the protection of riverbanks, shore areas and floodplains (chapter Q-2, ar.2.1) (chapter Q-2, r.35);
- Regulation on groundwater resources (chapter Q-2, r.6);
- Regulation on drinking water quality (chapter Q-2, r.40);
- Installation of bridges and culverts in wooded areas (1997).

v. Ecological and natural resources impacts

The majority of the project area is forested, consisting of a mix of coniferous and deciduous stands of various ages, with some patches at different stages of regeneration due to logging activities. There are also a few small lakes and many streams and wetlands of various sizes within the project area. According to governmental sources, the project area comprises protected areas (wildlife refuges, experimental forests and exceptional forest ecosystems), as well as other sensitive areas

such as mature forests and potential habitats of legally protected species. Legally protected wildlife and flora species including raptors and bats can also potentially be found in the project area. However no conservation lands are found in the project area.

Vegetation clearing and water works (stream and wetland crossings) are the two activities that are most likely to impact ecological and natural resources during the project's construction phase. As a result of this, careful siting of project infrastructure will aim to avoid protected habitats and minimize impacts to other sensitive areas, including watercourses and wetlands. Construction activities will be scheduled to reduce impacts to time- or period-sensitive wildlife species. A monitoring and mitigation plan will be implemented throughout construction, including activity monitoring by qualified biologists. A site restoration plan will also be implemented to ensure that temporary construction areas are restored to their natural state.

During operations, the most likely potential impacts to ecological and natural resources are bird and bat collisions with the turbines. A bird and bat conservation strategy will be implemented to ensure that appropriate post-construction mortality monitoring is conducted and that adaptive management measures are applied, in consultation with, and to the satisfaction of, the MFFP.

vi. Land use impacts

The project is located entirely on public land that can be characterized as remote and generally undeveloped. Most of the project area is forested with some cleared patches due to logging. Streams, wetlands and a few small lakes are also present within the project area. Industrial land uses on the site are limited to logging. The project area includes maple groves which could potentially be commercially exploited. Recreational uses on the site include seasonal cottages, snowmobile and quad trails, and hunting and fishing.

Most impacts to land use are expected to occur during the construction phase and include disturbance to recreational, commercial and industrial users. However, careful planning of the project will aim to avoid all identified sensitive habitats and turbines and other infrastructure will be appropriately setback from cottages and known recreational trails. The public and local stakeholders, such as forestry companies and maple syrup producers, will also be consulted. Construction plans and schedules will be provided to stakeholders and regulatory bodies for comment and recommendations to minimize impacts and employ acceptable and effective mitigation strategies. A site restoration plan will also ensure that temporary construction areas are restored. During operations, given the project's very limited footprint on the total project area, industrial and recreational uses are expected to resume to pre-construction levels with negligible change. As a result, the overall impact to land use is expected to be non-significant.

vii. Archaeological and cultural resources

Construction activities such as stripping of topsoil, road construction and upgrading, installation of infrastructure and electrical lines can potentially disturb archaeological resources.

A variety of project area characteristics suggest that archaeological resources could be present, including dominant viewpoints, proximity to watercourses, lakes, and potable water sources, as well as the abundance of natural resources (hunting and fishing grounds, firewood, etc.). A Phase 1 archaeological study will be conducted by a professional archaeologist to determine if there are areas of archaeological potential within the project area.

A Phase 2 archaeological study will be conducted if project infrastructures are planned to be located within identified areas of archaeological potential. The objective of this study will be to determine whether archaeological resources exist at the proposed location of the project infrastructure. If archaeological resources are identified and relocation of the Project infrastructure is not feasible, a Phase 3 study will be conducted to determine whether the archaeological resources are of significant heritage value. Due to the flexibility offered by the large size of the project area, it is anticipated that impacts on archaeological resources will be avoided through micro-siting efforts.

Cultural heritage encompasses elements that are important to past architectural, historical, ethnological, or aesthetic developments. These elements are inventoried by either the Canadian or Quebec government or by heritage conservation societies. Cultural resources can be protected by land use plans or by the local community. Generally speaking, cultural resources include historical sites and monuments, old buildings, and sites of religious importance. A review of the development plan, municipal regulations, and of the Quebec and Canada heritage inventories pointed to no sites of cultural importance within 10 km from the project.

viii. Previous site use (e.g., greenfield, brownfield, industrial, etc.)

The project area has been historically used for logging. A large portion of the site has been logged between 1970 and 1990. DNV GL is not aware of other industrial uses.

ix. Noise level impacts

As the project area is relatively remote and human presence is rare, ambient noise consists mostly of wildlife (birds, insects, frogs, etc.), wind and watercourses. Noise from traffic and construction activities will temporarily increase noise levels near access roads and around work sites and may disturb nearby recreational users and wildlife. Turbine noise emissions will increase ambient noise levels locally during operations.

An ambient noise measurement campaign will be conducted to better understand noise levels in the project area. A Noise Impact Assessment (NIA) will also be conducted as part of the environmental approval process. The objective of this assessment is twofold:

- Confirm the sound level limit requirements for the project by providing an assessment of the existing baseline environmental noise conditions in the vicinity of the wind farm; and
- Predict the noise levels generated by the project at all Points of Reception (PoR) where predicted sound levels are above 30 dBA.

Except for possible roadwork, construction activities will generally not be located near residences or cottages. Also, construction-related noise will mostly occur during daylight hours. Any impact to recreational users will be punctual and is expected to be minimal. Any impact to wildlife due to increased noise levels will also be temporary.

The proposed turbines will be located at more than 1.4 km from a residence or cottage. At this distance, noise levels during the operations phase are expected to be significantly below the limit prescribed by the MDDELCC (40 dBA at night). Overall, noise impacts of the project are expected to be not significant, given the remoteness of the site and the absence of permanent residences.

Construction and post-construction noise monitoring are typically conditions of approval for wind projects. Excessive noise levels will require mitigation, as necessary.

x. Aesthetic/visual impacts

Visual impact in mountainous regions varies depending on the viewer's location and distance from the turbines. In and around the project area, the combination of trees and the terrain generally limits visibility of the turbines. As distance increases, the relative size of the turbines compared with objects in the viewshed diminishes.

However, the visual impacts of wind energy projects are often raised as a concern by local communities. The Témiscouata, Kamouraska and Rivière-du-Loup MRCs have developed an Interim Control Bylaw (ICB) specific to the development of wind energy projects. These documents outline setbacks and limits for wind projects, specifically applicable to urban areas, roads, residences and lakes. The objective of these setbacks is primarily to reduce the visual impact of the Project on regionally sensitive features or areas.

A visual impact assessment will be conducted as part of the environmental approval process. Visual simulations will be prepared and presented to the public. Overall, visual impacts of the Project are expected to be not significant, given the remoteness of the site and the absence of permanent residences.

xi. Transmission infrastructure impacts

HQT will be responsible for the environmental assessment of the 315 kV transmission line that will connect the project's substation to the HQT grid. On a preliminary basis, it is expected that the line will have minimal impact on the environment, given its very limited length of 1.2 mile. As per HQT best practices, the siting and design of the transmission line will aim to minimize impacts on valued environmental components, as per the Quebec environmental assessment process under the EQA. Currently, the expected path of the transmission line is expected to have minimal impacts as it will not cross watercourses, wetlands or waterbodies and it is not located near any existing residences. Tree removal will however be required to provide a corridor for the line, on a 1.2 mile distance.

xii. Fuel supply access, where applicable

The project is a wind energy project and will not require fuel supply.

- 7.4 Provide documentation identifying the level of public support for the project including letters from public officials, newspaper articles, etc. Include information on specific localized support and/or opposition to the project of which the bidder is aware. Provide copies of any agreements with communities and other constituencies impacted by the project, and a plan for community outreach activities, and discuss the status of that plan.

GSPL Project

Public outreach and involvement is central to the development philosophy of the GSPL Project. GridAmerica and the GSPL Project team are committed to timely, accurate and consistent information sharing. Because of the project merits, our approach, and on-the-ground efforts in Vermont and New Hampshire, we have received positive feedback from the public and have

garnered support from a diverse and growing group of elected officials, organizations, and individuals. We are confident the list of supporters will continue to grow as the project advances through commercialization and permitting. Table 7.4.1 presents key GSPL Project Letters of Support received to date, and the associated letters and/or documentation are provided as *Attachments 7.4.1 – 7.4.13(b)*.

Table 7.4.1 GSPL Project Letters of Support

Vermont	New Hampshire	Massachusetts
State Senators from the Northeast Kingdom of Vermont representing the project route towns	19 State Representatives from various towns and cities throughout New Hampshire	<u>Residents:</u> <ul style="list-style-type: none"> • Mark Orzeck
State House Representatives from the Northeast Kingdom of Vermont representing the project route towns	State Senator Bob Giuda, representing several project route towns	
Town of Waterford, a project route town	State Senator Lou D'Allesandro, representing Goffstown, a project route town	
Vermont Association of Snow Travelers (VAST)	Grafton County Commissioner Linda Lauer, representing project route area	
Northeastern Vermont Development Association (NVDA), representing all communities within the Northeast Kingdom of Vermont, including all project route towns	Town of Goffstown, a project route town	
	Central New Hampshire Chamber of Commerce	
	Mike Ahern, Plymouth, NH Board of Selectman member and local businessman	
	<u>Residents:</u> <ul style="list-style-type: none"> • Richard Hage • Anne Hunnewell • Denise Castonguay • Kimberly Sychterz • Jennifer Legier • Carol Dunn • Phyllis Young • Maryellen Sakura • Jan Stevens • Irene Garvey 	
37 Signatories to an Online Support Petition at www.GraniteStatePowerLink.com		

The project also maintains strong support from organized labor through the local International Brotherhood of Electrical Workers (IBEW) Local 104 and IBEW Local 103, representing labor interests in New England. The GSPL Project and IBEW signed a memorandum of understanding (MOU), which commits the GSPL Project to use the highly skilled local workers in NH and New England first on the project construction. This effort will provide incredible benefits to families and businesses throughout the region. Letters of support from IBEW Local 104 and IBEW Local 103 are attached.

Elected officials, municipalities, non-profits, and residents alike are drawn to the GSPL Project because of the project's minimal impact and maximum benefits to communities along the route. Local decision-makers, thought leaders and the public alike recognize the value that the GSPL Project offers:

- Lower overall cost compared to similar projects;
- Adjacent to or within existing transmission corridors, limiting environmental and viewshed impacts;
- Reuse of existing infrastructure thereby limiting view and environmental impacts and development costs;
- Local economic stimulus through increased property tax revenues, support of economic and community development programs, low income residential energy assistance (Citizens Energy), job creation and reduced energy costs for consumers.
- Commitment to a long-term partnership with GridAmerica/National Grid.

These benefits were recognized in recent testimony delivered to the New Hampshire Site Evaluation Committee (SEC) hearing on July 20, 2017, where 107 current and former members of the New Hampshire House and Senate touted the preference of the GSPL Project over other project options. The full testimony is included as *Attachment 7.4.14*.

GridAmerica has undertaken extensive outreach efforts since the public launch of the GSPL Project in March 2017, in accordance with a comprehensive stakeholder outreach and communications plan that covers project development through operations (see *Attachment 7.4.15 – GSPL Public Outreach Plan*). In this short time frame, GridAmerica has targeted grassroots and grasstops stakeholders and held briefings; conducted one-on-one meetings; presented to Boards of Selectmen and Town/City Councils, state and federal legislators, NGOs and interest groups; hosted community public meetings; and, touched all project landowners and abutters with various outreach tactics in an effort to provide wide-reaching education on the project and the development, permitting, and construction process.

The project is committed to open, transparent and regular communication to ensure public participation is embedded into all activities, and the response has been very favorable. In addition to the support letters received, *Attachment 7.4.16 – GSPL Positive Public Quotes* highlights some of the public quotes on the project, which focus on the critical need and preference for the project from a diverse group of stakeholders in the region. *Attachment 7.4.17 – GSPL Social Media* features positive comments on social media regarding the GSPL Project. Common themes of feedback that have emerged from our outreach are noted in Table 7.4.2 below. Most of the critical comments received are typical of any transmission project in any area.

Table 7.4.2 GSPL Project Outreach Feedback Summary

Favorable Comments	Critical Comments
<ul style="list-style-type: none"> • This makes so much sense. • Using existing ROW and towers is better for NH. • The impacts are so much less for this project than Northern Pass. • This is the best project briefing; your information is clear and makes sense. • Using local labor is good for the region and smart for the project. • This project is a breath of fresh air; this is the first time we're getting honest information on a project. • How can we get citizens involved to support this? • Tax revenues could make a huge impact on the town. • I support the project; we need more power. • I wish this project was introduced sooner. • By getting the towns and public involved from the very start is the way to do these projects. 	<ul style="list-style-type: none"> • Why didn't you identify this solution before? • Will you be able to advance the project quick enough based on external deadlines? • Concerns on easement expansion on VT conservation land. • Wildlife impacts. • Impact to property and value. • EMF impacts. • Concern about power going to Massachusetts.

A dedicated public engagement team is committed to proactively engaging, informing, and responding to affected project communities and landowners/abutters, as well as interested organizations and individuals. This on-the-ground team will foster two-way communication with project stakeholders throughout the life of the project. These efforts are guided by the GSPL Project Public Outreach Plan (*Attachment 7.4.15*). The current phase of the plan is focused on project education, soliciting local feedback and building partnerships – much of which is featured in other outreach phases as well. Core areas of education and support-building have focused on:

- **Local and Regional Economic Development and Job Creation.** The GSPL Project will stimulate the local and regional economies throughout Vermont and New Hampshire through increased tax revenues, the creation of direct and indirect jobs during construction, access to new regional economic and community development programs via partnerships with economic development organizations, and assistance to low income families from Citizens Energy.
- **Energy Cost Savings.** The GSPL Project will deliver low cost, clean energy to the region, thereby stabilizing and diversifying the regional supply thereby lowering prices. This cost savings will be realized by all New England customers, which will positively impact economic development opportunities.

- **Environmental Stewardship.** The GSPL Project takes great care in protecting natural resources and environmentally sensitive areas. By utilizing existing transmission corridors and assets, the project will have minimal environmental and viewshed impacts. Additionally, the project will transport clean, renewable energy, which will reduce carbon emissions annually through the region.
- **Experience.** The GSPL Project team has deep experience developing and building transmission projects. This experience is leveraged in building and maintaining positive relationships with affected communities and landowners/abutters during the project process.

The outreach efforts, while closely coordinated, are split between GridAmerica and its affiliate, New England Power (NEP). To date, GridAmerica has led all initial project outreach to introduce stakeholders to the proposal and garner support. GridAmerica's outreach responsibilities for permitting, siting, construction and post construction will be focused on the overall project impacts, easement acquisition or adjustments, the HVDC line and converter stations and those impacted communities and landowners/abutters. The NEP will have a similar focus leading outreach on permitting, siting, construction and post-construction for the New Hampshire AC upgrade and switching station.

To date, the following outreach activities have been completed or are in progress since March 2017:

- **Project public educational campaign.** The stakeholder engagement plan is centered around a multi-media educational campaign to creatively and directly communicate with project stakeholder through all methods – in-person, virtually, mail, phone blasts, local and regional media, and social media. The outreach team has conducted over 190 meetings and briefings, as well as frequent correspondence with a variety of project stakeholders, including federal, state, local and municipal officials and governmental bodies, and non-governmental and non-profit organizations and groups. The team has presented to all Vermont Select boards and 99 percent of New Hampshire select boards/city or town councils. The team will continue to build out the campaign as the project advances. Table 7.4.3 below lists our current outreach statistics since launch.

Table 7.4.3 GSPL Project Outreach Statistics Since March 2017 Launch

Type of Outreach	Total
In-person Meetings and Briefings	190
Public attendance at municipal presentations	Approximately 200
Community Meetings (open houses)	11 (covering all VT project towns and 50 percent of NH project towns)
Community Meeting attendees	Approximately 240
Inquiries via hotline or email	51
Unique website visitors	1,757

- **Virtual project information toolbox.** The GSPL Project boasts a dedicated project website (www.GraniteStatePowerLink.com), Twitter (@GSPowerLink), email account

(info@GraniteStatePowerLink.com), and toll free hotline (1-855-603-GSPL) to make continuous communication easy and immediate. These tools will serve as a useful way to gather stakeholder input and provide ways to share project milestones. Any method to allow an informed, productive dialogue will be pursued by the outreach team.

- **Comprehensive Database.** Maintaining accurate records of public interaction is important to identify and address areas of weakness or problem. The team has established a web-based database to track project interactions, feedback and areas of follow up. This will aid in supporting not only GSPL Project construction efforts, but operations and maintenance into the future.
- **Public community meetings.** The GSPL Project has hosted community public meetings in all HVDC route towns in Vermont and New Hampshire with additional New Hampshire meetings planned throughout the summer. A second round of public community meetings will be scheduled prior to state siting filing. The team will also conduct regular community check-ins and host roundtable discussions in key areas.
- **Landowner/abutter outreach.** The team is focused on prioritizing landowner/abutter outreach to ensure that they are integrated into all project activities and providing feedback that will improve the project outcomes. Communication has begun through mailed letters and postcards, as well as door-to-door canvassing on the HVDC portion. This will continue throughout ease phase and milestone of the project.
- **Partnership Building.** Securing local and regional partners will help elevate the project's success and provide additional benefit for the communities and their businesses and residents. As mentioned above, GridAmerica has signed an MOU with the local International Brotherhood of Electrical Workers (IBEW) 104, pledging to use local labor first for construction. This will have dramatic impacts to local families, businesses and overall economy in NH and VT. GridAmerica continues to work with regional economic development organizations to identify opportunities that will improve existing business and community programs in some hard hit areas.
- **Advertising and Media Promotion.** The project team is proactively working with local and regional media outlets as a means of educating key stakeholders and the general public about project components, public meetings and next steps. To date we've received over 100 earned media mentions, reaching a total readership of over 500,000 through print and digital news stories, as well as blogs. Additionally, in advance of a series of project public community meetings, GridAmerica ran advertisements in local host community papers. Several positive project mentions have been made publicly by a number of thought leaders, elected officials and residents. *Attachment 7.4.18 – GSPL Media Coverage* includes a listing of media stories and wire pickups, and *7.4.19 – GSPL News Articles* provides a compilation of news articles showcasing the depth of coverage.

Stakeholder engagement is vital to advancing the GSPL Project in a cooperative and minimally impactful manner. Our team is focused on building trust by maintaining a regular two-way

dialogue with all stakeholders and will encourage all feedback to incorporate into a successful project for the region.

Mistissini Project

The Mistissini project has been in development for nearly 10 years, with extensive stakeholder consultation completed to date and a solid relationship established with the local First Nation community, the Mistissini Cree. A Band Council Resolution of Support is provided as *Attachment 7.4.20 (Confidential) – Band Council Resolution of Support*.

Consultation activities have included:

- Presentations to Chief and Council
- Site visits with community members and the local Talleyman
- A site visit to an existing windfarm project for interested members of the community
- Open house meetings and community presentations

RES Canada believes in a holistic approach to engagement and consultation activities, and will expend required time and resources to ensure that the local community, specifically the Mistissini Cree community, but also non-Aboriginal stakeholders are informed and supportive of the project.

Planned engagement activities and tools will include:

- Additional presentations to Chief and council
- Additional public open-house meetings
- A project website, information email address, and hotline
- A quarterly newsletter with information on project development

The Quebec Environmental Assessment Process is aligned with the consultation process and so additional engagement will include distribution of additional environmental and project design information. Any stakeholder concerns will be addressed and project stakeholder and permitting risks will be mitigated.

It should be noted that consultation to date with various stakeholders, as well as the partnership established with the Mistissini Cree, suggest that the Project has already gained a high level of social acceptability, and RES Canada has not witnessed any opposition to this Project. Nevertheless, consultation and engagement will continue throughout the development of this Project to ensure that any concerns are taken into account in the Project's planning. Consultation for this Project will follow RES Canada's consultation and engagement plan, provided as *Attachment 7.4.21 – RES Canada Stakeholder Engagement Plan*.

Vauban Project

The Vauban Project is located in the Bas-Saint-Laurent region, known to be very favorable to wind development. Wind projects on this territory have been evolving over the past 10 years and the surrounding communities and various stakeholders have been engaged since then. RES Canada took over the development of the Vauban Project in the past years and is currently in discussions

with the Alliance de l'Est, communicating with the municipalities and establishing a community outreach plan.

In anticipation of the last wind energy tender in Quebec (in 2014), the municipal entities of two administrative regions –Bas-Saint Laurent and Gaspésie – joined together to create the Alliance de l'Est, in order to participate in wind development along with private partners. This grouping effort has been successful and the Alliance de l'Est is currently a partner in two wind projects in the region (Ronceveau is in operations and Nicolas-Riou is in construction). The collaboration of the Alliance has become key in the development of wind projects in eastern Quebec and, as such, the Vauban Project benefits from their support and knowledge.

RES Canada and the Alliance de l'Est agreed to pursue discussions in order to enter into a partnership, with the objective to maintain favorable community engagement throughout the development, construction and operations of the project. In that sense, a support letter from the Alliance de l'Est is provided in *Attachment 7.4.22 (Confidential) – Alliance de l'Est support letter*.

RES Canada values strong relationships with communities in which its projects are established and has had great success in maintaining these relations through time.

Planned engagement activities and tools will include:

- Additional presentations to the Alliance de l'Est
- Presentations to local municipalities and stakeholders
- Public open-house meetings
- A project website, information email address, and hotline
- A quarterly newsletter with information on project development

The Quebec Environmental Assessment Process is aligned with the consultation process and so additional engagement will include distribution of additional environmental and project design information. Any stakeholder concerns will be addressed and project stakeholder and permitting risks will be mitigated.

It should be noted that consultation to date with various stakeholders, as well as the Alliance de l'Est interest in partnering with RES Canada, suggest that the Project has already gained a high level of social acceptability, and RES Canada has not witnessed any opposition to this Project. Nevertheless, consultation and engagement will continue throughout the development of this Project to ensure that any concerns are taken into account in the Project's planning. Consultation for this Project will follow RES Canada's consultation and engagement plan, provided as *Attachment 7.4.20 – RES Canada Engagement Plan*.

7.5 For bids that include New Class I Renewable Portfolio Standard Eligible Resources, provide documentation demonstrating that the project was or will be qualified as such. If the facility is already in operation, please indicate when the facility received such qualification.

Under the Massachusetts RPS New Class I Renewable Portfolio Standard Eligible Resources are defined as follows:

RPS Class I Qualified Generation Units were built on or after January 1, 1998 and have met the requirements of the RPS Class I regulations. These Units can be located anywhere in the ISO New England control area, as well as in the adjacent control areas (northern Maine, New York, Quebec, or the Canadian Maritime Provinces), provided that they transmit their power into New England and meet other import criteria. Their NEPOOL GIS Certificates are known as RPS Class I Renewable Energy Certificates or Mass. Class I RECs.

Both proposed RES Canada Clean Energy Generation Projects are wind energy projects located in Quebec, which is considered an adjacent control area. As such the projects would qualify as New Class I Renewable Portfolio Standard Eligible Resources.

Further, the DOER's document entitled "225 CMR 14.00: RENEWABLE ENERGY PORTFOLIO STANDARD - CLASS I" provides clarifications as to eligible resources that would be provided from an adjacent control area, such as Quebec, under section 14.05 (5) Special Provisions for a Generation Unit Located in a Control Area Adjacent to the ISO-NE Control Area.

RES Canada considers that these provisions can be fully met and that the proposed Clean Energy Generation from the Mistissini and Vauban projects located in Quebec qualify as RPS Class I Qualified Generation Units.

- 7.6 All bidders must include sufficient information and documentation that demonstrates that the bidder will utilize an appropriate tracking system to ensure a unit-specific accounting of the delivery of Clean Energy Generation, to enable the Department of Environmental Protection, in consultation with DOER, to accurately measure progress in achieving the commonwealth's goals under chapter 298 of the acts of 2008 or Chapter 21N of the General Laws. The RECs and environmental attributes associated with Clean Energy Generation must be delivered into the Distribution Companies' NEPOOL GIS accounts.

The two proposed projects will deliver electricity on the HQT transmission network at the transforming substation, referred as Point of Interconnection (POI) in Section 6. HQT will provide all required metering systems. These systems will be conformed and installed as required in the norm F.22-01 (4th edition) – Electricity Metering in Medium and High Voltage. The norm is provided in French as *Attachment 7.6 - HQT Technical Metering Standards (norme-f22-01-edition-4)*. Monthly invoiced will be issued to ensure a unit-specific accounting of the delivery of Clean Energy Generation. As per the Quebec OATT, the system losses for the HQT portion of the line at were established at 6.0% and the GSPL Project system losses were evaluated to be 2.05%. Combined with the metering systems installed at the POI and the monthly invoiced, the global system will ensure specific accounting of the delivery of Clean Energy Generation, to enable the Department of Environmental Protection, in consultation with DOER, to accurately measure progress in achieving the Commonwealth's goals under Chapter 298 of the Acts of 2008 or Chapter 21N of the General Laws.

- 7.7 Identify any existing, preliminary or pending claims or litigation, or matters before any federal agency or any state legislature or regulatory agency that might affect the feasibility of the project or the ability to obtain or retain the required permits for the project.

GSPL Project

There are no existing, preliminary or pending claims or litigation, or matters before any federal agency or any state legislature or regulatory agency that might affect the feasibility of the GSPL Project or the ability to obtain or retain the required permits.

Mistissini Project

RES Canada is not aware of any existing, preliminary or pending claims or litigation, or matters before any federal or provincial agency that might affect the feasibility of the Mistissini Project or the ability to obtain or retain the required permits.

Vauban Project

RES Canada is not aware of any existing, preliminary or pending claims or litigation, or matters before any federal or provincial agency that might affect the feasibility of the Vauban Project or the ability to obtain or retain the required permits.

SECTION 8 OF APPENDIX B TO THE RFP ENGINEERING AND TECHNOLOGY; COMMERCIAL ACCESS TO EQUIPMENT

This section includes questions pertinent to the engineering design and project technology. This section must be completed for a project that includes new facilities or capital investments for both generation and transmission components if applicable. Bidders should provide information about the specific technology or equipment including the track record of the technology and equipment and other information as necessary to demonstrate that the technology is viable.

- 8.1 Provide a reasonable but preliminary engineering plan which includes the following information:
- i. Type of generation and transmission technology, if applicable
 - ii. Major equipment to be used
 - iii. Manufacturer of the equipment
 - iv. Status of acquisition of the equipment
 - v. Whether the bidder has a contract for the equipment. If not, describe the bidder's plan for securing equipment and the status of any pertinent commercial arrangements
 - vi. Equipment vendors selected/considered
 - vii. History of equipment operations
 - viii. If the equipment manufacturer has not yet been selected, identify in the equipment procurement strategy the factors under consideration for selecting the preferred equipment
- 8.1.i. Type of generation and transmission technology, if applicable*

GSPL Project

Key Transmission Technology: GridAmerica has selected High Voltage Direct Current (HVDC) technology using Voltage Source Converters (VSC) in conjunction with an overhead HVDC transmission line as the optimal solution to transmission connection between Quebec and New England. In collaboration with GridAmerica's technology bid partner, General Electric (GE), the GSPL Project team has developed a technical proposal that is based upon GE's MaxSine™ technology, which is a flexible modular multi-level converter that permits the creation of an AC side voltage waveform. The maximum DC voltage of the scheme is 400kV to ground and the rated nominal current is 1500Adc. This ensures that under all operating conditions up to 1200MW, in symmetrical monopole, configuration can be delivered by the converters of the DC terminals of the inverter.

As part of the process to choose this technology, GE undertook a series of preliminary engineering activities to define the requirements of the scheme to integrate with the existing AC systems and to meet the requirements of the GSPL Project. The key engineering activities included:

- Steady state load flow (Main Circuit) and principal equipment rating
- Insulation Coordination
- Converter Transformer Design
- HVDC Valve Design
- AC and DC Control and Architecture
- Civil Design and Station Layout
- Reliability & Availability (Scheme Performance)
- System Losses

The GE HVDC solution uses a state-of-the-art control design that can be made to alter its behavior during both steady-state and temporary conditions. This facility is used to carry out compensatory changes quickly, anticipating the response of a power system to specific events, thereby minimizing their consequences.

The platform on which the converter control system operates is GE's industry-leading HVDC digital control and protection system, offering fully-redundant operation, including monitoring and alarm capabilities.

The voltage source converters will use a modular multi-level converter design arranged in a symmetric monopole configuration. The planned HVDC design can achieve lower electrical losses, reduced audible sound levels and higher power quality performance, all within a smaller footprint compared to conventional HVDC technology.

The following components of the GSPL Project are necessary for the project. They will utilize well-established existing technologies, which are summarized below:

- AC switching station, Norton, Vermont (located north to the North converter station)
- AC "tail" connecting the Norton converter station to the HQT system at the U.S./Canada border
- AC "tail" connecting the Monroe converter station to New England Power's Comerford Substation
- Relocations of two existing New England Power 230kV AC transmission lines along five miles of existing New England Power right-of-way

For the $\pm 400\text{kV}$ HVDC overhead line, tubular steel pole structures and aluminum conductors will be used to provide strength and durability for long-term reliability. To minimize the visual impact, the structures will be manufactured to appear nearly identical to the existing HVDC line structures, and they will be placed adjacent to existing HVDC structures whenever possible. The structures will be made from weathering steel, which will age to a dark brown color, further reducing the visual impact. The line will have two direct-current poles, each comprised of three 2156 kcmil ACSR "Bluebird" conductors. One of the two shield wires will be a 5/8" 19-strand extra-high-strength steel wire, and the second will be fiber optic ground wire (OPGW). The majority of foundations will utilize micropiles, which are well suited to locations with shallow bedrock and reduce the need to expand the existing gravel road network along the length of the right-of-way to accommodate the passage of concrete trucks. The remaining foundations will be reinforced concrete raft foundations and reinforced concrete caissons.

To reduce environmental impacts, lower construction costs and increase the efficiency of future maintenance, the new HVDC transmission line will be placed adjacent to an existing $\pm 450\text{kV}$

HVDC transmission line for its entire length, but spaced sufficiently to minimize the risk of mutual interaction or mutual failures and maintain a quality and security of power supply to Massachusetts.

This existing HVDC line, “Phase 1”, was commissioned in the 1980s. The right-of-way in which it is located extends from the U.S. and Canada border in Norton, Vermont to Monroe, New Hampshire. The “Phase 2” +/- 450kV HVDC line, which was placed in service in 1990, extends from Monroe, New Hampshire to Ayer, Massachusetts. The two converter stations and AC switching station in Norton, Vermont will both be located very close to the existing right-of-way.

The existing HVDC right-of-way in Vermont is predominantly owned by Vermont Electric Transmission Company (VETCO), a subsidiary of Vermont Electric Power Company (VELCO). For the first 47 miles of the right-of-way, the existing HVDC line is located at the center of the 200 foot wide right-of-way as it crosses through the towns of Norton, Avery’s Gore, Averill, Lewis, Bloomfield, Brunswick, Ferdinand, Granby, Victory, Lunenburg, and Concord, Vermont. Because of VELCO’s familiarity with the route and their existing asset, VELCO has strong interest in its potential to perform the engineering and construction of the GSPL Project. Such a contract would entail benefits to Vermont ratepayers and bring VELCO’s engineering and construction experience in Vermont to the GSPL Project execution. VELCO and the GSPL Project continue their discussion to more fully develop and define the potential benefits and arrangement.

From about mile 47 to mile 52, the Phase 1 HVDC line occupies a 335-foot wide right-of-way parallel to a 115kV line owned by Eversource and a 34.5kV owned by New England Power as it crosses from Concord to Waterford, Vermont.

From mile 52 in Waterford, Vermont to mile 53 in Littleton, New Hampshire, the Phase 1 right-of-way is 200 feet wide as it crosses the Connecticut River into New Hampshire where it intersects another New England Power right-of-way. From mile 53 in Littleton, New Hampshire to mile 58 in Monroe, New Hampshire the HVDC line parallels two NEP 230-kV lines within a 375-foot wide right-of-way. *Attachment 8.1.1 – GSPL DC Line Cross-Section Diagrams* provides detailed cross sections covering the entire 58-mile GSPL Project route.

RES Canada Wind Portfolio

For the purpose of this proposal, RES Canada understands that “major equipment” associated with the generation projects are limited to the wind turbine generator technology and the main MV-HV transformer.

With respect to the generation technology, RES Canada proposes to use wind turbine generators of latest generation to produce the energy to be delivered into the ISO-NE market settlement system. The proposed wind turbine generator placeholder technology is the Vestas V136 3.6MW at 105m hub height. Detailed information on the technology can be found in *Attachment 8.1.3 (confidential) – 0053-3707_V03 - General Description 3MW Platform*. RES Canada has evaluated multiple Tier 1 wind turbine technologies and final selection would be made according to schedule presented in Section 8.1 iv.

The main transformer for a wind facility is also often considered a long-lead procurement item. RES Canada will commence detailed engineering early enough in the development phase in order to be able to specify and order the transformer ahead of schedule. RES Canada procures transformers

and turbines on a regular basis and is well connected to all the major suppliers in Canada and throughout North America.

8.1.ii. Major equipment to be used

GSPL Project

GridAmerica in collaboration with GE has been engaged in preliminary engineering, and this work will continue during the remaining bid process. The project team's current technical proposal calls for the following major equipment:

- HVDC Converter Transformers with on-load tap changer
- Converter Valves (Comprising hundreds of valve sub-modules, containing the power electronic equipment – insulated-gate bipolar transistors (IGBT) – needed to rectify/invert the electrical current)
- Valve Reactors
- Smoothing Reactors
- Cooling System
- Control and Protection Systems
- HVAC Switchgears
- Auxiliaries (aux. transformers along with UPS & battery systems)

Specific equipment will be selected through a series of extensive engineering activities and studies that consider the intended use of the equipment, maintenance needs, and requirements of the project.

Major materials for the HVDC line are described in 8.1.i.

RES Canada Wind Portfolio

The placeholder wind turbine generator is the Vestas V136 3.6MW at 105m hub height.

A summary of the technology is provided in Table 8.1 below and detailed performance specification and general characteristics of the Vestas V136 3.6MW wind turbine technology can be found in *Attachment 8.1.2 (confidential) – 0056-6306_V00 - Performance Specification V136-3.60MW HH105 and HH132*, *Attachment 8.1.3 (confidential) – 0053-3707_V03 - General Description 3MW Platform* and *Attachment 8.1.4 (confidential) – General Description for V136-3.6MW_Confirmation*.

Table 8.1.1 – Generation Technology

Vestas V136 3.6MW at 105m HH	
Specification	Details
cut-in wind speed	3 m/s
cut-out wind speed	22.5 m/s
nominal power wind speed	12 m/s
number of blades	3
rotor diameter	136 m
rotor swept area	14527 m ²
rotor swept height	37 m to 173 m
rotor speed (variable)	5.6 to 15.3 revolutions per minute
tower (hub) height	105 m
gearbox	Multi-stage planetary + helical
generator	Asynchronous with cage rotor + full scale converter
braking system	Aerodynamic full feathering + mechanical disc brake
yaw system	Multiple geared drive motors
tower design	Tubular steel

Both the cold climate option as well as the blade de-icing package have been selected to optimize the performance of the wind turbine (*Attachment 8.1.5 (confidential) - General Specification VDS V136-3.45MW* and *Attachment 8.1.6 (confidential) – Delcing_V136_3-6_Confirmation_20170411*).

8.1.iii. Manufacturer of the equipment

GSPL Project

Equipment will be procured and manufactured by well-established and specialized internal and external partners of GE, the only U.S. company with a long-standing history of providing HVDC equipment suitable for the required application. Vendors are selected based on their experience in design and supply of similar voltage class equipment required by the project, their quality process, competitiveness and operation and maintenance requirement of the scheme.

Manufacturers of materials for the HVDC line are described in Section 8.2 below.

RES Canada Wind Portfolio

The V136 3.6MW wind turbine technology is manufactured by Vestas. The complete supply chain will be defined a later stage, during the Turbine Supply Agreement discussions as set forward in Table 8.1.2 below (see 8.1.iv *Status of acquisition of the equipment*).

The technology is an evolution the Vestas 3MW platform, which was introduced in 2010. In terms of site suitability, it is considered as the optimal technology for the wind regime and climatic conditions experienced at the site. A statement on the suitability of the turbine technology for the site can be found in *Attachment 8.1.7 (confidential) – Letter - RES Canada - March 31 2017*.

*8.1.iv. Status of acquisition of the equipment***GSPL Project**

Currently, GridAmerica has not contracted nor purchased any equipment or materials. As the project evolves, GridAmerica will work with GE to develop detailed technical and performance specifications along with the required supply agreements for design and manufacture of the HVDC converter equipment.

As the design of the ± 400 kV HVDC overhead line progresses, bid packages will be offered to the competitive market to source the materials from approved vendors with a strong internal and project mandated quality control and quality assurance programs. All procurement efforts will be deployed to support the GSPL Project in a cost efficient and schedule conscious manner.

RES Canada Wind Portfolio

RES Canada has requested pricing proposals from various Tier 1 turbine vendors.

If RES Canada were selected in the current procurement process, the following schedule would be followed:

Table 8.1.2 Procurement Schedule

2022 COD	
Key Commercial Milestone	Key dates
Conclude Turbine Supply Agreement	Q2 2021
Turbine Delivery	Q2 2022
Commissioning	October 2022
Commercial Operation Date (COD)	December 1, 2022

*8.1.v. Whether the bidder has a contract for the equipment. If not, describe the bidder's plan for securing equipment and the status of any pertinent commercial arrangements***GSPL Project**

As mentioned above, GridAmerica has worked with GE throughout the development phase, and GE is the preferred vendor for the converter stations.

The plan for and status of the acquisition of materials for the HVDC line is described in Section 8.1.4.

RES Canada Wind Portfolio

Given the expected COD, it would be premature to commence negotiations for the supply of major project equipment. The procurement plan is detailed in the section above (see Status of acquisition of the equipment).

8.1.vi. Equipment vendors selected/considered

GSPL Project

GridAmerica will continue to work closely with GE to develop detailed technical and performance specifications along with the required supply agreements for design and manufacture of the HVDC converter equipment. Although GridAmerica intends to continue to work with GE as its manufacturer, other major HVDC converter station manufacturers have communicated their interest in providing EPC services for the GSPL Project's converter stations. GridAmerica will consider other manufacturers to the extent that they can meet the technological, reliability, and schedule requirements of the project. However, GE remains the preferred supplier.

To provide the best-in-class solution and meet GridAmerica's expectations, in conjunction with GE, GridAmerica will leverage the experience, expertise, and knowledge from across the world-class global GE businesses:

- GE Solutions Business Units in Chicago and Saratoga Springs, USA
- GE Power Electronics and Integration Center Units in Paris & Saint Priest, France
- GE HVDC Center of Excellence Unit in Stafford, UK

A dedicated project management team drawn from the vast pool of experienced project management personnel will be established during the next stage of development. The project management team will be highly qualified and experienced HVDC project directors with extensive experience in delivering large and complex HVDC projects around the world. The delivery of the scope will be supported by a dedicated team of engineers and domain experts for the timely execution of the project.

Upon commencement of site work, GE would assign a dedicated resident site manager and team to work with the GSPL Project management team to ensure work is conducted in accordance with the project requirements and schedule. Recognizing complexity of the project and expectations of GridAmerica, GE has clearly identified adequate resources to ensure successful and timely delivery of the Converter Stations.

The plan for and status of the acquisition of materials for the HVDC line is described in Section 8.1.iv.

RES Canada Wind Portfolio

RES Canada has a long standing track record of dealing with major Tier 1 wind turbine generator vendors. During the pricing exercise several Tier 1 vendors have been considered. At this stage all major vendors are being considered including but not limited to Siemens, General Electric, Senvion, Vestas and Enercon.

If alternative turbine technology were deemed to be more suitable for the projects by RES Canada, it would be evaluated and adopted in compliance with the provisions of the electricity supply contract.

8.1.vii. History of equipment operations

GSPL project

GridAmerica's parent company, National Grid, with its partners, developed, constructed and commissioned the world's first multi-terminal high-voltage DC network. The 2000 MW interconnection between Canada and the U.S. imports approximately 10% of ISO-NE capacity daily. National Grid now operates the New Hampshire and Massachusetts portion of the network on behalf of an ownership group comprised of the participating utility companies. A highly-skilled full-time staff of 22 employees operates the Sandy Pond DC-AC converter terminal in Ayer, Massachusetts and has maintained a record of more than 99% availability against forced outages.

HVDC voltage source converter technology utilizing IGBT was developed in the late 1990s with the first commercial projects starting operation in 1999 and 2000. These initial projects were rated for $\pm 80\text{kV}$ and 60 MW, using pulse width modulated technology. Ratings increased dramatically for pulse width modulated type converters to $\pm 150\text{kV}$ and 350 MW by 2006. Technology advances in power electronics and control systems drove the design of the multi-level type converters, which have lower losses, higher reactive power ranges, lower audible sound and lower harmonic distortion. The first HVDC VSC using the modular multi-level (MMC) design started commercial operation in 2010. Currently, there are eight VSC MMC HVDC projects in operation, with several additional projects planned to be commissioned in 2017.

RES Canada Wind Portfolio

Vestas has a long track record of manufacturing, installing, and operating the 3MW platform around the world. To date there are 4,201 installed turbines with a total capacity of 13,191 MW in operation. The V136 is a model that belongs to this proven and reliable platform and a prototype is already in operation.

8.1.viii. If the equipment manufacturer has not yet been selected, identify in the equipment procurement strategy the factors under consideration for selecting the preferred equipment

GSPL Project

GridAmerica will take a strategic approach in developing a sourcing plan to secure engineering OEM equipment and construction resources. This strategic approach will include competitive sourcing of an EPC partner-contractor for the project implementation. The selected EPC firm will provide a dedicated, full-time project team consisting of engineering, procurement, and construction management resources who will take the project from conceptual design, through all phases of final engineering, major equipment procurement, and construction to deliver a turnkey, fully commissioned and operational HVDC transmission corridor. The EPC will work to the agreed conceptual design and best-in-class industry standards to design, source, and deliver the most competitive and efficient end product using GridAmerica approved sources of supply, including nationally and internationally proven converter equipment and HVDC transmission line OEMs. Those sources of supply will also be selected on a competitive basis, including full evaluation of advanced product design, functionality, reliability, warranty, availability (including spares), service considerations, compatibility with all other interconnected equipment, and cost.

As the design of the ± 400 kV HVDC overhead line progresses, bid packages will be offered to the competitive market to source the materials from approved vendors with a strong internal and project mandated quality control and quality assurance programs. All procurement efforts will be deployed in a cost efficient and schedule conscious manner.

RES Canada Wind Portfolio

Multiple factors beyond price are considered in the evaluation of a wind turbine generator including suitability for the site climatic conditions, track record of the equipment, noise profiles, applicable warranty provisions, and ability to secure turbine certification ahead of financing. Cold climate operational experience as well turbine de-icing technology will also be considered in the technology selection as part of performance rating.

8.2 If the bidder has not yet selected the major equipment for a project, please provide a list of the key equipment suppliers under consideration.

GSPL Project

Converter Stations:

The qualified equipment suppliers being considered for the converter station equipment are shown in Table 8.2.

Table 8.2 Potential GSPL Project Converter Station Equipment Suppliers

SI No.	Item Description	Proposed Supplier	
		Name	Nationality
1	Converter Valves	GE	UK
2	HVAC Switchgears	GE	EU/US
3	Converter Transformers	GE	UK/Germany
4	HVDC Control & Protection	GE	UK (Hardware: EU)
5	Other Control & Protection	GE	US/EU
6	Valve Reactors	GE/Trench/ Coil Innovation	Brazil/EU
7	Smoothing Reactors	GE/Trench/ Coil Innovation	Brazil/EU/Canada
8	Cooling System	SwedeWater FST Gaoland Neundörfer	EU EU China EU
9	Transient Fault Recorder	GE/Ametech/Electrotel	EU/US
10	Wall Bushings	GE	EU

HVDC Transmission Line:

The following vendors are qualified to provide major transmission line materials to GridAmerica.

- Steel Pole Vendors
 - Dis-Tran Steel LLC
 - Engineered Endeavors
 - MD Henry Co, Inc.

- Meyer Steel Structures
- Sabre-Fort Worth
- TransAmerica Power Products Inc.
- Valmont Industries
- Zhejiang Shengda Steel Tower Co (ZSST)
- Conductor and Shield Wire
 - AFL
 - American Wire Group
 - Brugg
 - Southwire
 - General Cable
 - Wuxi Jiang Nan Cable Company
 - Qingdao Hanhe Cable Company
 - Jiangsu Zhongtian Technology Company
- Insulators
 - Lapp Insulator
 - Newell Insulator
 - Sediver (SEVES)
 - SGD

RES Canada Wind Portfolio

Please refer to the Equipment Vendor Selected/Considered Section 8.1.vi, above, for the list of suppliers under consideration.

- 8.3 Please identify the same or similar equipment by the same manufacturer that are presently in commercial operation including the number installed, installed capacity and estimated generation for the past three years.

GSPL Project

GridAmerica's bid technology partner, GE, has been providing HVDC solutions for more than 50 years and has supplied back-to-back and point-to-point projects in many countries all over the world, particularly for systems with very challenging operating conditions.

Over the last three years GE has won and is currently delivering more than six HVDC projects including 2 x 600MW, ± 320 kV HVDC between France and Italy, and 900 MW ± 320 kV in Germany where it is enabling power generated by offshore windfarms to be transmitted onshore. In addition, GE is delivering Champa - Kurukshetra, 6000 MW, ± 800 kV in India and Rio-Madeira, 3150 MW, ± 600 kV HVDC transmission Scheme in Brazil, which, at 2375 km, is the world's longest HVDC transmission project.

In the U.S., GE is the preferred technology supplier for the HVDC Plains & Eastern Clean Line Energy Project, which will deliver 4,000 MW of low-cost wind power generated in Oklahoma to Tennessee and Arkansas.

The HVDC transmission line material manufacturers have their products installed on transmission lines throughout the U.S. and the world.

RES Canada Wind Portfolio

Vestas has a long-standing history of installing its 3MW platform wind turbine generators. A summary of the total capacity installed over the past three years is presented below:

- V112: 3,043 WTGs installed / 9,446 MW
- V117: 580 WTGs installed / 1,827 MW
- V126: 578 WTG installed / 1,918 MW

The total energy generated from the Vestas 3MW platform since January 2014 is estimated to be 64,228.77 GWh.

- 8.4 For less mature technologies, provide evidence (including identifying specific applications) that the technology to be employed for energy production is ready for transfer to the design and construction phases. Also, address how the status of the technology is being considered in the financial plan for the project.

GSPL Project

The HVDC voltage source converter transmission technology to be used by the GSPL Project is well established. It was developed in the 1990's and has progressed from +/-80kV at 60 MW to +/-525kV at 1400 MW today. The key technology applications used from 1999 until now are the insulated gate bipolar transistors (IGBT) and the control technology. Early project applications were Gotland (Sweden, 1999, +/-80kV, 50 MW) and Directlink (Australia, 2000, +/-80kV, 3x60 MW) to the latest operating projects Mackinac (USA, 2014, +/-71kV, 200 MW) and INELFE (Spain-Franc, +/-320kV, 2x1000 MW). The application of the IGBT and control systems for HVDC voltage source converter technology has evolved over time as IGBT and control system technology has advanced, and is considered a mature application.

RES Canada Wind Portfolio

Vestas has provided a statement on the suitability and maturity of the Vestas V136 3.6 MW. A copy of this statement is provided as *Attachment 8.1.7 (confidential) – Letter - RES Canada - March 31 2017*. As a series evolution to a proven and existing wind turbine generator platform, it should be considered favorably during financing.

- 8.5 Please indicate if the bidder has a full and complete list of equipment needed for all physical aspects of the bid, including generation facilities, transmission lead lines, transmission proposals, and mandatory and voluntary transmission system upgrades. If not, identify the areas of uncertainty and when the full and complete list of equipment will be identified.

GSPL Project

Converter: Preliminary engineering activities have been completed and GE has identified all the equipment and associated spares needed to deliver the Monroe and Norton HVDC converter stations and the Norton AC substation. Refer to 8.1.ii for the equipment list.

HVDC Transmission Line: GridAmerica has a list of equipment needed for the proposed 400kV DC transmission line and associated 230kV circuit relocations. The list of major equipment is provided below:

New 400kV HVDC Line

- 352 miles of 2156 kcmil ACSR “Bluebird” conductor
- 59 miles of 5/8” EHS steel shield wire
- 59 miles of fiber optic ground wire (OPGW)
- 366 tubular weathering steel structures
- 325 T Style Suspension Structures
- 25 Light Angle Dead-End Structures
- Ten Medium Angle Dead-End Structures
- Six Heavy Angle Dead-End Structures

Relocations of Existing 230kV Lines

- 32 miles of 795 kcmil ACSR “Drake” conductor
- 21 miles of 3/8” EHS steel shield wire
- 136 tubular weathering steel structures
- 124 weathering steel delta davit arm suspension structures
- Five weathering steel delta davit arm dead-end structures
- Four weathering steel H-Frame dead-end structures
- Three weathering steel single pole dead-end structures

Please note that this list is subject to further refinement as engineering progresses on the overhead lines.

RES Canada Wind Portfolio

RES Canada can provide a full list of equipment for all the physical aspects of the proposal with respect to the generating facilities. This standard list includes, but is not limited to, wind turbine generators, collector system equipment, transforming substation equipment, and O&M facility equipment.

Component equipment for a wind energy generation facility also includes:

- MV-HV transformer
- Padmount transformers
- MV junction boxes
- Switchgear
- Capacitor banks
- Telecommunications equipment
- Grounding equipment
- Performance meteorological towers

- Obstruction lighting
- Communications cabling
- Grounding cables
- Cable terminations

The extensive list of equipment can be made available to the evaluator upon request.

8.6 Please indicate if the bidder has secured its equipment for all physical aspects of the bid, including generation facilities, transmission lead lines, transmission proposals, and mandatory and voluntary transmission system upgrades. If not, identify the long-lead equipment and describe the timing for securing this equipment.

GSPL Project

Converter Station: GE has identified all the required equipment including long lead items for the Monroe and Norton HVDC converters (see Section 8.2) and the Norton AC substation. The project schedule in Section 10 was developed with consideration of the manufacturing and delivery times associated with each piece of equipment to ensure the converter facility is completed on time.

HVDC Transmission Line: The long lead items associated with the transmission line portion of the project include the steel pole structures, conductor and shield wire. The timing of releasing bids for these items will be contingent upon permitting approval. The project schedule in Section 10 was developed with consideration of the manufacturing and delivery times associated with these materials.

RES Canada Wind Portfolio

Given the expected COD, it would be premature to commence negotiations to procure any equipment associated with the physical aspects of the project. Procurement of the major long-lead equipment items – i.e. the wind turbine generators – will be procured according to the summary schedule provided above, in section “Status of acquisition of the equipment”.

SECTION 9 OF APPENDIX B TO THE RFP OPERATION AND MAINTENANCE

Projects that can demonstrate that the operation and maintenance (“O&M”) plan, level of funding, and mechanism for funding will ensure reliable operations during the term of the contract or the tariff are preferred.

- 9.1 Provide an O&M plan for the project that demonstrates the long term operational viability of the proposed project. The plan should include a discussion of the staffing levels proposed for the project, the expected role of the project sponsor or outside contractor, scheduling of major maintenance activity, and the plan for testing equipment.

GSPL Project

Overview of Transmission Operations and Maintenance

GridAmerica’s parent company, National Grid, with its partners, developed, constructed and commissioned the world’s first multi-terminal high-voltage DC network. The 2000 MW interconnection between Canada and the U.S. imports approximately 10% of ISO-NE capacity daily. National Grid now operates the New Hampshire and Massachusetts portion of the network on behalf of an ownership group comprising the participating utility companies. A highly-skilled full-time staff of 22 employees operates the Sandy Pond HVDC converter terminal in Ayer, Massachusetts and has maintained a record of more than 99% availability against forced outages. Inspection, maintenance and emergency response are provided for the HVDC line by National Grid in the same manner as for its AC lines. Specific O&M plans for the AC-DC converter stations, the Norton AC station and the HVDC transmission line are described below.

Converters: The proposed preventive maintenance plan for the GSPL Project HVDC converter stations is detailed in *Attachment 9.1.0 (confidential) – GE VSC Converter Maintenance*.

In general, the maintenance of the converter stations is carried out on annual basis for typically 3.5 days, but in some cases a maximum of seven days. The maintenance activity is executed during consecutive days with a shift time per day of eight hours plus a maximum of four hours of overtime. Some of the equipment, such as the cooling system, has built-in redundancy and can be maintained without the need to reduce the power. However, for maintaining other equipment such as converter valves, it will be necessary to de-energize the converter stations.

Maintenance activities will be conducted by 10 to 15 trained personnel working in teams of two to five people. The equipment covered includes converter valves, control, protection and telecom, cooling system, auxiliaries, switchgears, transformers, and reactors.

Based on the specific maintenance requirements of the converter, GE will develop a detailed preventive maintenance schedule in advance to meet operational needs and requirements.

HVDC Transmission Line:

Preventive and Predictive Maintenance GridAmerica will contract with affiliates of its parent, National Grid, for operations and maintenance. National Grid USA (NGUSA) has extensive preventive and predictive maintenance and testing programs. The new line will be seamlessly incorporated into these programs, which are documented in Electric Operating Procedure (EOP)-T007.00, *Inspection and Maintenance Activities (Attachment 9.1.1 - Inspection and Maintenance*

Activities) and detailed in program-specific procedures that are summarized below, with detailed guidance documents provided as attachments.

- ***Aerial Visual Inspection (Semi-Annually)*** During the aerial visual inspection, the transmission line is checked for damaged components, such as broken insulators or broken conductor strands that could pose an immediate operational concern. Defects are reported and repaired in accordance with established timeframes. Unauthorized use of the transmission line right-of-way, vegetation, abnormal structure condition, avian concerns and all other notable anomalies are noted for further action if necessary (see *Attachment 9.1.2 - Aerial Visual Inspection*).
- ***Electrical Connector Inspection (Annually)*** During the electrical connector inspection, a helicopter-mounted infrared (IR) camera determines the temperature of all system components and connectors along the transmission line conductors. Sharply elevated temperatures (“hotspots”) indicate a rise in electric resistance, an indicator of potential future failure. Hotspots are reported and scheduled for repair in accordance with established timeframes (see *Attachment 9.1.3 – Electrical Connector Inspection*).
- ***Ground-level Visual Inspection (Every 5 years)*** During the ground-level visual inspection a foot or vehicle assessment of all components are checked for damage and decay, such as cracked insulators or damaged structural members. Defects are noted and repaired in accordance with established timeframes (see *Attachment 9.1.4 - Ground-level Visual Inspection*).
- ***Steel Structure Foundation Inspection (Every 20 years)*** During the steel structure foundation inspection, concrete piers, caisson foundations, steel grillages, and directly embedded steel poles are partially excavated, cleaned and inspected. Repairs are made as required. Steel components are coated with a moisture-cure urethane to prevent rust, and concrete encasements are resurfaced if any cracks or spalls are present (see *Attachment 9.1.5 (confidential) – Steel Structure Foundation Inspection*).
- ***Steel Structure Painting (Every 20 years)*** During steel structure painting, steel structures are surface prepared (if required) and then repainted in accordance with paint manufacturers’ recommendations (see *Attachment 9.1.6 – Steel Structure Painting*).

Vegetation Management NGUSA has an extensive vegetation management program and thorough plans for its implementation. It is described in a comprehensive vegetation management strategy (VMS) and detailed vegetation management procedures (VMPs). Vegetation management documents are listed in Table 9.1.1.

Table 9.1.1 – Vegetation Management Program

Document Title	Designation
Vegetation Management Strategy (VMS)	Version 3.0
Vegetation Management Procedures (VMP), including: <ul style="list-style-type: none"> • TROW Floor Specification • TROW Sideline Specification • Right-of-Way Vegetation Mowing Specification 	Version 4.0

The VMS defines:

- strategies for all phases of vegetation management on ROWs;

- clearance requirements between conductors and vegetation acceptable to NGUSA for maintaining reliable electric transmission service; and
- responsibilities of company personnel.

The VMP defines:

- the approved procedures and practices for vegetation management;
- the process for imminent threat condition due to vegetation; and
- voltage classes applications.

The primary objective of NGUSA's VMS and VMPs is to minimize service interruptions caused by vegetation. Other objectives include providing a clear and safe workspace and access for maintenance activities.

In accordance with North American Electric Reliability Corporation requirements, vegetation patrols of all rights-of-way with lines of voltages of 345kV and above are conducted annually, and intervals between patrols do not exceed 18 months.

Vegetation strategy personnel are responsible for work plans, permits, policies, procedures, and working with state and federal regulators. Vegetation operations personnel are responsible for all vegetation management activities, including oversight of all vegetation contractors, contractor procurement, scheduling, Q&A, and budget tracking.

For further information, see *Attachment 9.1.7 – Vegetation Management Strategy; Attachment 9.1.8 – Vegetation Management Procedures; Attachment 9.1.9 – TROW Floor Specification; Attachment 9.1.10 – TROW Sideline Specification; and Attachment 9.1.11 – Mowing Specification.*

Clearance and Control [REDACTED] NGUSA has numerous transmission line interconnections with other utilities and is accustomed to coordinating with substation owners/operators at remote-ends of NGUSA-owned transmission lines. NGUSA's *Clearance and Control Procedures EOP G014 (Attachment 9.1.12)*, *Transmission Personnel Protection Grounding Procedures EOP T011 (Attachment 9.1.13 (confidential))* and *Operation of Inter-Utility Transmission Facilities Operating Procedure OP-97 (Attachment 9.1.14)* address all necessary procedures associated with operating a transmission line when one or both substation remote-ends is not owned/operated by NGUSA.

EOP G014 provides personnel safety, maintains integrity of service, and protects apparatuses used in the transformation, transmission, and distribution of electrical energy. EOP G014 applies when isolating overhead and underground transmission circuits, overhead and underground distribution circuits, and substation apparatuses. The National Grid system operator directs this process through the use of disconnecting devices, tagging and documentation.

NGUSA's Local Control Center (LCC) provides system security services in support of ISO-New England (ISO-NE) and on behalf of NGUSA subsidiaries with operations in Vermont, New Hampshire, Massachusetts and Rhode Island, 29 municipal electric companies, and two investor-owned utilities. The LCC staff and facilities are provided, operated and managed by NGUSA Service Company. In addition to the services it provides in support of ISO-New England, the LCC also performs services on behalf of National Grid's New England Power Company (NEP), a subsidiary of NGUSA, that sustain NEP's compliance with NERC Reliability Standards. The LCC is operated 24/7/365. Control room staff (security/system operators and management) are NERC Reliability Coordinator certified.

The Primary Transmission Control Center (TCC) is in NGUSA's Special Purpose facility, which houses other electric and gas control centers. The building is surrounded by 7-foot fencing and there are three access control points to enter the TCC — front gate, exterior doors and interior doors. Proximity card access is required by all employees. Access into the transmission area and TCC is dual factor authentication (i.e., access card and PIN). There are cameras and alarms on each entry point that are monitored by the Security Control Center, also housed within the building.

NGUSA's New England Energy Management System (EMS) uses Inter-Control Center Communications Protocol (ICCP) to exchange real-time data between ISO-NE and other operating entities in New England. Currently, all connections are running in a fully secure mode with authentication and encryption over a redundant frame relay network. The data exchanged is primarily transmission and generation status and measurements (e.g., breakers, disconnects, megawatts, mega volt amps, kilovolts, Hertz, tap positions, and system, ties, loads, reserves, interface limits and miscellaneous). Status data is received by exception and via a periodic integrity scan. Analog data is received based on a periodic interval timeout (typically five seconds or longer), except generator limits, modes, and set-points are received by exception.

[REDACTED] Electric power is supplied from diverse transmission and distribution lines. A backup generator supplies power in the event of a loss of the normal power supply. Additionally, an uninterruptable power supply provides for power continuity to the BCC workstations.

The BCC is fully enabled with back-up SCADA/EMS servers that are synchronized from the primary EMS in real-time via the subscription service that is part of the ABB Network Manager EMS. In near real-time, the BCC is kept up-to-date with all changes occurring to the online EMS.

NGUSA also has a detailed procedure *Helicopter Utilization and Notification - EOP T012 (Attachment 9.1.15)* for the use of helicopters, including for post-fault patrols.

Spare Parts, Structures, and/or Equipment NGUSA stores a complete inventory of spare parts for routine operations and emergency response at supply depots located in New England and New York. Specialized material, specific to transmission lines located in a geographical area, are located in emergency storage units located throughout New England and New York. Further, additional materials for specific projects are on hand and are diverted when needed to speed response times.

NGUSA also maintains an inventory of Lindsey Emergency Restoration System (ERS) materials and installation equipment, which can be utilized to rebuild transmission lines damaged from severe storms, wildfires or other infrequent occurrences. NGUSA's internal transmission line department conducts training drills to familiarize crews with the Lindsey ERS and improve their ability to transport and erect the towers in the event of an emergency.

Emergency Response NGUSA has award-winning expertise in emergency response. It has established Electric Emergency Response Plans (ERPs) to manage outages due to storms and other natural disasters, civil unrest, major equipment failure and other events. These ERPs are simple, flexible and easily adapted to specific emergencies. They include procedures that are followed when an emergency occurs.

National Grid received the EEI 2016 Emergency Recovery Award for a significant snowstorm event in February 2016.

The ERPs are the framework for the orderly and timely response of resources during emergency events. These procedures provide instructions for actions to be taken during emergency events classified as Type 1, 2 and 3. The ERPs use the National Incident Management System (NIMS), a comprehensive national approach to incident management applicable at all levels of NGUSA's Emergency Response Organization (ERO) and across functional disciplines. It is focused on public safety, workforce safety and safety of outside assistance and addresses the operation of Emergency Operation Centers (EOCs).

The ERPs were developed in accordance with all applicable regulations and are designed based on the principles of Incident Command System (ICS) and the NGUSA's Group Crisis Management Framework. NGUSA conducts training, drills and exercises annually to evaluate the effectiveness of the ERPs, with the Emergency Response Functional Exercise completed by August 1 each year. The ERPs are also reviewed and revised no later than May 15 each year.

The annual review and revision includes improvements resulting from the After Action Report from the annual Emergency Response Functional Exercise. However, the ERP may be revised more frequently based on recommended changes from a storm review or After Action Report, or regulatory or legislative directives.

The new line will be incorporated into these plans (see *Attachment 9.1.16 (confidential) – Electric Emergency Response Plan for Massachusetts* for further details).

Damage Assessment and Emergency Repairs NGUSA's New England Transmission Line Services (TLS) department has extensive capabilities to manage and/or perform damage assessment and emergency repairs. The TLS department includes 10 highly experienced managers and supervisors and over 50 line workers, plus field support staff such as utility workers, equipment operators and welders. Line workers must pass a rigorous five-day field test even before being hired, and over the next several years they attend formal classroom training at the dedicated Millbury Training Center and must pass numerous on-the-job skill assessments as they advance through a rigorous progression path. Those unable to meet the high standards are not retained. At the top end of this progression line workers are able to perform energized bare-hand work on all transmission voltages. Annual training is conducted for all skill levels. TLS also has at its disposal 30 pieces of equipment specifically manufactured for work in rugged rights-of-way, including cranes, skidders, dozers and amphibious vehicles. They also have another 50 pieces of equipment such as bucket, tool and welding trucks for work in areas with developed access roads. The Transmission Line Maintenance department (TLM) has contracts with multiple helicopter service firms prepared to quickly transport experienced TLM patrollers in the event of a fault. Patrols are conducted for trips and recloses, as well as for lock-outs in accordance with procedures detailed in *Attachment 9.1.17 - Post Interruption Line Patrols TOP-18*. NGUSA's prospective service provider has comparable capabilities.

See *Attachment 9.1.16 (confidential) – Emergency Response Plan for Massachusetts* for further details.

Emergency Repair and Testing Emergency repairs or imminent vegetation hazard identified during routine maintenance inspections will be corrected similar to the response to forced outages detailed above, including assessment, management and resourcing. In addition, imminent vegetation hazards follow the P5 procedure within the *Vegetation Management Procedures (Attachments 9.1.8 – 9.1.11)*.

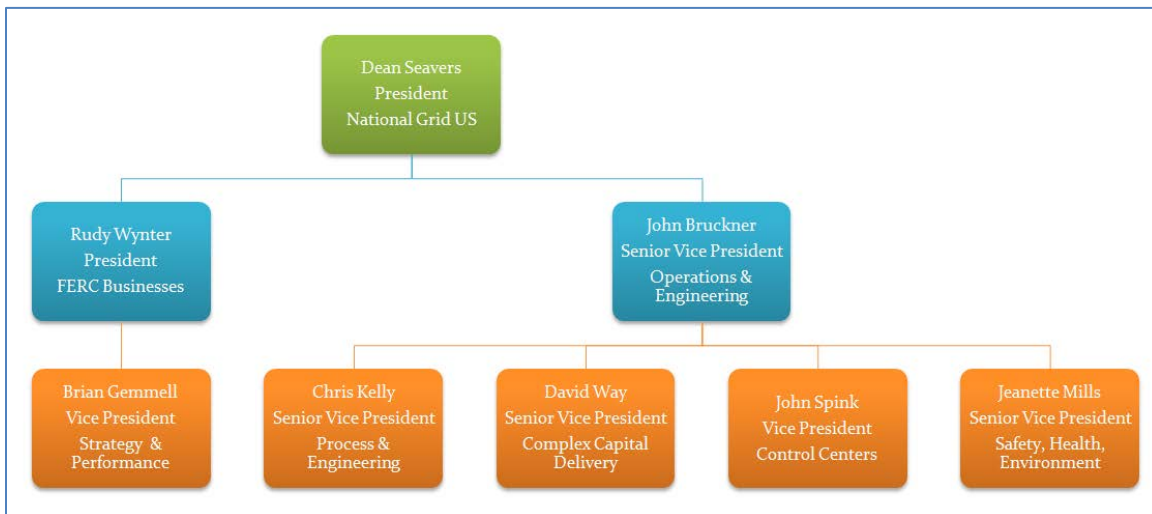
Safety Assurance & Risk Management Plan As an existing owner/operator on an extensive electric transmission system, NGUSA has an all-encompassing safety program for construction, operations and maintenance of electric transmission lines. Specifically, there are detailed policies for:

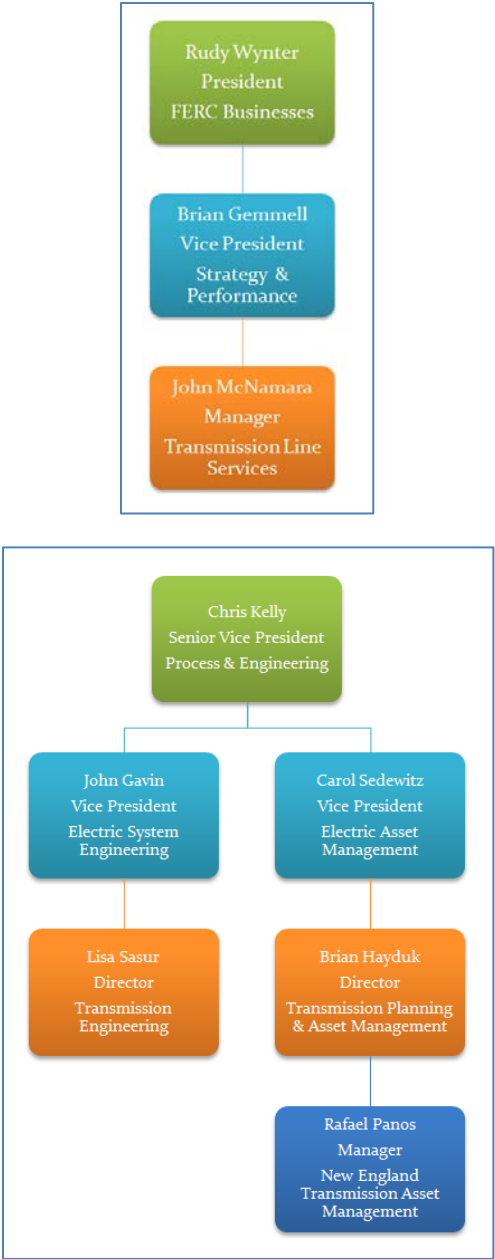
- Contract safety requirements
- Employee safety
- Clearance and control
- Grounding guidelines
- Transmission personnel protection grounding
- Process hazard analysis

All of these procedures can and will be applied to the construction, operations and maintenance of the proposed line.

See *Attachment 9.1.18 - Employee Safety Handbook*; *Attachment 9.1.19 - Contractor Safety Requirements*; *Attachment 9.1.20 - Arc Flash Awareness and Mitigation*; and *Attachment 9.1.13 (confidential) - Transmission Personnel Protection Grounding* for a representative sample of safety procedures.

Transmission O&M Organizational Depth: To demonstrate the strength and depth of expertise upon which GridAmerica can draw within NGUSA, elements of the NGUSA organization that will provide operations and maintenance and related support services are presented in Figure 9.1.1.





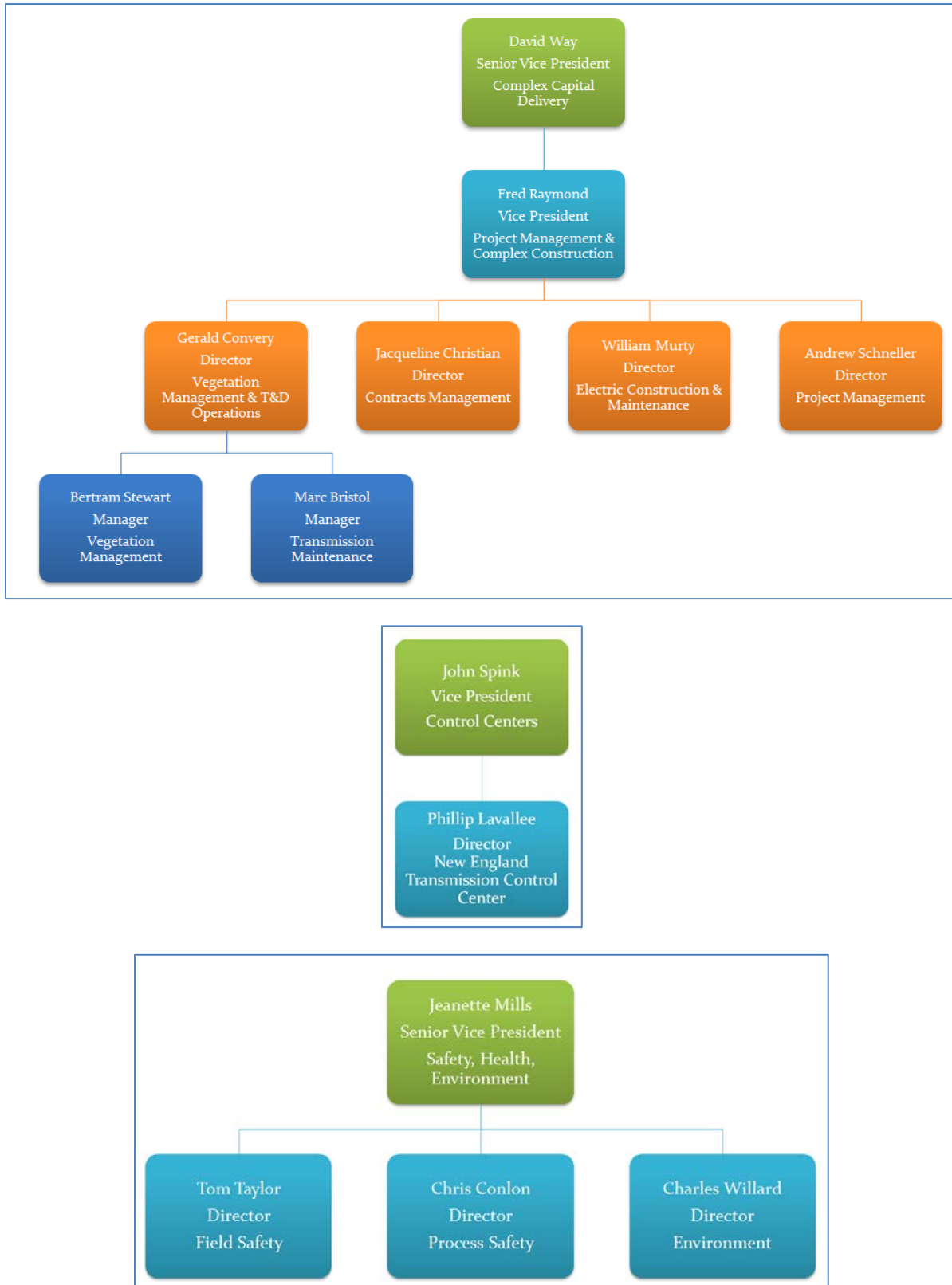


Figure 9.1.1 – National Grid US - Operations and Maintenance Organization

RES Canada: Operations and Maintenance Plan

1) Role of project sponsor and outside contractors:

RES Canada's O&M plan comprises the following activities:

- **Financial and Commercial:** cash management, statutory accounting, financial reporting, forecasting
- **Project Management:** spares & procurement, vendor O&M management, EH&S and community relations
- **Monitoring and Reporting:** RES' 24/7 Control Centre, SMART data management, emergency incident response
- **Engineering and Technical:** on demand performance optimization, condition monitoring, end of warrantee assessment

The turbine vendor will be responsible for turbine maintenance during the initial 3 to 5 year post-COD period, in keeping with the vendor's warrantee period. Upon expiry, RES Canada will assume turbine service tasks, including scheduled and unscheduled maintenance, predictive maintenance, major component exchange and life extension activities.

RES Canada will also perform all project requirements in terms of maintaining balance of plant assets, including civil maintenance (roads, foundations), electrical maintenance (collector system, transformer testing, high voltage, SCADA) and general programs (EH&S, snow removal, grading, etc.).

The organizational and contractual structure in relation to a project entity would be as follows:

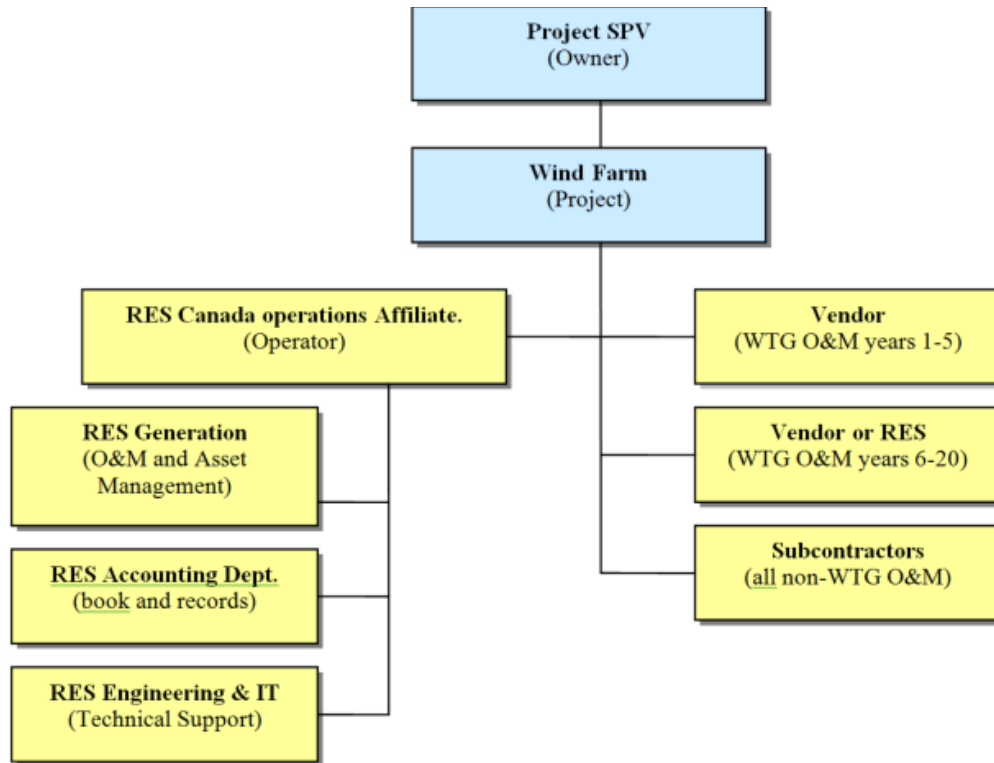


Figure 9.1.2 RES Canada Operations and Maintenance Organization

2) Service Schedule

I. Wind Turbine

- WTG service per vendor and contracted requirements
- Routine SMW works

II. Electrical

- Quarterly Inspection: Inspect 34.5/69 kV Transformer, check oil level, take oil sample, check silica gel and replace when necessary, record number of tapchange operations, inspect substation switchboard and record circuit breaker position, check all instruments and relays indications, inspect and report on site security, check battery electrolyte level and top up as necessary.
- Annual Inspection (Yearly Maintenance): Inspect all substations including security of housing, inspect transformer for oil- compound levels and report on condition of paintwork.
- Check and verify all substation protection equipment is functioning. Verify alarm logs for operations and errors.
- Visually inspect all substation switches and outdoor equipment.
- Perform battery charge test.
- Perform infrared inspection of switchyard.
- Maintain 34.5/69kV Transformer. Take additional oil samples at least each quarter to monitor condition post repair.

- Check LV cable box connections.
- Check integrity of all earth/bonding connections.
- Relay testing

III. Site

- Weekly inspection - environmental and civil – action as needed
- Snow removal as required
- Annual inspection and grading of roads
- Weekly site safety inspection
- Annual site safety audit

Table 9.1.2 Main Service Plan – 5 year look ahead

COD: Dec 1, 2022	2023	2024	2025	2026	2027
WTG	Routine Service Annual Service	Routine Service Annual Service	Routine Service Annual Service	Routine Service Annual Service	Routine Service Annual Service
Electrical	Quarterly Annual	Quarterly Annual Reactive and AVR testing PFR testing	Quarterly Annual	Quarterly Annual Reactive and AVR testing PFR testing	Quarterly Annual Five Year
Site	Weekly Inspection Environmental and Civil – Action as needed. Annual Inspection and grading of roads	Weekly Inspection Environmental and Civil – Action as needed. Annual Inspection and grading of roads	Weekly Inspection Environmental and Civil – Action as needed. Annual Inspection and grading of roads	Weekly Inspection Environmental and Civil – Action as needed. Annual Inspection and grading of roads	Weekly Inspection Environmental and Civil – Action as needed. Annual Inspection and grading of roads

3) Staffing Levels and Operational Management

Typically an on-site staffing of 10 to 15 is sufficient to maintain a Project of between 200 MW and 300 MW. Operational management represents the key staffing roles to support on-site O&M services, as summarized below:

- RES Canada's operations affiliate will operate and manage the site, with central support from RES Americas' generation, accounting and engineering departments and additional support from RES Ltd. generation and engineering teams.
- Key Operations Personnel:
 - RESVP – Senior Vice President Operations – Location: Broomfield,
 - RESAOM – Area Site Operations Manager – Location: Site 60% of time or Montreal
 - RESASM – Assistant Site Manager – Location: Site
 - RESTEC – WTG tech - Location: Site
 - RESWTG – Turbine Engineer – Location: Montreal
 - RESWTG – Operations Engineer – Location: Montreal
- Support from RES Americas (Broomfield, CO):
 - Senior Electrical Design Engineer
 - Manager, Generation Accounting
 - Director, Energy Resource
- Support from RES Ltd. (London or Glasgow, UK):
 - Engineering Manager
 - Senior Electrical Engineer
 - 24/7 Control Centre

9.2 Describe in detail the proposed O&M funding mechanism and funding levels to support planned and unplanned O&M requirements.

GSPL Project

GridAmerica's parent, National Grid, has extensive experience in owning, operating and maintaining high voltage AC and DC electricity transmission assets throughout the northeastern US, and, together with GE, the preferred converter manufacturer, GridAmerica has considered planned and unplanned maintenance activities over the life of the transmission assets. GridAmerica expects the funding of both planned and unplanned O&M activities to be covered by positive cash flow from the project's revenue streams. To the extent that an unplanned O&M requirement exceeds the positive cash flow, the cost will be covered by NGUSA credit and completely at the risk of shareholders, not ratepayers.

The total anticipated cost of funding the planned and unplanned O&M associated with the GSPL Project over a 40-year period is included in the GSPL Project offer and bid price. Please refer to Section 14.2.vi for more detailed information.

RES Canada Portfolio

[REDACTED]

The financial pro-forma prepared by RES Canada in the submission of this bid makes specific assumptions on operating expenses of the project, based on RES Canada's many years of experience.

[REDACTED]

- 9.3 Describe the terms (or expected terms) of the warranties and/or guarantees on major equipment that the bidder is utilizing or proposing to utilize.

GSPL Project

Converter Stations:

GridAmerica is working with GE to provide the converter solution for the GSPL Project. Commercial discussions have not been concluded, however, from recent engagement with the HVDC market and contracts placed in the last year by National Grid, GridAmerica would typically expect to secure an EPC contract with warranties and guarantees as provided in *Attachment 9.3 (confidential) – Warranties and/or Guarantees on Major Equipment*.

HVDC Transmission Line:

Typical warranties on steel pole structures extend from three to five years following the acceptance of the steel pole structure on site for a project. The same general timeline is applicable to conductor and shield wire. Terms and conditions associated with the length of warranty vary based on the project and installation schedule associated with each component.

RES Canada Wind Portfolio

RES Canada has obtained pricing quotes from turbine vendors for 5 year service contracts under standard industry terms and conditions, as negotiated by RES Canada on previous eastern Canadian and Quebec projects.

At this early stage, terms and conditions for other major equipment (main substation electrical components and those related to the TSO's assets) have not been negotiated; however they shall be in line with industry practice.

- 9.4 Describe the status of the project sponsor in securing any O&M agreements or contracts. Include a discussion of the sponsor's plan for securing a medium-term or long-term O&M contract, including the expected provider of O&M services.

GSPL Project

As described in Section 9.1, GridAmerica's parent, National Grid, has extensive capabilities to manage and/or perform the operations, inspection, maintenance, clearance and control of the GSPL Project. Such services would be under contract to GridAmerica and fully reimbursed.

While retaining responsibility for managing the operations and maintenance, GridAmerica will

likely select partners to provide specific services to increase efficiency and provide faster response. For the HVDC transmission line, those services would include field maintenance and emergency response. For the AC to DC converter stations and the Norton AC switching station, those services would include on-site operations, maintenance, and emergency response.

The contract for the transmission line services is presently being negotiated with a service provider that has a major presence in the region. An agreement is expected to be completed by October 2017.

The contract for the converter stations and AC substation services are presently being negotiated with GE, a worldwide leader in HVDC technology. An agreement is expected to be completed after the project is awarded.

RES Canada Wind Portfolio

RES Canada is unique as a project sponsor in its vertically-integrated role as project developer, constructor, and operator. RES Canada has internally estimated its cost to manage the assets for each of the Mistissini and Vauban projects under its own scope, and has also obtained price quotes from turbine vendors for 5 year service contracts under standard industry terms and conditions negotiated by RES Canada on previous eastern Canadian projects.

Upon selection and approaching project financial close, RES Canada, through a Canadian wind operation affiliate will contract with the project entity for asset management and overall operational control of the facility under a Management, Operations, Maintenance and Administrative Agreement ("MOMA"). Under this agreement, RES Canada will be responsible for managing the turbine O&M contractor and hiring and managing the electrical contractors and site maintenance contractors.

The major contracts and planning items associated with the Mistissini and Vauban projects are summarized below. It is anticipated that the turbine vendor will provide initial turbine service, maintenance and warranty for the initial five years of operations under the Vendor Agreement. After the initial period, RES Canada would enter into a contract for turbines operations and maintenance with the project entity.

Contract/Planning Item	Time Period
Project Budget	Annually
Operating Plan	Annually
MOMA	Renewed 3-5 years
Vendor Agreement	3 -5 years (option to renew)
Non-WTG Contracts	(T&M) as required
WTG O&M Contract post SMWA	3-5 years as required

9.5 Provide examples of the bidder's experience with O&M services for other similar projects.

GSPL Project

As a subsidiary of NGUSA, GridAmerica is able to draw on the full capabilities of its parent. National Grid plc is one of the world's largest investor-owned utilities focused on transmission and distribution activities through its subsidiaries in electricity and gas in both the UK and the U.S. NGUSA, through its subsidiaries, play a vital role in connecting millions of people to the energy they use, safely, reliably and efficiently. NGUSA, through its subsidiaries, engineers, designs, permits, constructs, owns and operates transmission facilities across upstate New York, Massachusetts, New Hampshire, Rhode Island and Vermont and owns and operates electricity distribution networks in upstate New York, Massachusetts and Rhode Island. Its network includes more than 8000 miles of transmission lines and nearly 1200 transmission and distribution substations.

National Grid plc also operates the electricity transmission network in England and Wales, with day-to-day responsibility for balancing supply and demand. The network there comprises nearly 4500 miles of overhead lines, nearly 1000 miles of underground cable and over 300 substations. A summary of National Grid's transmission network is presented in Table 9.5.1.

Table 9.5.1 National Grid Transmission Networks

Location	Type/Voltage	Miles
US & UK	AC 115kV to 400kV	18,617
US	AC 115 to 345kV	8,410
US	DC 450 +/-kV (dual pole)	133

National Grid has unrivalled experience managing teams of multiple partners to design and build reliable HVDC infrastructure projects in the U.S. and UK, and in operating this infrastructure on a day-to-day basis. Our project teams succeed in part due to National Grid's skillful management of the interfaces between partners to ensure fully-integrated, seamless delivery for our customers.

NGUSA with its partners developed, constructed, and commissioned the world's first multi-terminal high-voltage DC network. The 2000 MW interconnection between Canada and the US imports approximately 10% of ISO-NE capacity daily. National Grid now operates the New Hampshire and Massachusetts portion of the network on behalf of an ownership group comprising participating utility companies. A highly-skilled full-time staff of 22 employees operates the Sandy Pond DC-AC converter terminal in Ayer, Massachusetts and has maintained a record of more than 99% availability against forced outages. Inspection, maintenance and emergency response are provided for the HVDC line by National Grid in the same manner as for its AC lines.

National Grid's operational interconnector businesses in Europe include the Interconnexion France-Angleterre (IFA) interconnector between the UK and France, and the BritNed interconnector, between the Isle of Grain in Kent and Maasvlakte, near Rotterdam. IFA has been operational since 1986 through a joint venture with Réseau de Transport d'Electricité (RTE). BritNed has been operational since 2011 through a joint venture with TenneT. Both operational interconnectors are formatted with Line Commutate Converter (LCC) stations and High Voltage DC (HVDC) cables.

National Grid's on-site U.S. staff has extensive expertise in the management, engineering, design, construction, operation and maintenance of high voltage AC and DC transmission lines. Further, it has a network of line engineering and design firms, construction contractors, vegetation management contractors, material suppliers and other external specialists with national reputations to assist it.

Table 9.5.2 presents a summary of the approximate US staffing levels and experience for some key technical specialties.

Table 9.5.2 National Grid USA Staffing

Function	Employees	Average Experience (yrs)
Transmission Planning & Asset Management	53	15
Substation Engineering & Design	84	16
Substation Civil & Structural	12	10
Substation O&M Services	16	16
Transmission Engineering	40	10
T&D Operation & Maintenance Services	38	25
Telecommunications Engineering	10	20
Protection Engineering, Control & Integration	48	12
Vegetation & Forestry Management	10	19
Forestry Supervisors	33	19
Project Management	51	11
Construction Supervisors	77	21
Construction Planners	12	17
Stakeholder Management	5	14
New England Control Center	30	19

RES Canada Wind Portfolio

RES Group has operated nearly 480 MW of owned wind, solar, and energy storage projects and a further 870 MW on behalf of clients. Sample clients include Allianz Group, Enbridge, Octopus Investments, Glennmont Partners. This includes 202 MW of wind and storage projects in eastern Canada.

The figures below provide examples of relevant, global O&M experience.

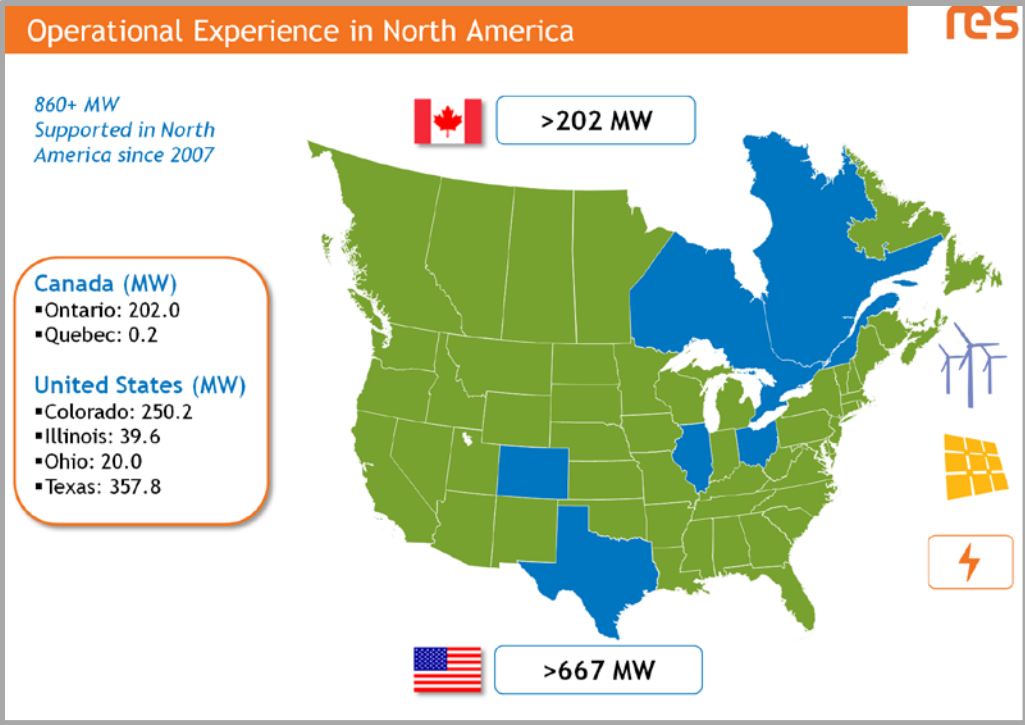


Figure 9.5.1 Operational Experience in North America

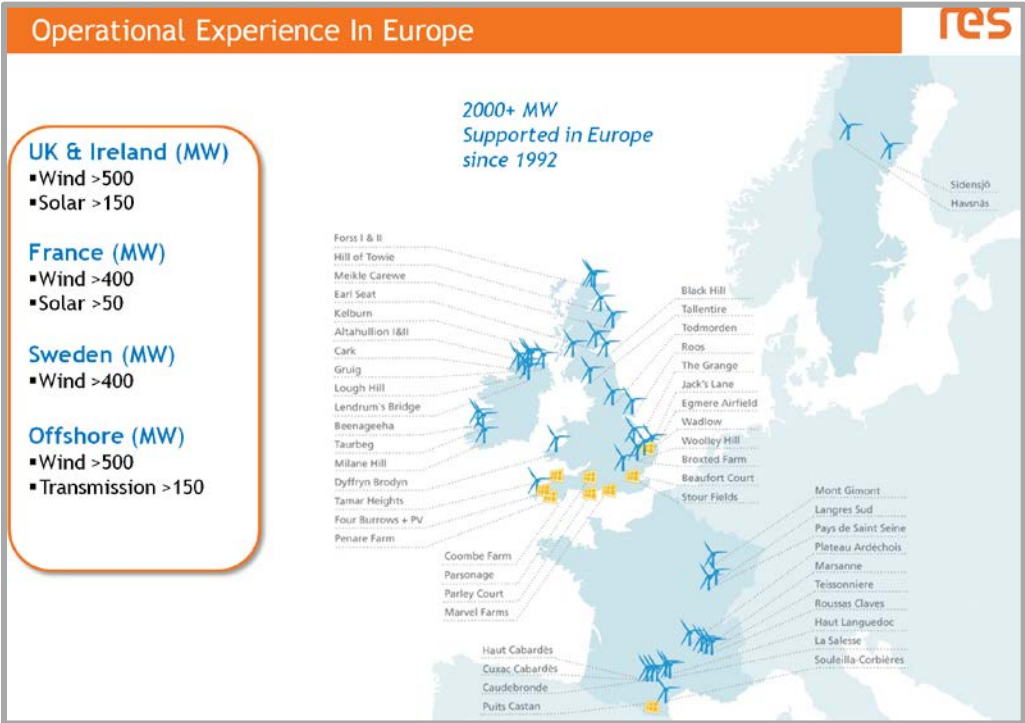


Figure 9.5.2 Operational Experience in Europe

SECTION 10 OF APPENDIX B TO THE RFP PROJECT SCHEDULE

A bidder must demonstrate that its proposal can be developed, financed, and constructed and be technically viable within a commercially reasonable timeframe. The bidder is required to provide sufficient information and documentation that shows that the bidder's resources, process and schedule are adequate for the acquisition of all rights, permits and approvals for the project and for the financing of the project consistent with the proposed project milestone dates.

For Eligible Generation Facilities or Transmission Projects that are not yet in-service, bidders are required to provide a complete critical path schedule for the project from the notice of selection of the project for contract consideration to the start of commercial operations. For each project element, list the start and end date.

- 10.1 Identify the elements on the critical path. The schedule should include, at a minimum, preliminary engineering, financing, acquisition of real property rights, Federal, state and/or local permits, licenses, environmental assessments and/or environmental impact statements (including anticipated permit submittal and approval dates), completion of interconnection studies and approvals, procurement, facility contracts, start of construction, construction schedule, fuel supply, and any other requirements that could influence the project schedule and the commercial operation date.

GSPL Project

For a complete project schedule, including the timing of critical path elements from development through commissioning, please refer to *Attachment 10.1.1 (confidential) – GSPL Project Schedule*. GridAmerica anticipates commercial operation of the GSPL Project in Q4 2022.

RES Canada Wind Portfolio

The project schedules including all the elements of the critical path for both clean energy generation projects can be found, for the Mistissini Project, in *Attachment 10.1.2 (Confidential) – Mistissini Project Schedule* and, for the Vauban Project, in *Attachment 10.1.3 (Confidential – Vauban Project Schedule)*. Both projects are planned to reach commercial operation before the end of 2022.

- 10.2 Detail the status of all critical path items, such as receipt of all necessary siting, environmental, and ISO-NE approvals.

GSPL Project

For details regarding the status of key critical path elements for the GSPL Project from development through commissioning, please refer to *Attachment 10.2 (confidential) - Status of GSPL Critical Path Elements*.

Mistissini Project

The typical critical path items allowing the construction of the project in time for commercial operation by the end of 2022 is described as follows:

- **Land Rights**

The project is located on public land. These lands are managed by the Ministry of Energy and Natural Resources (MENR) which issued a Letter of Intent confirming that the rights to install wind power facilities would be awarded to RES Canada upon signature of a long term clean energy contract. The letter of intent was issued in July 2017 in preparation for the bid, and the land rights reservation process is planned to start upon signature of the PPA, in March 2018. The governmental decree authorizing the export of electricity from public lands by privately-owned companies is planned to be issued in August 2018 and the land rights leases are expected to be signed prior to construction in February 2021.

- **Environmental Assessment Process (EA)**

The Environmental Assessment process is planned to be launched in November 2017, prior to the announcement of the selected projects by the Massachusetts Department of Energy Resources. For this specific project, the process is managed by the COMEV (see detailed process in Section 7.2).

- Project Notice and COMEV Guidelines

The first step of the environmental assessment process is the filing of the project notice to the COMEV and MDDELCC. The notice is planned to be submitted on the 1st of November 2017. The MDDELCC then transfers the file to COMEV who is consulted on the scope of the ESIA and issues its guidelines. These guidelines are planned to be received early March 2018, in time to initiate the spring surveys.

- Surveys and Community Consultation

Wildlife surveys are planned to start as soon as March 2018. Geotechnical, socioeconomic, cultural, archeological, noise and all other environmental surveys will follow shortly thereafter and enable the holding of two public events to share information on the project with the communities and gather comments.

- Environmental and Social Impact Assessment

The Environmental and Social Impact Study could be completed by the end of 2018 and be submitted to the COMEX in January 2019 for their review and approval.

- COMEX Approval Process

As per their guidelines, the COMEX intends to take 2 months to review and approve the ESIA. Once approved the COMEX issues a notice to the MDDELCC.

- Certificates of Authorization and Other Permits

The COMEX approval of the ESIA will likely list a number of conditions which are then detailed in one or more Certificates of Authorization issued by the MDDELCC. These certificates generally authorize the various phases of the construction of the project (tree clearing, civil and electrical works, construction of the substation and the operations and maintenance building, erection of wind turbines and, finally, the operation of the projects). Since the COMEX Approval is planned to be issued in April 2019 and that construction of the project is meant to start in

April 2021, the filing of the demands for the Certificates of Authorization will be postponed to September 2020, allowing the required time to obtain these authorizations prior to the start of construction. Construction permits are also required from the municipal entities, depending on the bylaws in place locally and regionally.

[REDACTED]

Vauban Project

The typical critical path items allowing the construction of the project in time for commercial operation by the end of 2022 is described as follows:

- **Land Rights**

The project is located on public land. These lands are managed by the Ministry of Energy and Natural Resources (MENR) which issued a Letter of Intent confirming that the rights to install wind power facilities would be awarded to RES Canada upon signature of a long term clean energy contract. The letter of intent were issued in July 2017, in preparation for the bid and the land rights reservation process is planned to start upon signature of the PPA, in March 2018. The governmental decree authorizing the export of electricity from public lands by privately-owned companies is planned to be issued in August 2018 and the land rights leases are expected to be signed prior to construction, in February 2021.

- **Environmental Assessment Process (EA)**

The Environmental Assessment process is planned to be launched in February 2018, upon the announcement of the selected projects by the Massachusetts Department of Energy Resources. This process is managed by the Quebec Ministry of Environment (MDDELCC).

- Project Notice

The first step of the environmental assessment process is the filing of a project notice. The notice is planned to be submitted to the MDDELCC two weeks after the selected projects are announced, mid-February 2018.

- Surveys and Community Consultation

Wildlife surveys are planned to start as soon as March 2018. Geotechnical, socioeconomic, cultural, archeological, noise and all other environmental surveys will follow shortly thereafter and enable the holding of two public events to share information on the projects with the communities and gather comments.

- Environmental Impact Study

Environmental Impact Study could be completed and submitted to the MDDELCC in January 2019 for their review and approval.

- MDDELCC Approval Process

The ministry's approval process consists of various steps. When the impact study is deemed receivable, the ministry releases a demand for a public information process to the *Bureau d'audiences publiques en environnement* (BAPE). Once the BAPE has made its recommendations to the ministry after having held public information sessions, the ministry releases an acceptability notice and recommends the project to the minister. This approval process can take 12 to 18 months and is planned to be completed by May 2020.

- Governmental Decree

The governmental decree is issued by the Cabinet of Minister's upon the recommendation of the Environment Minister and is the main permitting milestone authorizing the pursuance of the project. The Decree is planned to be issued in September 2020, thus giving considerable time to obtain all other required permits and construct the projects for the Q4 2022 deadline.

- Certificates of Authorization and Other Permits

The governmental decree lists a number of conditions to the execution of the projects which are then detailed in one or more Certificates of Authorization issued by the MDDELCC. These certificates generally authorize the various phases of the construction of the project (tree clearing, civil and electrical works, construction of the substation and the operations and maintenance building, erection of wind turbines and, finally, the operation of the projects). Construction permits are also required from the municipal entities, depending on the bylaws in place locally and regionally.

[REDACTED]

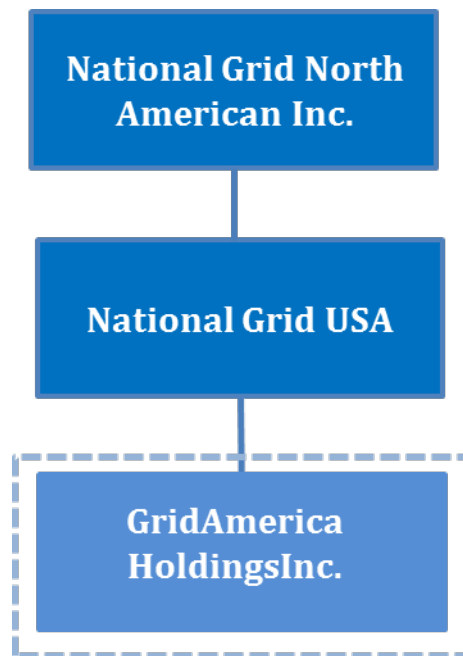
SECTION 11 OF APPENDIX B TO RFP PROJECT MANAGEMENT/EXPERIENCE

Bidders are required to demonstrate project experience and management capability to successfully develop (for a project that includes new facilities or capital investment) and operate the project proposed. The Distribution Companies are particularly interested in project teams that have demonstrated success in projects of similar type, size and technology and, for projects that include new facilities or capital investment, can demonstrate an ability to work together effectively to bring the project to commercial operation in a timely fashion.

- 11.1 Provide an organizational chart for the project that lists the project participants and identifies the corporate structure, including general and limited partners.

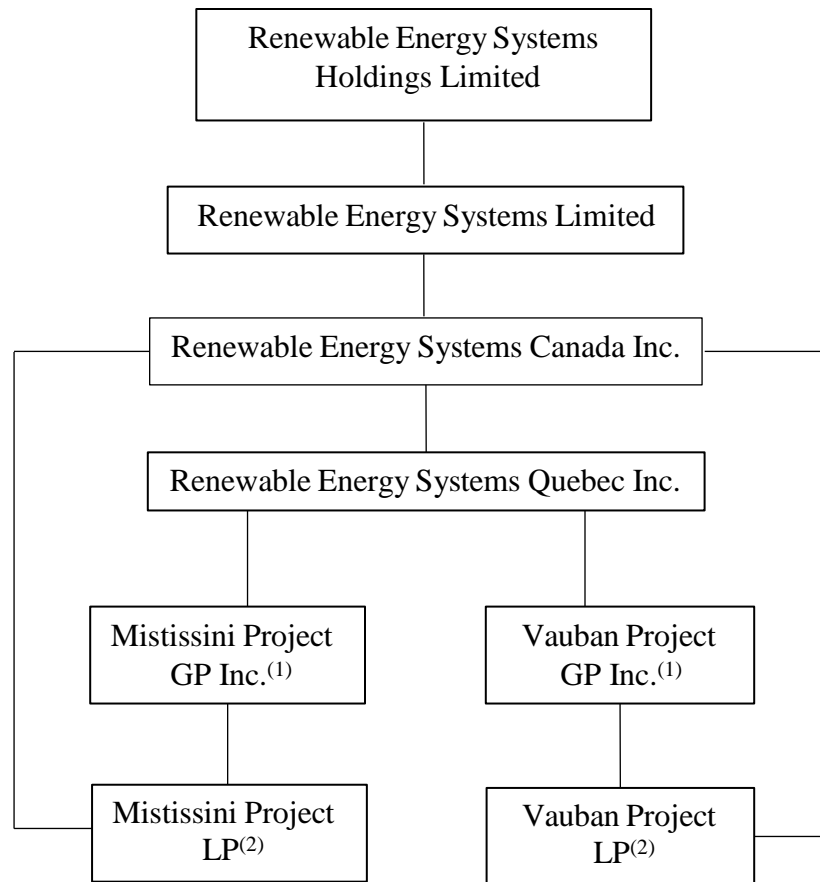
GSPL Project

Granite State Power Link (GSPL Project) will be held by a new project-specific company to be set up as a direct wholly-owned subsidiary of GridAmerica Holdings Inc. (GridAmerica), and GridAmerica is a wholly owned subsidiary of National Grid USA (NGUSA).



RES Canada Wind Portfolio

The Mistissini and Vauban projects will each be held by a new project-specific company to be formed. Please refer to Section 5.2(a) for details of the corporate structure.



Notes:

(1) Corporation to be formed as general partner of the limited partnership

(2) Limited partnership to be formed

Figure 11.1.2: Ownership structure for the Mistissini and Vauban projects

- 11.2 For a project that includes new facilities or capital investment, provide statements that list the specific experience of the bidder and each of the project participants (including, when applicable, the bidder, partners, EPC contractor and proposed contractors), in developing, financing, owning, and operating generating or transmission facilities (as applicable), other projects of similar type, size and technology, and any evidence that the project participants have worked jointly on other projects.

GridAmerica Experience

National Grid USA (NGUSA) and its subsidiaries, together with other subsidiaries of National Grid plc (collectively, “National Grid”) has an extensive track record in developing and financing transmission projects in both the U.S. and the UK. National Grid’s experience comes from managing and developing its transmission networks and developing HVDC interconnectors. National Grid is one of the partners behind the 2000 MW Interconnection France-Angleterre interconnector between Great Britain and France and the 1000 MW BritNed Interconnector between Great Britain and the Netherlands. National Grid is currently partnering on two

additional projects using Voltage Source Converter (VSC), the same technology proposed for the GSPL Project: North Sea Link (NSL) connecting Great Britain to Norway and NEMO Link, Ltd. (NEMO) connecting Great Britain to Belgium. National Grid has been building large HVDC transmission lines for many years. A few recent examples are listed below.

IFA Interconnector Project & IFA-2

In 1975, National Grid and RTE went into joint partnership to develop an interconnector between Great Britain and France. This project comprises of two 1000 MW bi-pole HVDC interconnectors that connect Sellindge in Great Britain with Bonningues-lès-Calais in France. The interconnector spans 73km and became operational in 1986. IFA-2 is a second interconnector to France and will be completed by 2020.

BritNed Interconnector Project

In 2007, National Grid and TenneT partnered to develop an interconnector between the Netherlands and Great Britain. The interconnector became operational in 2011 and consists of a 1000MW bi-pole interconnector spanning 260 km between the Isle of Grain in Great Britain and Maasvlakte in the Netherlands.

North Sea Link and NEMO Link Interconnector Projects

National Grid is currently partnering on the development of two interconnector projects, North Sea Link and NEMO Link that will connect Great Britain to Norway and Belgium respectively. NSL will consist of a 1400MW bi-pole HVDC system and be a total length of 730 km. NEMO will be a 1000MW symmetrical monopole HVDC system with a total length of 140km. These projects are expected to come online in 2021 and 2019, respectively. Details regarding these interconnector projects are provided in Table 11.2.1.

Table 11.2.1. National Grid Examples of Collaborative Transmission Project Development

Name	Status	Country	Partner	Route Length (km)	Volt (kV)	Power (MW)	Year	Converter Tech	Cable Tech
IFA	Operation	UK	France	73	270	2000	1986	LCC	MI
BritNed	Operation	UK	Netherland	260	450	1000	2011	LCC	MI
Nemo Link	Construction	UK	Belgium	140	400	1000	2019	VSC	XLPE
IFA2	Construction	UK	France	240	320	1000	2020	VSC	XLPE
North Sea Link	Construction	UK	Norway	730	515	1400	2021	VSC	MI

National Grid has worked extensively with other companies on these projects. Companies National Grid has worked with collaboratively include RTE (French Transmission System Operator), TenneT (Dutch Transmission System Operator), Elia (Belgian Transmission System Operator), Statnet (Norwegian Transmission System Operator), Siemens, MEPPI, Parsons and McPhee Electric.

In addition to interconnectors in Europe, National Grid has extensive experience of developing, constructing and operating high voltage lines in its normal course of business in New England.

NGUSA and its subsidiaries (collectively, National Grid) have extensive and recent examples of successful similar projects, which include the following:

New England East West Solution (NEEWS) – *Interstate Reliability Project IRP, Rhode Island Reliability Project (RIRP), and Advanced NEEWS Projects*

National Grid collaborated with Eversource Energy to construct a three-state transmission suite of projects that involved, among other things, the relocation, siting, and construction of new overhead 115kV and 345kV and reconductoring of existing transmission lines in Massachusetts, Rhode Island and Connecticut for a total length of 160 miles of transmission lines. The project went into service in 2015.

Merrimack Valley / North Shore Upgrade Area Project – The project was completed in 2013 and included the construction of a new 345/115kV gas-insulated substation at Wakefield, Massachusetts, a new 345/115kV substation in West Amesbury Massachusetts, building of a new 115kV line (K-163), as well as reconductoring of multiple 115kV lines and upgrades at other area substations in Northeastern Massachusetts.

Auburn Street Area Projects – These projects in Massachusetts were completed in 2012 and involved a complete rebuild of the 115kV and 345kV yards and addition of 345/115kV transformers at Auburn Street substation, as well as significant 115kV substation work at to other area substations.

Bloomdale to Vernon Hill – This project was completed in 2012 and involved a new 115kV cable in Worcester, Massachusetts

Hamden County Reliability Project (HCRP) – This project was completed in 2016 and included the design and construction of a new 10-mile 115kV R-170 transmission line from Palmer, MA to Hampden, MA, and a new substation in West Hampden.

Greater Boston and Southern New Hampshire Solution – National Grid is in the process of permitting and constructing a suite of projects that include the Merrimack Valley Reliability Project (MVRP), which is a new 345kV line project connecting southern New Hampshire to Massachusetts. National Grid's portion of the MVRP project is estimated at \$87 million. This project is also being constructed collaboratively with Eversource Energy, where Eversource is constructing a portion of the line in New Hampshire. In addition to the MVRP project there are many other 115kV line reconductoring and substation projects associated with this suite of work. All of the projects are expected to be in-service in 2018.

Salem Cable Rebuild - National Grid is in the process of rebuilding the two 115kV cables, each approximately 1.7 miles in length, in the City of Salem, Massachusetts. The project involves engineering, siting and constructing a complex cable system in the historic downtown section of the city. The project is currently in the construction phase and is expected to be complete in 2017.

Sandy Pond Controls Rebuild - National Grid owns and operates a high voltage direct current (HVDC) transmission line rated at ± 450 kV that is a key section of an interconnector between New England and Canada. National Grid operates the New England portion of the

interconnection known as Phase 2 between New England and Canada. Phase 2 includes HVDC transmission lines from La Grande Station, James Bay, Quebec to Des Cantons and from Monroe, New Hampshire to Sandy Pond Station in Massachusetts, and three converter terminals (Radisson, Nicolet, and Sandy Pond), which were placed in service in the early 1990s. Sandy Pond is a $\pm 2,000$ MW ± 450 kV DC bipolar converter terminal. This interconnection system from Quebec to Sandy Pond station in Massachusetts is the only large-scale multi-terminal HVDC system in the world today.

Sea2Shore - This project was completed in 2016 and involves an undersea transmission cable, approximately 20 miles in length, connecting the first off-shore wind farm in the US to Block Island, Rhode Island, and connecting into the National Grid's transmission network in Narragansett, Rhode Island.

RES Canada Experience

RES Group, through its various wholly-owned international subsidiaries, has 11 offices around the globe and has developed, financed, or constructed more than one hundred and sixty (160) wind and solar projects, with a combined capacity of over 12,000 MW of projects around the world, including in Europe, the United States of America, Canada, and Australia.

RES Canada has successfully planned, developed, financed, constructed, owned and/or operated 2,700 MW of wind energy generation in Canada, nearly 25% of the total capacity installed across the country. RES Canada has also developed and built solar, storage and transmission projects over the years, notably the 214 mile 230kV Montana-Alberta Tie Line.

RES Canada has also had unparalleled success in wind project development in Quebec in the 4 tenders launched by Hydro-Québec Distribution since 2003, having been part of all the major wind Consortiums including Saint-Laurent Énergies and Cartier Énergie. Overall, RES Canada has successfully closed 14 wind projects in the province totaling 1,300 MW. RES Canada is currently managing the construction of the Mont Sainte-Marguerite Wind Farm which won a contract in 2014 as part of the 2013-01 HQD tender.

RES Americas has close to 8,000 MW of renewable energy construction portfolio of which 3,500 MW were developed internally. RES Americas also has extensive operational experience managing over 1,000 MW of wind facilities in the past decade.

Mont Sainte-Marguerite Wind Farm – In Quebec, RES Canada is currently managing the construction of the 150 MW Mont Sainte-Marguerite Wind Farm which was awarded a PPA as part of the 2013-01 Hydro-Québec Distribution tender. The project, which will be comprised of 46 Siemens 3.2 MW wind turbines, is located on over 24,000 acres of privately-owned land. RES Canada originated the project in 2011 and succeeded in building overwhelming community buy-in through extensive consultation and through the establishment of a project partnership between the three local municipalities, Pattern Energy and RES Canada. Construction of the project began on December 1st, 2016 and it is expected to achieve COD on December 1st, 2017.

Massif du Sud Wind Farm – RES Canada originated and developed the 150MW Massif du Sud (MDS) windfarm in southern Quebec and it became part of the Saint-Laurent Énergies portfolio

of projects that were selected by Hydro-Québec Distribution in its 2005-03 tender. The MDS windfarm is located partially on public lands and partially on private lands and included a complex set of constraints and environmental issues to manage. RES Canada was able to manage these challenges and obtain the support of all four affected municipalities, both affected MRCs, and the Regional Environmental Council. The MDS project was subject of a BAPE (government environmental bureau evaluation) and received a positive recommendation and ultimately, a decree authorizing its construction. The MDS project was built on time and on schedule and remains a model of sustainable development, balancing environmental protection and low cost renewable energy, for Quebec. The MDS project was acquired by EDF-EN Canada as part of its purchase of the Saint-Laurent Energies portfolio and is currently owned by EDF-EN and Enbridge Inc.

Talbot Wind Farm – RES Canada developed, constructed, owned and operated the 98.8 MW Talbot Wind Farm which was awarded a PPA in the Ontario RES III competitive tender in 2010. Located mostly on privately owned land near Ridgetown in the Municipality of Chatham Kent, Ontario, the project is comprised of 43 Siemens 2.3 MW wind turbines. RES Canada was responsible for site origination, consultation, land work, and project permitting through Notice to Proceed (NTP), as well as planning and procurement. As balance of plant contractor, RES Canada managed all aspects of construction for the project, and after RES Canada sold its equity in the project to a third party following construction, it was retained to operate the facility for one year after COD from December 2010 until December 2011 and, as such was responsible for the ongoing maintenance of the facility.

Greenwich Wind Farm – RES Canada developed, constructed, owned and operated the 98.8 MW Greenwich Wind Farm which was awarded a PPA in the Ontario RES III competitive tender in 2010. Located mostly on provincially-administered Crown Land near Thunder Bay in Ontario, the project is comprised of 43 Siemens 2.3 MW wind turbines. RES Canada was responsible for site origination, consultation, land work, and project permitting through Notice to Proceed (NTP), as well as planning and procurement. As balance of plant contractor, RES Canada managed all aspects of construction for the project, and after RES Canada sold its equity in the project to a third party following construction, it was retained to operate the facility for one year after COD from December 2011 until December 2012 and as such was responsible for the ongoing maintenance of the facility.

Pleasant Valley Wind Farm – Renewable Energy Systems Americas Inc. (RES Americas) was awarded a PPA for the project following the Xcel Energy May 2013 competitive procurement process. RES Americas was responsible for all aspects of the development of the Pleasant Valley Wind Farm from its conceptualization to commencement of construction. RES Americas secured a \$222.3MM Construction Loan and achieved Financial Close in June 2014. RES Americas built the 200 MW project, which is located in Mower and Dodge County, Minnesota and comprised of 100 x V100 Vestas 2.0 MW wind turbines, and achieved COD in December 2015, at which point the project was sold to Northern States Power.

Hackberry Wind Farm – Hackberry Wind Farm, comprised of 72 x Siemens 2.3 MW MK2 wind turbines for a total capacity of 165.6 MW, is located in Shackelford County, Texas and was awarded a PPA in 2008 in a competitive procurement launched by Austin Energy. RES Americas was responsible for all aspects of the development of the Hackberry Wind Farm from its

conceptualization to commencement of construction. RES Americas secured a \$302.3MM Construction Loan, a \$167.8MM Term Loan and a Tax-Equity Investment by GE Energy Financial Services of \$135.2MM. Construction, managed by RES Americas, began in January 2008 and the project achieved COD in December 2008. The project is still owned and operated by RES Americas today.

A complete list of all the projects which are or have been developed, financed, owned and/or operated by RES Canada and other RES Group members is attached hereto as *Attachment 11.2 – RES Project Experience List*.

- 11.3 For a bid that includes existing facilities, provide statements that list the specific experience of the bidder and each of the project participants (including, when applicable, the bidder, partners, EPC contractor and proposed contractors), in owning and operating generating or transmission facilities (as applicable), other projects of similar type, size and technology, and any evidence that the project participants have worked jointly on other projects.

Not applicable as the GSPL, Mistissini and Vauban projects are all new facilities.

- 11.4 Provide a management chart that lists the key personnel dedicated to this project and provide resumes of the key personnel. For Eligible Facilities or Transmission Projects that are not yet in-service, key personnel of the bidder's development team having substantial project management responsibilities must have:
- i. Successfully developed and/or operated one or more projects of similar size or complexity or requiring similar skill sets; **and**
 - ii. For a project that includes new facilities or capital investment, experience in financing power generation projects (or have the financial means to finance the project on the bidder's balance sheet.

GSPL Project



Figure 11.4.1 GSPL Project – Development Phase Organization Chart

Will Hazelip – Vice President, GridAmerica Holdings, Inc.



Will Hazelip joined National Grid in 2015 and is responsible for a range of business development activities including pursuing growth opportunities in electric transmission. Before joining GridAmerica, Will spent seven years at Duke Energy, during which he led the acquisition and subsequent management of Path 15, a transmission line connecting northern and southern California transmission grids that plays a key role in maintaining statewide electric system reliability and market efficiency. He was also responsible for origination and development of new business opportunities for the non-franchise electric transmission unit in North America.

Joseph Rossignoli – Director, US Business Development



Joe Rossignoli has over 27 years of experience in transmission-focused business development, regulatory affairs and commercial activities. He is responsible for delivering project development opportunities in New England and the Midwest from concept to commercial operation. Mr. Rossignoli also oversees Granite State Power Link's commercial, permitting, technical, financial and regulatory development as well as partnering opportunities. He also progresses the company's other competitive infrastructure investments and is responsible for the due diligence review of prospective development-phase infrastructure investments. He has been

closely involved with commercial development and operation of the Quebec – New England HVDC Interconnector and played a key role in National Grid’s initial development of the Vermont Green Line, Maine Green Line and NEL projects.

Gerard R. Boivin, P.E. – Sr. Project Manager



Gerry Boivin has 30 years of experience in the areas of Power Delivery and Generation. He has served as Lead Project Manager for various projects and complexities involving new and existing assets from initial project development, land rights and acquisition, environmental licensing and permitting, preliminary and detailed engineering design, to construction and turnover to operations. Project highlights include siting and development of new transmission corridors and switchyard/substations and the expansion of existing transmission corridors and switchyard/substations for several multimillion-dollar area reinforcement projects. He also served as the Lead Utility Project Manager for the NERC Alert response for numerous 345kV and 115kV lines in Maine. Gerry is licensed as a professional engineer in the states of New Hampshire and Maine and serves as Vice Chair on his local Planning Board.

National Grid Professionals - *Granite State Power Link Financing, Construction, and Operations Phase*

For purposes of this paragraph, NGUSA and its subsidiaries, and National Grid plc and its other subsidiaries are collectively referred to as “National Grid.” National Grid is an international energy company whose U.S. operations are among the largest in the Northeast. National Grid operates two HVDC projects in the UK and has three projects under construction. In the U.S., it has extensive experience in developing, managing and operating large and complex electric transmission projects and will manage all aspects of the financing, construction and operation of the Granite State Power Link. Figure 11.4.2 identifies those key people who will be responsible for the Granite State Power Link. Their resumes follow the figure.

National Grid Management Team Granite State Power Link

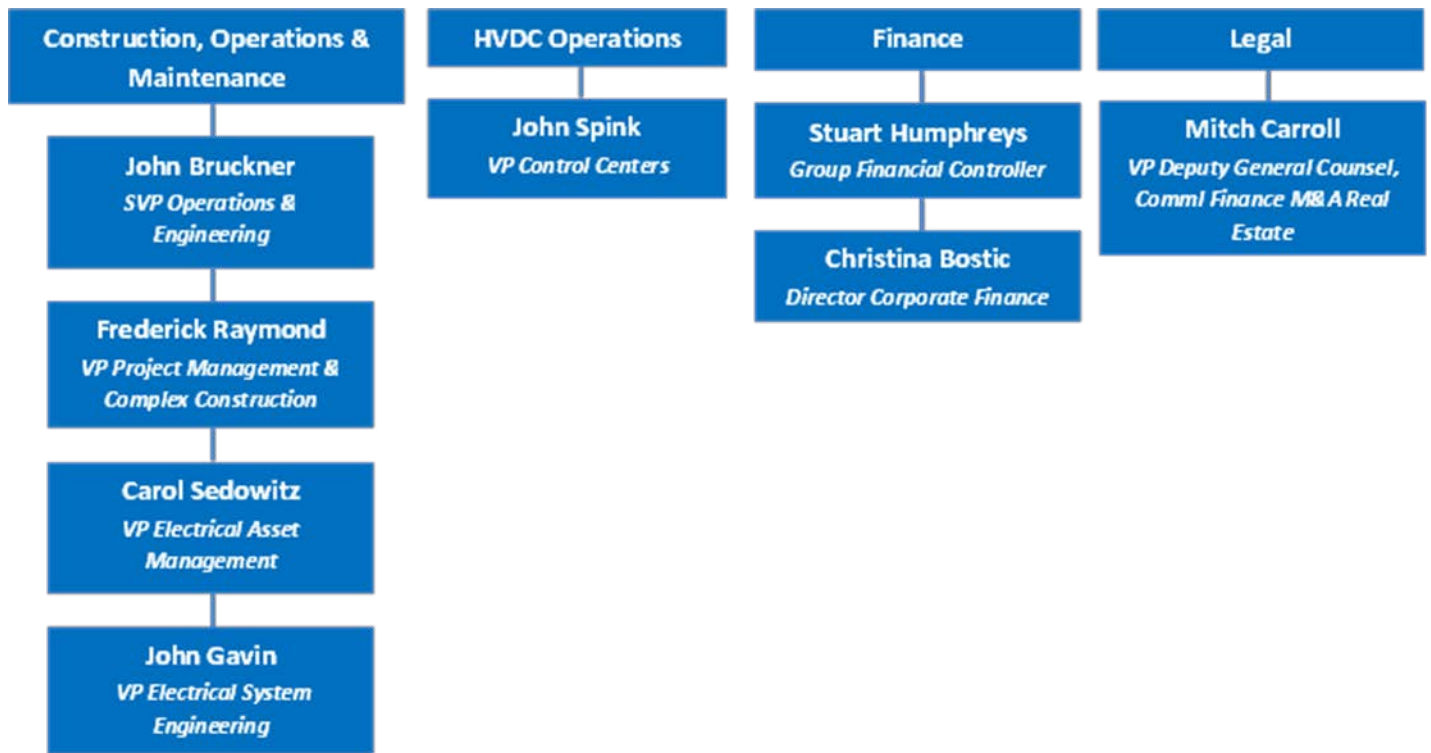


Figure 11.4.2 GSPL Project Financing, Construction, and Operations Phase Organization Chart

John Bruckner – Senior Vice President, Operations and Engineering



With more than four decades of experience, John Bruckner oversees all aspects of maintenance, operations and construction of National Grid's electric distribution system, as well as project management for National Grid's transmission and distribution networks. Previously, he managed the electric transmission and distribution network on Long Island for National Grid under the terms of a Master Services Agreement with the Long Island Power Authority ("LIPA"). Mr. Bruckner oversaw Long Island electric transmission and distribution operations including network strategy planning and engineering, and IT functions that serviced LIPA's electric system. Throughout his career at National Grid and its legacy companies he has held many positions of responsibility in the areas of operations, electric design and construction and transmission and distribution project management. John is a graduate of the U.S. Merchant Marine Academy and has an MBA from New York Institute of Technology.

Fred Raymond, Vice President, Project Management and Complex Construction



With 30 years of experience in the electric energy industry, Fred Raymond oversees transmission, distribution, substation and civil construction, transmission and distribution maintenance, contracts and complex project management. He is responsible for the creation, delivery, management and governance of a fully integrated, consistent process that is used to manage significant construction projects from end-to-end; leads a team that includes several hundred employees and 40+ vendors and managing a multimillion dollar portfolio that includes projects ranging from \$1 million to \$500 million. Raymond has a B.S. in electronic Engineering from Wentworth Institute of Technology and a Certificate of Industrial Engineering from Worcester Polytechnic

Institute.

Carol Sedewitz - Vice President of Electric Asset Management



Carol Sedewitz is Vice President of Electric Asset Management for the Regulated Businesses at National Grid in the United States. The electric asset management function includes electric transmission and distribution planning and asset management, electric reliability analytics, vegetation management strategy, and retail connections engineering. She previously served as the director of network strategy for the federal regulated businesses, director of electric transmission planning in New England and New York and has held other leadership roles at National Grid USA in engineering and systems and business processes. In her years in the electric utility industry, Carol gained extensive experience in various technical, process, policy and regulatory issues, including serving as the Investor Owned Utility

(IOU) sector representative on the North American Electric Reliability Corporation (NERC) Standards Committee from 2010 to 2013.

John Gavin – Vice President, Electric System Engineering



John Gavin has more than 30 years of energy utility expertise. He is responsible for transmission and distribution system capacity planning and asset management capabilities, system performance, and the development, filing, and execution of rate case plans in each of the states where National Grid operates. Previously as Director, Substation Engineering, he oversaw the engineering and design of transmission and distribution substations in upstate New York and New England, and managed an annual project portfolio of approximately \$350M. He has also held positions of responsibility in National Grid's Asset Strategy, Substation O&M Services, Overhead/ Underground Lines and Electric Operations departments. Gavin holds

an MBA from Assumption College and a B.S. in Marine Engineering from Massachusetts Maritime Academy. He also completed a Certificate program in Electrical Technology at the Northeast Institute of Technology.

John Spink – Vice President, Control Center Operations



John Spink's career at National Grid and its predecessor companies spans 33 years. He oversees all of National Grid's U.S. electricity and gas control centers and is responsible for the operation of the U.S. portion of a 450kV HVDC interconnector that runs from northern Canada to central Massachusetts in which National Grid has a majority ownership interest. He currently is managing a major upgrade of the control and protection system at National Grid's Sandy Pond substation, which is the southern terminus of the HVDC system. He also oversees the Meter Data Services team, which collects meter data and ensures it can be passed to the billing system and to the wholesale settlement to the ISO. He has an MBA from Lemoyne College and a B.S. in Engineering from Clarkson University.

Stuart Humphreys – Group Financial Controller



Mr. Stuart C. Humphreys has been Group Financial Controller at National Grid Electricity Transmission PLC since June 2013. Mr. Humphreys served as UK Chief Finance Officer at National Grid Electricity Transmission PLC and served as its Finance Director of Transmission since July 2008. Mr. Humphreys served as UK Finance Director at National Grid Gas Plc until May 31, 2013. He has been a Director at NGG Finance PLC since June 01, 2013. He served as Director of National Grid Electricity Transmission PLC from July 2008 to May 31, 2013. Mr. Humphreys served as a Director at National Grid Gas Plc from July 2008 to May 31, 2013.

Christina Bostic – Director Corporate Finance



Ms. Christina Bostic has been the Director of Long Term Planning at National Grid since June 2016. Ms. Bostic was with Brookfield Renewable as Director of Finance for over 4 years where she managed an asset based loan portfolio of approximately \$7 billion for the North American Platform. From 2007 to 2012 Ms. Bostic was the Director of Finance and Treasury at Brookfield Renewable with overall responsibility for corporate finance, treasury, cash management, liquidity and external investments. Ms. Bostic has a MBA from Villanova University and a BS in Entrepreneurial Studies and Economics from Babson College.

Mitch Carroll - Vice President Deputy General Counsel, Commercial Finance M&A Real Estate



Mr. Mitch Carroll joined National Grid as Vice President Deputy General Counsel in September 2016. Mr. Carroll is a commercially-oriented attorney with 20+ years of private practice and in-house experience within the energy sector. Mr. Carroll holds deep expertise in debt and equity finance, mergers & acquisitions, corporate governance and commercial matters. He also has extensive experience in development,

construction, financing, acquisition, disposition and restructuring of energy and infrastructure projects. Mr. Carroll has a LL.M. from Boston University School of Law, a J.D. from New England Law, and a BA in Economics from Boston College.

RES Canada Wind Portfolio

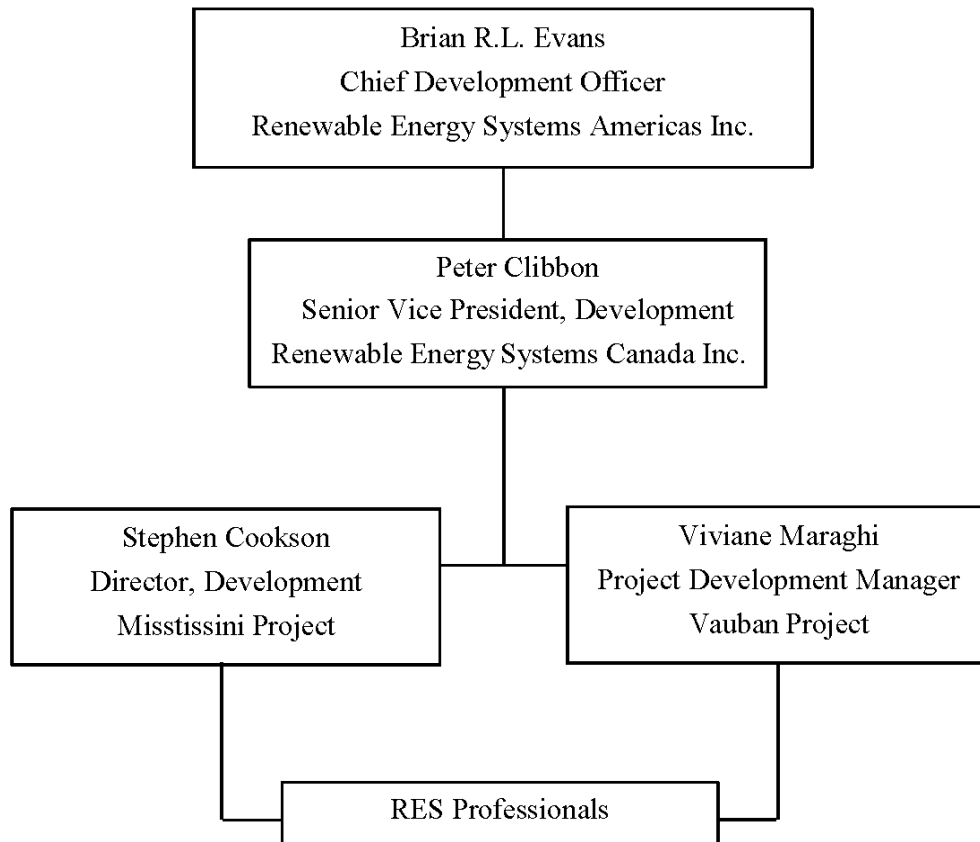


Figure 11.4.3 RES - Development Phase Organization Chart

Brian R.L. Evans – Chief Development Officer, Renewable Energy Systems Americas Inc.

Brian Evan has worked with RES' parent company, Sir Robert McAlpine Enterprises Ltd., since 1994. He constructed two wind farms in Ireland before becoming RES Americas' first employee in the U.S. in 1998. He is responsible for RES' development portfolio in the U.S. and Canada, and serves as President of RES America Developments.

Peter Clibbon – Senior Vice President, Development, Renewable Energy Systems Canada Inc.

Responsible for founding the RES Canada subsidiary, creating a pipeline of wind projects, establishing strategic relationships with partners and presenting opportunities to RES to secure EPC and BOP construction contracts in Canada. Responsible for all stages of project

development across Canada with an active pipeline of over 3,000 MW of projects in 7 provinces. Focus is on development from site origination through to final permitting and Notice To Proceed. Responsibilities include: land rights negotiations and environmental assessment; public consultation and governmental permitting approvals; engaging in municipal consultation and establishment of stakeholder relationships including local landowners, co-ops and local First Nations.

Stephen Cookson – Director, Development, Renewable Energy Systems Canada Inc.

Responsible for development of utility-scale wind energy and transmission line projects. Manages overall development, environmental assessments (EA), land acquisition, permitting, interconnection, and project-level financial screening, as well as agency and stakeholder relationships. Focus on Aboriginal relations and partnerships, including leading the development and EA of the 1,800km, \$1.5B Wataynikaneyap Transmission line project, in partnership with 22 First Nations. Was lead PM and responsible for development of the 100MW Greenwich windfarm project, including public land acquisition, EA permitting, stakeholder engagement, and operations support; secured Impact and Benefits Agreements with local First Nation communities while supporting the development of RES' Ontario (Crown land portfolio). Was lead PM and responsible for the development of the 150MW Massif du Sud windfarm in Quebec, including private land acquisition, EA permitting, stakeholder engagement and financial close; secured BAPE commission approval, while supporting the development RES' Quebec portfolio.

Viviane Maraghi – Development Manager, Renewable Energy Systems Canada Inc.

Viviane Maraghi has nearly 12 years of experience as a wind project development manager. She began her career at Hélimax and soon joined the TransCanada Energy team where she supported the development of over 2,000 MW of wind projects in various markets. She joined the RES Canada team in April 2014 and is now the Development Manager of the Mont Sainte-Marguerite Wind Farm which has a 25 years contract with Hydro-Québec Distribution and is scheduled to enter into commercial operation in December 2017. Viviane has always been very active in various associations of the industry and is part of the AQPER board and the Canwea Quebec Steering committee.

RES Professionals

RES Group is a fully integrated renewable energy company having in-house resources allowing the company to manage all aspects of development, construction, financing, operations and maintenance. The Key Personnel individually have extensive experience and involvement in the development, engineering, construction, and operation of wind farm projects. Figure 11.4.3 identifies those key people who will be responsible for the RES Wind Project Portfolio. Full resumes can be found attached hereto as *Attachment 11.4.1 - Key RES Personnel CVs*.

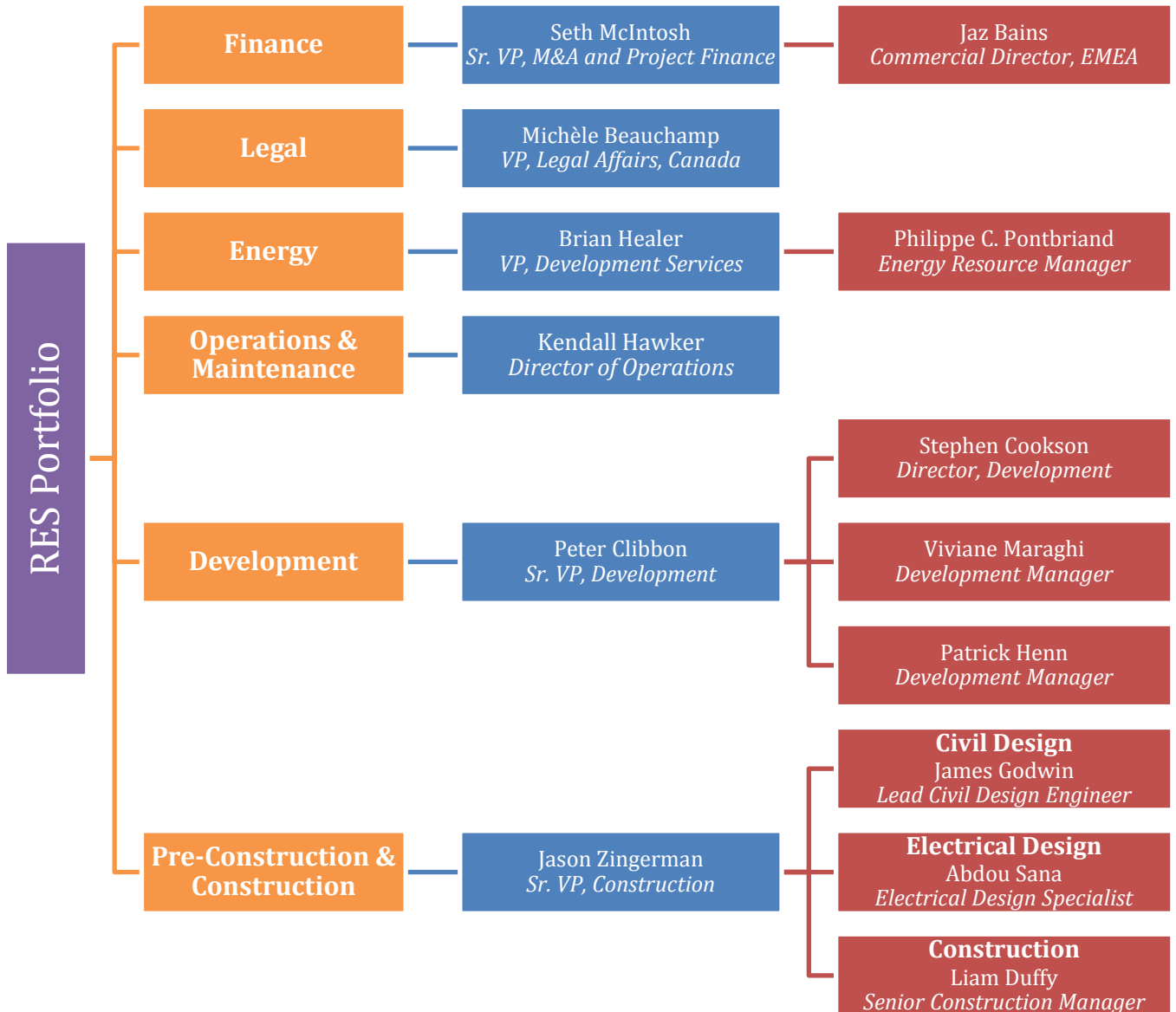


Figure 11.4.4 RES Financing, Construction, and Operations Organization Chart

Key personnel respective curriculum vitae are attached hereto as *Attachment 11.4.1 – Key RES Personnel CVs*.

11.5 Provide a listing of all projects the project sponsor has successfully developed or that are currently under construction. Provide the following information as part of the response:

- i. Name of the project

- ii. Location of the project
- iii. Project type, size and technology
- iv. Commercial operation date
- v. Estimated and actual capacity factor of the project for the past three years
- vi. Availability factor of the project for the past three years
- vii. References, including the names and current addresses and telephone numbers of individuals to contact for each reference

GSPL Project

Please refer to *Attachment 11.5 (confidential) - National Grid USA Transmission Projects*.

RES Canada Wind Portfolio

A list of all the projects developed, constructed, and operated by RES Canada or its affiliates is included as *Attachment 11.2 – RES Project Experience List*.

The data for the estimated and actual capacity factor and availability factor of the projects for the past three years are not available due to the requirement to obtain disclosure from financing partners. Upon request, RES Canada shall seek such approval.

- 11.6 With regard to the bidder's project team, identify and describe the entity responsible for the following, as applicable:
- i. Construction Period Lender, if any
 - ii. Operating Period Lender and/or Tax Equity Provider, as applicable
 - iii. Financial Advisor
 - iv. Environmental Consultant
 - v. Facility Operator and Manager
 - vi. Owner's Engineer
 - vii. EPC Contractor (if selected)
 - viii. Transmission Consultant
 - ix. Legal Counsel

11.6.i. Construction Period Lender, if any

GSPL Project

NGUSA will likely finance the project on its balance sheet, in which case there would be no outside lenders. Some of NGUSA's more recent experience constructing and financing transmission projects are listed below:

New England East West Solution (NEEWS) – National Grid constructed the ***Rhode Island Reliability Project (RIRP) and the Interstate Reliability Project (IRP)***. The NEEWS suite of projects for National Grid totaled \$750 million. National Grid collaborated with Eversource Energy to construct the IRP, a three-state transmission project that involved, among other things, the siting and construction of a new overhead 345kV transmission line in Massachusetts, Rhode Island and Connecticut. National Grid financed and constructed the Massachusetts portion of the line, which was estimated to cost \$100 million with internal money pool financing. The RIRP project involved installing a new 345kV transmission line in Rhode Island on an existing right-of-way and moving and rebuilding two 115kV lines in order to make room for the new 345kV line, relocating a 345kV line in the state, and major substation additions at three Rhode Island substations. The Advanced NEEWS projects include a rebuild and reconductoring of a 115kV line and installation of a new 345/115kV switching substation in Southeastern Massachusetts. The last sections of the project were placed into service in December 2015.

Merrimack Valley / North Shore Upgrade Area Project – The project was completed between 2010 and 2013 involving \$174 million of capital projects constructed by National Grid. The project included the construction of a new 345/115kV gas-insulated substation at Wakefield, Massachusetts, a new 345/115kV substation in West Amesbury Massachusetts, building of a new 115kV line (K-163), as well as reconductoring of multiple 115kV lines and upgrades at other area substations in Northeastern Massachusetts.

Auburn Street Area Projects – These projects in Massachusetts were completed in 2012 and involved \$98 million of capital projects constructed by National Grid. The projects included a complete rebuild of the 115kV and 345kV yards and addition of 345 / 115kV transformation at Auburn Street substation, as well as significant 115kV substation work at to other area substations.

Greater Boston and Southern New Hampshire Solution – National Grid is in the process of permitting and constructing a suite of projects at a total estimated cost \$190 million. The projects include the Merrimack Valley Reliability Project (MVRP) which is a new 345kV line project connecting southern New Hampshire to Massachusetts. National Grid's portion of the MVRP project is estimated at \$87 million. This project is also being constructed collaboratively with Eversource Energy, where Eversource is constructing a portion of the line in New Hampshire. In addition to the MVRP project there are many other 115kV line reconductoring and substation projects associated with this suite of work. All of the projects are expected to be in-service in 2018.

Salem Cable Rebuild – National Grid is in the process of rebuilding the two 115kV cables in the City of Salem, Massachusetts. The project involves engineering, siting and constructing a complex cable system in the historic downtown section of the city. The project's cost is estimated at \$63 million, and construction is expected to be complete in 2017.

Sandy Pond – National Grid owns and operates a high voltage direct current (HVDC)

transmission line rated at $\pm 450\text{kV}$ that is a key section of an interconnector between New England and Canada. National Grid operates the New England portion of the interconnection known as Phase 2 between New England and Canada. Phase 2 includes HVDC transmission lines from La Grande Station, James Bay, Quebec to Des Cantons and from Monroe, New Hampshire to Sandy Pond Station in Massachusetts, and three converter terminals (Radisson, Nicolet, and Sandy Pond), which were placed in service in the early 1990s. Sandy Pond is a $\pm 2,000\text{ MW}$ $\pm 450\text{kV}$ DC bipolar converter terminal. This interconnection system from Quebec to Sandy Pond station in Massachusetts is the only large-scale multi-terminal HVDC system in the world today. The project cost \$230 million.

Sea2Shore - This is an undersea transmission cable connecting the first off-shore wind farm in the US to Block Island, Rhode Island and connecting into the National Grid's transmission network in Narragansett Rhode Island. The project cost was approximately \$110 million and went into service in 2016.

RES Canada Wind Portfolio

The Construction Period Lender for the Mistissini and Vauban projects has not yet been identified.

11.6.ii. Operating Period Lender and/or Tax Equity Provider, as applicable

GSPL Project

NGUSA will likely finance the project on its balance sheet, in which case there would be no outside lenders.

RES Canada Wind Portfolio

The Operating Period Lender for the Mistissini and Vauban projects has not yet been identified and no Tax Equity Provider is anticipated.

11.6.iii. Financial Advisor

GSPL Project

NGUSA intends to use internal expertise and resources for the Granite State Power Link project as was shown in Section 11.6.i above.

RES Canada Wind Portfolio

Financial counsel will be sourced from internal expertise and resources for the Mistissini and Vauban projects.

11.6.iv. Environmental Consultant

GSPL Project

Tetra Tech is the GSPL Project's lead environmental consultant. Tetra Tech is one of the leading engineering and environmental consulting firms in the world with over 16,000 staff in more than 400 offices worldwide. Tetra Tech produces hundreds of environmental permitting and compliance documents annually, and offers more than 30 years of experience working with federal and state regulatory agencies and processes for developing energy facilities, including overhead high voltage electric transmission lines. Tetra Tech staff were previously involved in the siting and permitting of the HQT Phase I and Phase II +/- 450kV DC Transmission Line Project. Tetra Tech staff also has experience with Section 248 proceedings and New Hampshire SEC proceedings for electric transmission lines and substations.

RES Canada Wind Portfolio

The Environmental Consultant has not yet been selected for the Mistissini and Vauban projects. These consultants will be led and managed by the RES Canada Project Managers, who will be sourced from internal resources.

11.6.v. Facility Operator and Manager

GSPL Project

A subsidiary of NGUSA will be the facility operator and manager. National Grid owns and operates an electricity transmission system of approximately 8,600 miles spanning upstate New York, Massachusetts, Rhode Island, New Hampshire and Vermont to customers that include local electric companies, municipalities and large commercial enterprises. NGUSA's electricity transmission facilities operate at voltages ranging from 69kV to 345kV, utilizing overhead lines, nearly 90 miles of underground cable and 524 substations. NGUSA is the largest electricity transmission service provider in New England and New York by reference to the length of these high voltage transmission lines. National Grid also owns and operates a direct current transmission line rated at 450kV that is a key section of an interconnector between New England and Canada.

RES Canada Wind Portfolio

RES Canada will provide operating and managerial services sourced from internal resources to the Mistissini and Vauban generating facilities once operational. RES Canada has operated windfarm projects in Canada, including the 99MW Talbot and Greenwich windfarms. RES Americas also has significant operational experience, operating two windfarm projects in Texas. In general, RES Canada works with long-term owner-operator partners and established service providers to operate its facilities.

11.6.vi. Owner's Engineer

GSPL Project

PSC Consulting LLC (PSC) is the GSPL Project's owner's engineer. PSC is a world leader

delivering advanced HVDC systems, and has been involved in over half of all world-wide HVDC-VSC projects. PSC worked on the very first commercial HVDC VSC project, Gotland, in 1999, and has since supported VSC projects from two of the three major HVDC suppliers for both land and offshore converter stations. PSC's team of HVDC specialists offers extensive expertise in the planning, specification, design, project management, installation, commissioning, operation and maintenance of HVDC transmission systems. PSC can cover all aspects of an HVDC VSC project, including the AC grid interfaces, high voltage AC or HVDC cable systems, high voltage converter station equipment, control systems, auxiliary power systems, protection systems, telecommunications and operator control interface.

RES Canada Wind Portfolio

The Owner's Engineer has not yet been identified for the Mistissini and Vauban projects.

11.6.vii. EPC Contractor (if selected)

GSPL Project

GridAmerica has worked with General Electric throughout the development phase of the GSPL Project, but a final decision on EPC contractors and structure will be made in 2018.

RES Canada Wind Portfolio

The EPC Contractor has not yet been identified for the Mistissini and Vauban projects.

11.6.viii. Transmission Consultant

GSPL Project

PSC (see above) and Energy Initiatives Group (EIG) are providing transmission analysis and consulting for the GSPL Project. EIG is a leading engineering and analysis group with in depth knowledge of power and transmission markets in New England the rest of the Northeast U.S. They are a recognized industry leader in the area of system analysis and bulk power system reliability including fields of work in transmission planning, protection and control engineering, HVDC transmission, and development of independent transmission projects.

RES Canada Wind Portfolio

RES Canada will source transmission planning services through internal expertise and external resources which are yet to be identified for the Mistissini and Vauban projects.

11.6.ix. Legal Counsel

GSPL Project

Orr & Reno, P.A. of Concord, New Hampshire is providing counsel to the GSPL Project in real

estate and permitting matters in the State of New Hampshire. Orr & Reno has been providing legal counsel over 70 years, since 1946. For Vermont, real estate counsel Dinse, Knapp and McAndrew, P.C. and Murphy, Sullivan & Kronk (MSK), both of Burlington, Vermont, are supporting the GSPL Project. MSK is also supporting the GSPL Project on permitting matters. Anderson & Kreiger LLP of Boston, Massachusetts, is supporting the GSPL Project on items related to the Presidential Permit and NEPA Review process. Anderson Kreiger has one of the leading environmental practices in New England, with nationally recognized practitioners and deep experience in environmental, permitting, and compliance matters.

RES Canada Wind Portfolio

RES Canada will source legal counsel from internal resources for the Mistissini and Vauban projects.

- 11.7 Provide details of the bidder's experience in ISO-NE other Markets affected by the bid. With regard to bidder's experience with ISO-NE markets, please indicate the entity that will assume the duties of Lead Market Participant for your Project. Please provide a summary of the proposed Lead Market Participant's experience with each of the ISO-NE markets.

GSPL Project

As mentioned in above in Section 11.6.v., National Grid, collectively with its subsidiaries, is a very experienced utility and transmission owner in the northeast. While a Lead Market Participant is typically associated with generation assets or other assets that are involved with ISO-NE's wholesale markets, to the extent that the GSPL Project is required to assign a Lead Market Participant, GridAmerica or one of its subsidiaries, will fill this role. GridAmerica is a New England Power Pool (NEPOOL) Participant in the Transmission Sector.

RES Canada Wind Portfolio

RES Canada has limited experience in the ISO-NE Market. Should the RES Canada generation projects be retained, RES Canada or one of its affiliates will coordinate an adequate resource to represent it as a Lead Market Participant working closely with GridAmerica.

SECTION 12 OF APPENDIX B TO THE RFP EMISSIONS

- 12.1 For existing generation facilities, provide emissions estimates based on available continuous emissions monitoring data. Where continuous emissions monitoring data is not available, provide emissions estimates based on the most recent stack emissions test conducted using an EPA reference method approved by the applicable permitting and enforcement authority. Where continuous emissions data or actual stack emissions test data are not available, provide emissions estimates based on emissions factors from the latest edition of EPA's AP-42, Compilation of Air Pollutant Emissions Factors.

For new generation facilities, provide emissions estimates based on available data from the unit manufacturer. Alternatively, provide actual emissions data determined in accordance with the paragraph above for a similar facility built within the past 3 years. Include copies of supporting documentation for all emissions estimates.

As the Mistissini and Vauban projects are new Class I RPS eligible resources, this section is not applicable.

Project Anticipated Emissions, expressed in pounds/megawatt-hour (lbs/MWh)

Source of Information	Date of Test (if applicable)	Greenhouse Gases (all except methane) Expressed as Carbon Dioxide equivalent (CO ₂ e)	Nitrogen Oxides (NO _x)	Sulfur Oxides (SO _x)	Carbon Monoxide (CO)	Particulate Matter (PM 2.5)	Methane (CH ₄)
	N/A						

- 12.2 Describe any past investments that will, or have been made to your facility to improve its emissions profile or any planned future investments made to your facility in order to improve its emissions profile. Pollutant specific emissions improving technologies include, but are not limited to:

- NO_x – Selective/Non-Selective Catalytic Reduction
- SO_x – wet/dry scrubbers
- PM – fabric filter/bag house, electrostatic precipitator, cyclone separator
- CO – oxidation catalyst

Investments that improve overall emissions include, but are not limited to:

- equipment tune-ups (improves combustion efficiency and emissions)
- boiler tube replacements (improves heat transfer efficiency and reduces fuel use)

- other efficiency improvements (e.g., installing a heat exchanger to use waste heat to pre-heat feed water to the boiler)

Include control equipment specifications, date(s) of installation, expected life of equipment, benefits gained from the addition of such equipment, etc.

As the Mistissini and Vauban projects are new Class I RPS eligible resources, this section is not applicable.

- 12.3 Describe how your project will contribute to the Massachusetts 2008 Global Warming Solutions Act (GWSA) and the 2010 Clean Energy and Climate Plan for 2020. Describe how your project will contribute both to the short term 2020 goal, and longer term 2050 goal found in these laws.

As described in Section 2, the GSPL Project and the RES Canada Wind Portfolio present a unique offering because they align environmental and consumer interests in a project that will enhance the Commonwealth's ability to meet its goals under the Global Warming Solutions Act. By substituting non-emitting wind energy generation for the current and forecasted supply mix, Massachusetts will take significant steps to meet its short term and long term emissions reduction goals.

The GWSA requires reductions in greenhouse gas (GHG) emissions from each sector of the economy summing to a total reduction of 25% below the 1990 baseline emission level in 2020 and at least an 80% reduction in 2050. While the Clean Energy Generation from the RES Canada Wind Portfolio will not affect the 2020 goals, the potential effect on the 2050 goals is significant.

According to ISO-NE, the region's dependency on natural gas-fired generation was 15% in 2000, increasing to 49% in 2015. Taken together with rising gas LDC demand, these worrying trends have created a winter season security of supply risk, particularly during polar vortex events. Dependency of gas-fired generation is only expected to increase further. The RES Canada Wind Portfolio will deliver to the region a new, large-scale source of clean, REC-qualified energy whose supply profile offers significant deliveries during critical winter periods.

**SECTION 13 OF APPENDIX B TO THE RFP
CONTRIBUTION TO EMPLOYMENT AND ECONOMIC DEVELOPMENT AND
OTHER DIRECT AND INDIRECT BENEFITS**

- 13.1 Please provide an estimate of the number of jobs to be created directly during project development and construction (for a project that includes new facilities or capital investment), and during operations, and a general description of the types of jobs created, estimated annual compensation, the employer(s) for such jobs, and the location. Please treat the development, construction, and operation periods separately in your response.

GSPL Project Development and Construction

The Granite State Power Link project (GSPL Project) will create jobs in construction, engineering, and professional services, as well as secondary jobs in government, retail, and the local service sector as workers spend their income. GridAmerica prepared a study using software provided by Regional Economic Models, Incorporated (REMI) to estimate the economic impact of the GSPL Project development and construction. REMI is a dynamic equilibrium model of the New Hampshire and Vermont state economies based on public data and peer-reviewed methodology.

Projected spending associated with the GSPL Project was input into REMI to produce estimates of direct, indirect and total number of jobs, as well as compensation levels and the impact of the project on state economic indicators. The results of this study are provided in *Attachment 13.1 (confidential) - GSPL-REMI Report*. Table 13.1.1 below summarizes impact on employment, state GDP, personal income and state tax revenues. In total, the GSPL Project is expected to create 1,060 job years in Vermont and 2,523 job years in New Hampshire (a “job year” is defined as one job for a period of one year). Project development jobs occur mainly during 2017 – 2019 but can continue throughout project construction as issues arise. Construction jobs are in reflected primarily in 2020 – 2023 data.

Table 13.1.1 GSPL Project Economic Impacts by State

Calendar Year	2017	2018	2019	2020	2021	2022	2023	Sum
Vermont								
Employment (Jobs)	3	6	20	87	608	286	49	1,060
Gross Domestic Product (\$2017m)	\$0.3	\$0.6	\$1.8	\$8.5	\$50.2	\$23.4	\$3.7	\$88.5
Personal Income (\$2017m)	\$0.1	\$0.3	\$1.0	\$4.3	\$30.8	\$16.4	\$5.2	\$58.1
State Tax Revenue (\$2017m)	\$0.0	\$0.0	\$0.1	\$0.5	\$3.2	\$1.7	\$0.5	\$6.1
New Hampshire								
Employment (Jobs)	5	10	35	255	1,497	604	117	2,523
Gross Domestic Product (\$2017m)	\$0.5	\$1.0	\$3.7	\$28.2	\$157.0	\$61.1	\$10.4	\$261.9
Personal Income (\$2017m)	\$0.3	\$0.6	\$2.1	\$13.6	\$89.6	\$40.1	\$13.4	\$159.8
State Tax Revenue (\$2017m)	\$0.0	\$0.0	\$0.1	\$0.5	\$3.2	\$1.4	\$0.5	\$5.8

Table 13.1.2 shows estimated job creation by industry for each state. Most local job creation is in the construction industry, but a wide variety of other industries are impacted, including retail trade, professional services, local materials manufacturing and other services.

Table 13.1.2 GSPL Project Construction -Total Job Years Created by Industry (2017-2023)

	Vermont	New Hampshire
Construction	534	1,275
Manufacturing	50	153
Wholesale Trade	9	33
Retail Trade	76	206
Transportation and Warehousing	7	19
Finance, Insurance, Real Estate	114	183
Professional Services	63	137
Administrative and Waste Management Services	22	62
Accommodation and Food Services	31	77
Government and Other Services	134	299
Mining and Utilities	21	80
Total	1,060	2,523

The jobs data shown in Tables 13.1.1 and 13.1.2 are totals that include both direct and indirect job years. Direct jobs are tied directly to the GSPL Project development and construction. Examples include consultants and electrical contractors hired to plan and construct the GSPL Project. Indirect jobs are from the local supply chain, that is, industries providing goods and services for the project. Examples include equipment rental (which is part of the retail trade industry) and general construction activities such as right-of-way clearing and preparation. Indirect jobs also include “induced” jobs, which result from the spending of the direct and indirect workers. These employment impacts are felt mainly in local service sectors such as retail. Table 13.1.3 shows the breakdown direct and indirect job years for each state, as estimated by REMI. Direct job years account for 54% of total job years (average for the two states). For construction, direct job years account for 78% of total construction job years.

Table 13.1.3 GSPL Project Development and Construction – Number of Direct and Indirect Job Years

	Vermont			New Hampshire		
Job Years (2017-2023)	Direct	Indirect	Total	Direct	Indirect	Total
Construction	411	123	534	997	278	1,275
Manufacturing	36	15	50	114	39	153
Wholesale Trade	0	9	9	0	33	33
Retail Trade	0	76	76	0	206	206
Transportation and Warehousing	0	7	7	0	19	19
Finance, Insurance, Real Estate	93	21	114	118	65	183
Professional Services	30	33	63	39	98	137
Administrative and Waste Management Services	7	15	22	17	45	62
Accommodation and Food Services	0	31	31	0	77	77
Other Services	0	134	134	0	299	299
Mining and Utilities	11	9	21	58	22	80
Total	588	473	1,060	1,342	1,181	2,523

Professional services and finance, insurance and real estate also see a significant number of direct job years. This includes labor for project engineering and design, legal counsel, management services, public relations, real estate, permitting, environmental and geophysical surveys and analysis, property rights acquisition and electrical systems studies. Local manufacturing, which includes industries that provide local materials for the project such as wood matting, gravel and concrete, is also expected to see a significant number of direct jobs.

Estimated annual compensation per job year, by industry, is shown below in Table 13.1.4 for each state. These compensation rates apply to both the direct and indirect job years shown above. Compensation is measured as total earnings, which includes wages and salaries, benefits, supplements to wages and salaries, and proprietor's income.

Table 13.1.4 GSPL Project Development and Construction – Estimated Annual Compensation of Job Years

Avg Annual Earnings Per Job Year (2017-2023)	Vermont	New Hampshire
Construction	\$66,004	\$80,126
Manufacturing	\$74,749	\$87,401
Wholesale Trade	\$122,207	\$172,060
Retail Trade	\$51,685	\$56,889
Transportation and Warehousing	\$82,246	\$79,692
Finance, Insurance, Real Estate	\$68,976	\$95,191
Professional Services	\$84,292	\$124,390
Administrative and Waste Management Services	\$59,496	\$77,793
Accommodation and Food Services	\$44,486	\$41,478
Other Services	\$40,092	\$51,795
Mining and Utilities	\$62,829	\$47,988
Average	\$63,265	\$109,532

All job numbers shown in the above tables are for industries located in the states shown. The REMI model did not include estimates below the state level. Also, all results shown are for development and construction of the GSPL Project.

Mistissini Project Development and Construction

Approximately 250 jobs will be created in the province of Quebec during the peak construction period associated with the Mistissini Project. The level of compensation associated with these positions has not yet been determined, but the jobs are generally skilled trades, as detailed in Section 10, the construction period for the Mistissini Project is estimated to be on the order of 18 months.

RES Canada will consider the procurement of project components from the Commonwealth as a priority and will undertake discussions with US and Massachusetts suppliers wherever possible. This said, the local labour component of the construction period will likely be from the Quebec labour pool, given local requirements.

Vauban Project Development and Construction

Approximately 300 jobs will be created in the province of Quebec during the peak construction period associated with the Vauban Project. The level of compensation associated with these positions has not yet been determined, but the jobs are generally skilled trades. As detailed in Section 10, the construction period for the Vauban Project is estimated to be on the order of 18 months.

RES Canada will consider the procurement of project components from the Commonwealth as a priority and will undertake discussions with US and Massachusetts suppliers wherever possible. This said, the local labour component of the construction period will likely be from the Quebec labour pool, given local requirements.

GSPL Project Operations

After the GSPL Project is placed into service, it is expected to bring several permanent benefits to New Hampshire, including: increased property tax revenues to affected communities; operation of a transfer station with permanent FTE's; new transmission line O&M; lower market electricity costs; and reduced emissions from generation. However, the economic impact of these permanent benefits has not been estimated in REMI.

Mistissini Project Operations

During project operations and over the life of the term, approximately 10-12 full-time and permanent jobs will be created in the Province of Quebec.

Vauban Project Operations

During project operations and over the life of the term, approximately 12-15 full-time and permanent jobs will be created in the Province of Quebec.

- 13.2 Please provide the same information as provided in response to question 13.1 above but with respect to jobs that would be indirectly created as a result of the proposed project.

GSPL Project

Table 13.1.3 above shows the estimated number of job years that will be indirectly created as a result of the GSPL Project development and construction. These job years would be compensated at the same rate as the direct job years. Compensation rates for both direct and indirect job years, by industry, are shown in Table 13.1.4.

RES Canada Wind Portfolio

This information is not yet available for the Mistissini and Vauban projects and will need to be fully evaluated during the latter stages of the development process, once a refined list of local and regional services has been created.

- 13.3 Please describe any other economic development impacts (either positive or negative) that could result from the proposed project, such as creating property tax revenues or purchasing capital equipment, materials or services for New England businesses. Please provide the location(s) where these economic development benefits are expected to occur.

GSPL Project

In addition to typical economic development created from a large transmission project (direct and indirect jobs), the Granite State Power Link is partnering with established local and regional economic development organizations along the route to implement community and economic development grant and loan programs that support local job creation and expand business opportunities. Additionally, each town along the project route will receive significant property tax revenue that could result in local government-stimulated economic development.

GridAmerica contracted with ESAI Power LLC (ESAI) to assess the consumer and air emission benefits associated with the GSPL Project. ESAI determined that the lower energy price profile that results from additional price-taking energy provided to the system through the GSPL Project lowers costs to consumers by a net present value of \$1.2 billion over the project life. Other benefits identified by ESAI include natural gas offsets, regional reliability and capacity benefits, and carbon reductions, which, despite uncertainty regarding the Clean Power Plan, remain a priority under the Regional Greenhouse Gas Initiative (RGGI). Please see *Attachment 13.3 (confidential) - ESAI GSPL Report 2017* for complete findings.

RES Canada Wind Portfolio

As the Mistissini and Vauban projects are situated outside the Commonwealth, the economic development impacts are somewhat limited. However, as noted above RES Canada will undertake to source project components, where possible, from New England businesses. Even though local construction and economic spinoff activity from the construction of the projects will be generally limited to Quebec, RES Canada believes that the Commonwealth could be proud to know that good quality jobs are being created for First Nation and regional communities, in the larger North American economy, and the highly linked Quebec and New England markets.

- 13.4 To the extent not already specified elsewhere in your response, please address the factors listed in Section 2.2.2.9 and describe any benefits or impacts associated with the proposed project.

GSPL Project

The GSPL Project will bring about energy cost savings of \$7.8 billion across New England within its first ten years of operation (see Attachment 13.3 (confidential)). During that same timeframe, Massachusetts energy consumers will see \$2.4 billion in energy savings, and Vermont and New Hampshire will save \$487 million and \$1.4 billion, respectively. These cost savings will provide additional monies for other expenditures, and could give way to increased personal and business spending, thereby positively impacting the local and regional economies.

RES Canada Wind Portfolio

As detailed above, although the Mistissini and Vauban projects are situated outside the Commonwealth, RES Canada anticipates some economic benefits to Massachusetts and New England.

In addition to this, the projects will have significant benefits to the local First Nation and regional communities where they will be built. RES Canada anticipates some revenue benefits will flow to these communities and has traditionally helped to build capacity, train workers, and foster economic development in its project communities.

13.5 Describe how your project will (a) contribute to reducing winter electricity price spikes in Massachusetts, and (b) guarantee energy delivery in winter months. Class I RPS eligible projects must guarantee that 70% of energy in their delivery profile of the Winter Peak Period will be delivered over the course of every Winter Peak Period (see Section 2.2.2.7). Clean Energy Generation for projects containing firm service hydroelectric generation, and Clean Energy from new Class I RPS eligible resources paired with firm service hydroelectric generation, will be required to submit a delivery profile with no Winter Peak Period hour less than 60 percent (60%) of their highest annual single hourly delivery claimed in their annual delivery profile.

a) contribute to reducing winter electricity price spikes in Massachusetts

If N/A, state

The wind generation projects are well positioned to alleviate the System Peak Loads. The production profiles presented below in Section 4.1 and Appendix F of Attachments *4.1.1 (confidential) – Assessment of the Energy Yield at the Mistissini Wind Farm* and *4.1.2 (confidential) – Assessment of the Energy Yield at the Vauban Wind Farm* demonstrate that a significant portion of the production of the wind farms would occur during the peak price hours as defined by NE-ISO.

b) guarantee energy delivery in the winter months

If N/A, state

RES Canada understands the importance of meeting Energy Delivery requirements during the Winter Peak Periods, as set out in Section 2.2.2.7. RES Canada has retained a third party consultant to conduct a shortfall analysis for the Mistissini and Vauban projects.

[REDACTED]

- 13.6 If applicable, please demonstrate any benefits to low-income ratepayers in the Commonwealth, and the impact, if any, those benefits will have on the cost to the project.

GSPL Project

As described in Section 5.1, Citizens Energy has the option to acquire a 10% economic interest in the GSPL Project. Citizens Energy is working with GridAmerica on several innovative transmission projects in the Northeast to resolve transmission bottlenecks and provide access to affordable renewable energy for ratepayers in the Commonwealth. Citizens will invest its own capital for up to 10% ownership of the GSPL Project and dedicate 50% of its after-tax net profits to create a new assistance program for low-income ratepayers in the region. Importantly, Citizen's involvement in the GSPL Project will *not* impact the cost of the project or have any negative impact on ratepayers – rather, Citizens will earn the same proportionate profits that GridAmerica earns, and use half of those profits to assist low-income ratepayers.

Citizens and the GSPL Project development team are committed to working closely with local stakeholders in the Commonwealth to design, implement, and manage a cost-effective energy assistance program that targets areas of highest need and maximizes the benefits to low-income ratepayers. These programs could be in areas such as heating assistance and residential weatherization, energy conservation, or helping low-income residents reduce their reliance on fossil fuels.

Any estimate of Citizen's project profits available for the assistance program would be extremely preliminary and speculative, as profitability ultimately depends on many variable factors such as timing, pricing, development and construction costs, and cost-of-capital. However, based on the size of investment required and Citizen's previous transmission project experience, initial estimates would be ~\$1.3 million per year for the initial 20-year length of the GSPL Project contract.

Citizens Energy is Boston-based non-profit founded in 1979 by former Congressman Joseph P. Kennedy II, and has a long history of using revenues from successful commercial energy ventures to finance charitable programs to help the economically disadvantaged. Starting in the oil and natural gas industries, Citizens also launched innovative businesses in health care, electricity trading, and energy conservation. More recently, Citizens has been actively engaged in the renewable energy sector – developing and owning electric generation projects and high voltage transmission lines (see Section 5.3). Citizens has successfully developed over 230 MW of wind power, owns and operates 86 MW of solar projects (half located in Massachusetts), and owns a significant portion of the 500 kV \$1.9 billion Sunrise Powerlink transmission line with San Diego Gas & Electric. In every case, Citizens has used profits from its ventures to assist low-income families where it operates.

RES Canada Wind Portfolio

RES Canada anticipates that the low-cost nature of its proposal will directly and immediately benefit the Commonwealth low-income ratepayer by providing low-cost renewable energy as the Massachusetts works to meet its GWSA and climate goals.

**SECTION 14 OF APPENDIX B OF THE RFP
ADDITIONAL INFORMATION REQUIRED FOR TRANSMISSION PROJECTS (AND
ALL SYSTEM UPGRADES ASSOCIATED WITH PROPOSED TRANSMISSION
PROJECTS)**

Bids that include Transmission Projects (and all System Upgrades) must also provide the following information:

14.1 Transmission Project Information:

14.1.i. Overall project description

The Granite State Power Link project (GSPL Project) is a 1200 MW Voltage Source Converter (VSC) HVDC transmission system extending from Quebec to a converter station in Norton, Vermont, near the Vermont and Canadian border, to another converter station in Monroe, New Hampshire. A 58-mile overhead HVDC line will connect the two converter stations. The entire HVDC line will parallel existing transmission lines. Approximately 53 miles of the HVDC line will be in Vermont and 5.8 miles will be in New Hampshire.

In Vermont, the HVDC line will be located in the towns of Norton, Avery's Gorge, Lewis, Ferdinand, Granby, and Victory, and in New Hampshire it will be located in the towns of Littleton and Monroe. VELCO's familiarity with the route and their existing asset, VELCO has strong interest in its potential to perform the engineering and construction of the GSPL Project. Such a contract would entail benefits to Vermont ratepayers and bring VELCO's engineering and construction experience in Vermont to the GSPL Project execution. VELCO and the GSPL Project continue their discussion to more fully develop and define the potential benefits and arrangement.

The point of interconnection of the GSPL Project will be the existing Comerford 230kV substation located in Monroe, New Hampshire. The voltage of the substation and the existing 230kV AC transmission lines from Comerford, New Hampshire to Londonderry, New Hampshire are proposed to be upgraded to 345kV.

14.1.ii. The operating voltage of the proposed project: ±400kV DC

14.1.iii. The type of structures (such as steel towers or poles) that would be used for the proposed project

For the ±400kV HVDC overhead line, tubular steel pole structures and aluminum conductors will be used to provide strength and durability for long-term reliability. To minimize the visual impact, the structures will be manufactured to appear nearly identical to the existing HVDC line structures, and they will be placed next to existing HVDC structures whenever possible. The structures will be made from weathering steel, which will age to a dark brown color, further reducing the visual impact. The line will have two direct-current poles, each comprised of three 2156 kcmil ACSR "Bluebird" conductors. One of the two shield wires will be a 5/8" 19-strand extra-high-strength steel wire, and the second will be fiber optic ground wire (OPGW). The majority of foundations will utilize micropiles, which are well suited to locations with shallow bedrock and reduce the need to expand the existing gravel road network along the length of the

right-of-way to accommodate the remaining foundations will be reinforced concrete raft foundations and reinforced concrete caissons.

To reduce environmental impacts, lower construction costs and increase the efficiency of future maintenance, the new HVDC transmission line will be placed beside an existing +/-450kV HVDC transmission line for its entire length. This existing HVDC line is known as “Phase 1” and was placed in service in the 1980s. The right-of-way in which it is located extends from the U.S. and Canada border in Norton, Vermont to Monroe, New Hampshire. The “Phase 2” +/-450kV HVDC line extends from Monroe, New Hampshire to Ayer, Massachusetts. It was placed in service in 1990. The two converter stations and the AC switching station in Norton, Vermont will both be located very close to the existing right-of-way.

The existing HVDC right-of-way in Vermont is predominantly owned by Vermont Electric Transmission Company (VETCO), a subsidiary of Vermont Electric Power Company (VELCO). For the first 47 miles of the right-of-way, the existing HVDC line is located at the center of the 200 foot wide right-of-way as it crosses through the towns of Avery’s Gore, Averill, Lewis, Bloomfield, Brunswick, Ferdinand, Granby, Victory, Lunenburg, and Concord, Vermont.

From about mile 47 to mile 52, the Phase 1 HVDC line occupies a 335-foot wide right-of-way parallel to a 115kV line owned by Eversource and a 34.5kV owned by New England Power as it crosses from Concord to Waterford, Vermont.

From mile 52 in Waterford, Vermont to mile 53 in Littleton, New Hampshire, the Phase 1 right-of-way is 200 feet wide as it crosses the Connecticut River into New Hampshire where it intersects another New England Power right-of-way. From mile 53 in Littleton, New Hampshire to mile 58 in Monroe, New Hampshire the HVDC line parallels two New England Power 230-kV lines within a 375-foot wide right-of-way. *Attachment 8.1.1 – GSPL DC Line Cross-Section Diagrams* provides detailed cross sections covering the entire 58-mile the GSPL Project route.

14.1 iv. The length of the proposed transmission line and the type(s) of terrain and land ownership of the proposed ROW

Overhead miles: Approximately 58

Underwater/underground miles: N/A

Terrain: see below

The GSPL Project HVDC line is an approximately 58-mile ±400kV direct current transmission line from a new converter station near the U.S./Canada border in Norton, Vermont to a new converter station in Monroe, New Hampshire close to New England Power’s existing Comerford Substation. The proposed HVDC line will be adjacent to the existing Quebec-New England HVDC line on a new 150-foot wide right-of-way. This location adjacent to the existing right-of-way will minimize environmental impacts, reduce construction costs and provide for more efficient maintenance. Figure 6.1.2 located in Section 6.1 presents an overview of the project’s HVDC line corridor in Vermont.

The proposed GSPL Project is located in an area of Vermont known as the Northeast Kingdom, which can be characterized as less densely populated than other parts of the state. The Northeast Kingdom represents 21% of the Vermont land area but contains only 10% of the

state's population. The general level of development along the proposed project route is illustrated by the limited number of roadways that traverse the area. Between the U.S./Canada border and the Connecticut River crossing, the proposed GSPL Project route crosses three major roadways (see *Attachment 6.1.1-6.1.19, Maps*): State Route 114, State Route 105, and U.S. Route 2. State Route 114 is crossed by the Phase I HVDC line right-of-way and the proposed GSPL Project route about 1 mile south of the U.S./Canada border. From that point the Phase I HVDC right-of-way and proposed GSPL Project route continue through undeveloped forest land for approximately 16.5 miles before crossing State Route 105. The next major road crossing at U.S. Route 2 is approximately 24.5 miles south of the State Route 105 crossing. There are no major road crossings for the last 10.4 miles in Vermont between the U.S. Route 2 crossing and the Connecticut River (see *Attachment 6.1.1-6.1.19, Maps*).

South of the Connecticut River crossing, in New Hampshire, the proposed GSPL Project right-of-way crosses State Route 18/135, and then Interstate 93, crossing State 135 again before reaching the proposed converter station site (see *Attachment 6.1.1-6.1.19, Maps*). The area traversed by the GSPL Project right-of-way in New Hampshire is a mix of forest land along the Connecticut River and some agricultural land.

The GSPL Project across Vermont (and including approximately 5.8 miles in New Hampshire) as described above would be 58 miles in length and 150 feet in width, equating to approximately 1,050 acres of land. Figure 6.1.2 below presents an overview of the project HVDC line corridor in New Hampshire.

The project team is actively acquiring land rights (or options to secure such rights), both fee and easement (depending on the parcel and its intended use), for as many as 57 (in VT) and 26 (in NH) parcels owned by private, governmental, utility and not-for-profit landowners, with some variation as to the number of parcels depending upon evolving project requirements. The linear rights to be acquired in Vermont adjoin Vermont Electric Company's existing right-of-way for the entire 53-mile length of the proposed transmission line in Vermont. Presently, VELCO is working with the GSPL Project to bring value to Vermont ratepayers through operating agreements that govern access to the VELCO ROW and information sharing. VELCO sees great short and long-term opportunities from the GSPL Project for Vermont's towns, residents, and businesses, and VELCO looks forward to working with GSPL Project to more fully develop and define these benefits to Vermont ratepayers. The linear rights to be acquired in New Hampshire (approximately 5.8 miles in total) adjoin New England Power Company's existing right-of-way.

14.1.v. The substation facilities (number of breakers, transformers, etc.) required at each terminal of the proposed project and information as to how the new facilities would interconnect to any existing facilities.

New Norton 315kV AC Substation

The Norton AC substation will be a green-field construction site in Norton Township, which is in Essex County, Vermont. It will be east of the existing Phase 2 HDVC transmission line right of way, south of the Canadian border and north of the east-west flowing stream that feeds into Great Averill Pond. The new AC line from HQT will run alongside the HVDC line, expanding the right of way eastward.

Major equipment items for the AC substation;

- One single circuit breaker
- Two disconnectors

New Norton HVDC Converter Station

The Norton HVDC Converter Station will be on the same property as the Norton 315kV Substation. It will be comprised of a GE Grid Solutions HVDC MaxSine™ HVDC system. This will convert the incoming AC power to +/- 400kV DC for transmission south to the Monroe HVDC Converter Station. This system is based on a voltage source converter which mitigates the need for reactive or harmonic control elements, as is traditional for line-commutated-converter HVDC systems. The converter at Norton will be used in the rectifier mode, strictly converting AC to DC, with power flow North to South.

Major equipment items for the HVDC Converter Transformer;

- HVAC Main Equipment Items;
 - Three single phase reactors
 - Three single phase power transformers
- Valve Hall
 - Valves & associated cooling equipment
- HVDC Switchyard Main Equipment;
 - Two resistors
 - Fast cable discharge switch
 - Two phase smoothing reactors
- Protection and Control Equipment

New Monroe HVDC Converter Station

The Monroe Converter Station will be a green-field construction site, to the east of the Comerford Dam and the existing Comerford 230kV Substation. The +/- 400kV DC power from Norton will be converted to 345kVAC by a complementary HVDC Maxsine™ converter that will be used in the inverter mode, strictly converter DC to AC. The converter's output will be connected to the adjacent Comerford 345kV Substation.

Major equipment items for the HVDC Converter Transformer;

- HVAC Main Equipment Items;
 - Three single phase reactors
 - Three single phase power transformers
- Valve Hall
 - Valves & associated cooling equipment
- HVDC switchyard Main Equipment;
 - Two resistors
 - Fast cable discharge switch
 - Two phase smoothing reactors
- Protection and Control Equipment

New Comerford 345kV AC Substation

The Comerford 345kV Substation will be built close to the Monroe HVDC Converter Station. Power from the DC overhead line will be transmitted to Londonderry via transmission lines A201 and B202. These two overhead lines are being uprated from 230kV to 345kV, hence the new Comerford 345kV AC Substation will be configured as a Breaker and a half arrangement.

Major equipment items for the new Comerford 345kV Substation are:

[REDACTED]

New Londonderry 345kV AC Substation

The new Londonderry 345kV substation will be built in the path of the existing lines 326 from Scobie to Sandy Pond and 380 from Scobie to Amherst. The two upgraded 345kV from the new Comerford 345kV substation to the new 345kV substation at Londonderry. This substation will have space provisioned for an extra bay to allow for two additional future lines. The new Londonderry 345kV substation is configured as a breaker and a half configuration.

- Breaker and a half arrangement, 4-bay
- Twelve (12) 345kV SF6 gas circuit breaker
- Two (2) 160 MVAR capacitor banks
- Two (2) 345kV SF6 gas switching circuit breaker

14.1.vi. The estimated costs of the proposed project broken out into separate categories as described below for transmission facilities and substation facilities in nominal year dollars.

a. For cost of service or modified cost of service proposals:

1. Provide the capital cost estimate presented as a buildup of costs by category, such as environmental, engineering, civil works, materials, equipment, construction, construction management, physical and price contingencies, allowance for funds used during construction (AFUDC), and all other categories for which recovery under FERC would be sought. These categories are illustrative; aggregate costs into the categories most relevant to the development of the proposed project. All costs should be provided in nominal dollars.

Not applicable for market-rate fixed priced projects.

2. For projects with transmission and substation components, separate the costs into two rows (e.g. use one row for substation construction and a second for transmission construction). Describe the detailed financial plan on a monthly basis during the construction period, e.g., for 3 years or as long as necessary. The plan should present the costs and financial outlays in each month of the construction period, and the corresponding sources of financing (equity contribution and debt drawdown), as in the following illustrative table. Data should include an estimate of the cost of both physical and price contingencies during the construction period. The financing plan should indicate the ability to finance the construction of the proposed project under base case and contingency scenarios.

Not applicable for market-rate fixed priced projects.

3. Describe the proposed financing sources and instruments.

Not applicable.

4. Sources of funds for construction and working capital - include name of entity providing debt financing, loan amounts, interest rates, repayment period, grace period during construction; and equity provided by project sponsor.

Not applicable.

5. Sources of funds for unexpected repairs or replacement construction during the operating period, e.g., replacement of tower. Note: the operating period is the applicant's estimate of the useful life or accounting life of the transmission project element(s).

Not applicable.

- b. If the bidder is proposing fixed-rate pricing rather than cost-of-service or modified cost-of-service pricing, provide sufficient information and assessment to show that the proposed project, including any necessary transmission network upgrades, is financially viable. In this regard, provide capital cost estimates and operation and maintenance cost estimates and the basis for your estimates, including the extent to which estimates are based on vendor contracts or vendor quotes, your experience in the development, construction and/or operation of similar projects, your approach regarding contingency and risk management, and your proposed financing plan. All costs should be provided in nominal dollars, although inflation and cost escalation estimates should be provided. Please describe in detail the due diligence you have conducted in developing your pricing and tariff proposal.

GSPL Project Capital Cost Estimate: Approximately \$1.1 billion.

GridAmerica has worked extensively on the GSPL Project to sufficiently develop the engineering to allow for a robust cost estimate to be produced for the project as described in Section 8.

For the HVDC converter station scope, GridAmerica has worked closely with GE, the preferred converter station vendor, to develop the engineering to a sufficient stage to enable GE to submit pricing to be used in preparation of this bid. GE has visited the proposed convertor station sites and considered specific topographical and geographical constraints in preparing their pricing.

For the HVDC overhead line, GridAmerica's transmission engineers have developed the engineering plan, and the cost estimate was produced by experienced in-house estimating specialists. The estimators utilize extensive data sources upon which to build their estimates, including recent tender data and final account costs across National Grid's extensive portfolio of capital works. The estimators also obtained vendor pricing for key materials and equipment.

In addition to the core elements of the scope, other capex costs have been included to cover other project costs, including GridAmerica project management, site acquisition and permitting.

GridAmerica has completed its own interconnection studies as described in Section 6.7, and the upgrades indicated in these studies have been considered and priced within this bid. ISO-NE Interconnection Upgrades have been estimated for the New England Power AC line upgrades from 230kV to 345kV between Comerford to Londonderry. New substations at Comerford, Londonderry and at Dunbarton Tap have also been included in the base case, as have upgrades to certain Eversource 115kV lines.

GSPL Project Operations Cost Estimate

Operating costs associated with the GSPL Project are primarily related to the converter stations. GridAmerica and its affiliates have extensive experience owning and operating electricity transmission assets in the northeast US and the United Kingdom. This includes the 2000MW HVDC Phase 2 link, the IFA2000 interconnector and the BritNed interconnector (see Section 11.2 for more detail on these projects). In estimating the operating costs for the GSPL Project, GridAmerica has drawn on this vast experience and worked with our major equipment supplier GE to produce robust and realistic cost estimates for the converter station maintenance and DC overhead line maintenance.

The operating cost estimate includes:

- all labor, materials and equipment to complete planned and unplanned maintenance of the converter equipment
- all labor, materials and equipment to complete planned and unplanned maintenance of the overhead line
- all staffing to operate the link
- all planned and unplanned maintenance of ancillary systems
- all property taxes
- all community benefit payments
- all necessary insurances

In addition to operating costs, GridAmerica has included the cost of replacement and refurbishment of capital assets that have a design life of less than 40 years.

Construction Experience and Approach to Contingency and Risk Management

GridAmerica has identified three major cost areas of the project, as outlined above, which are the following: the HVDC overhead line development and capex, the converter capex, and the interconnection in ISO-NE.

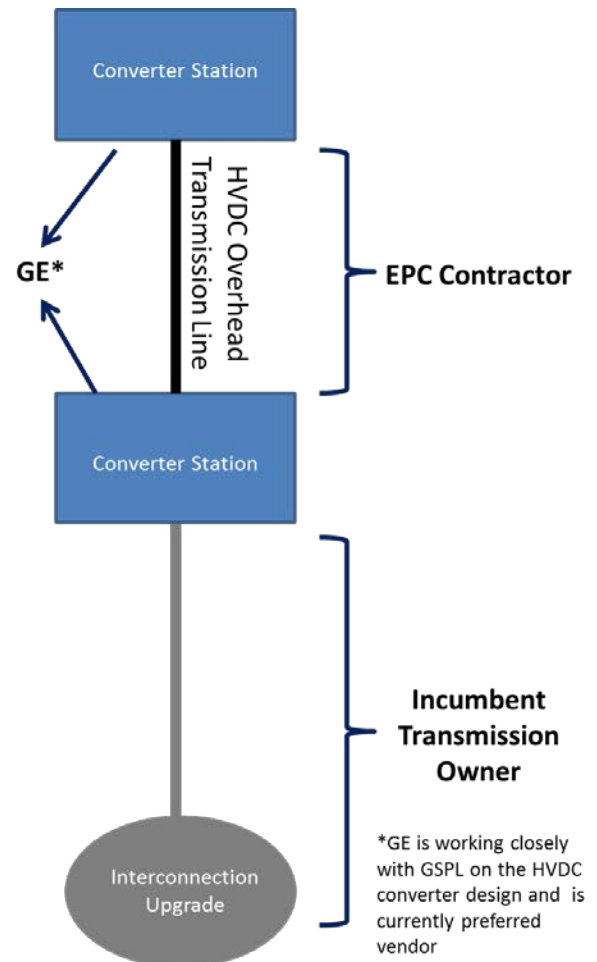
- **HVDC overhead line** – GridAmerica, with National Grid USA (NGUSA) and its subsidiaries, has an extensive track record in developing and financing transmission projects in the U.S. NGUSA’s experience comes from managing and developing its transmission networks in New England and will leverage its considerable expertise and organization to undertake land acquisition, permitting activities and EPC responsibilities for the HVDC line. GridAmerica also intends to partner with VELCO in the development of the Vermont portion of this line.
- **DC Converters** - GE has been providing HVDC solutions for more than 50 years and is proud of having supplied back-to-back and point-to-point projects in many countries all over the world, particularly for systems with very challenging operating conditions.

Interconnection Upgrades – as mentioned in Section 6, the GSPL Project’s interconnection into the ISO-NE Comerford Substation will incur interconnection upgrades including two 110 mile AC lines and the new Londonderry switchyard, which are the vast majority of all of the upgrades required. Of the 110 miles, 108 miles will not require additional right-of-way width, which dramatically lessens siting risks. As also mentioned, to a much smaller extent, the [REDACTED] GSPL Project will have heightened coordination, management and controls on all of these portions of the project’s scope.

By leveraging NGUSA’s extensive experience and best practices in construction implementation, GridAmerica can follow management processes that maintain assurance in accordance with NGUSA business governance and risk management as illustrated below:

Delivering operation effectiveness:

- GridAmerica will establish an oversight team and critical individuals, including resourcing contingency plans. The GSPL Project ensures senior executive awareness and buy-in so GridAmerica team members are properly resourced and focused.
- GridAmerica will confirm that support arrangements, such as project services, Project Management Office, QS/Commercial service, and design approval are in place and



working effectively and continually assess their effectiveness. The GridAmerica team will also confirm that such partner arrangements are adequate.

- GridAmerica ensures each contractor has appointed a named representative in critical roles, and that they have complimentary business continuity plans and always confirms that these appointments have been properly made, and are acceptable using contractual rights.
- GridAmerica will establish engineering, mobilization, demobilization and operations arrangements, following established procedures where possible. If bespoke arrangements are needed, GridAmerica will ensure these are reviewed and authorised by suitability competent persons.
- GridAmerica will confirm all enablers are in place, such as permissions/consents and advance purchase materials.

Financial control:

- GridAmerica confirms robust financial controls are in place and agrees on payment schedules. GridAmerica also agrees on methods of reconciliation and the checking regimes.
- GridAmerica implements robust change control mechanisms for dealing with the authorization of variations, and implements control tracking and benchmark to similar projects.

Deliver regulatory reporting obligations (NEP/Eversource upgrades):

- GridAmerica identifies reporting requirements, including those needed to meet regulatory requirements, and ensure processes exist, including appropriate Key Performance Indicators (KPIs), to report in a complete, accurate and timely manner.

To facilitate reviewing the project success:

- GridAmerica create methods to measure and benchmark the effectiveness and efficiency of project delivery. These will be, but not limited to, on the broad topic basis of Safety, Program, Financial, Environmental and Quality.

To reinforce operational effectiveness:

- GridAmerica identifies the competency requirements for each role; ensures that the people appointed to these roles have the correct competencies and are fully aware of the requirements of their respective roles.
- GridAmerica ensures that when personnel change during the life of the contract an effective handover process is in place to retain the knowledge held by the leaver and ensure that their replacement is competent to carry out their role when they leave.

To maintain performance using the contractual framework:

- GridAmerica will prepare a guidance document on operating contracts and sharing information to gain maximum value from the contractual arrangements. The team will ensure delegations meet GridAmerica requirements and that duties are appropriately segregated.
- GridAmerica will put in place methods of making sure that the GSPL Project, its partners and contractor are fulfilling all their responsibilities contained in the contract.
- GridAmerica ensures that performance measurement includes comparison of actual costs against budget and forecast on a monthly basis, followed by monitoring and investigating where discrepancies occur.

- GridAmerica uses a suite of KPIs to maintain oversight of performance, ensuring that processes include performance verification by more than one source.

To support risk-based management processes:

- GridAmerica ensures that specific individuals are responsible for identifying potential events or scenarios that could have a negative impact on NGUSA's brand and reputation and that those responsible have suitable arrangements and/or metrics in place to monitor the performance of the partner and plans in place to manage the risks, both in terms of avoiding the potential causes and mitigating the consequences of the risks.
- GridAmerica will establish an Early Warning system for material issues that threaten cost, schedule or reputation.

To ensure safe work practices:

- Any prime contractor working on the GSPL Project will be required to complete a project specific Health & Safety Plan (HASP) for submittal to NGUSA before commencing any construction activities.
- This requirement is also found in the NGUSA Contactor Safety Requirements document (see Attachment 9.1.19). It is an all-inclusive document detailing all aspects of safety the prime contractor on the project is required to follow while working on NGUSA projects, including
 - On-boarding responsibilities
 - Project specific safety requirements, including project safety oversight requirements
 - Project safety meeting requirements,
 - Job Brief requirements (& all other project-related safety forms)
 - Incident investigation requirements
 - PPE requirements
 - Training requirements
 - Documentation of employee credential requirements
- The Prime EPC shall assume all safety responsibilities associated with a given sub-contractor they bring on to the project.
- With respect to project interfaces with other utilities (New England Power and Eversource), safety-related matters must be analyzed and discussed as a joint effort both prior to the start of construction and throughout the duration of the project as the need arises.

In all, GridAmerica has done extensive due diligence on the costs of the project, has priced them with appropriate risk contingencies in order to provide a fixed priced tariff, and has the experience and organizational depth to manage the development and construction activities so that ratepayers can receive the least cost option with the least risk.

14.1 vii. *Provide a proposed schedule for project development through release for operation that includes key critical path items, such as:*

- a. Develop contracts for project work

Please refer to Sections 10.1 and 10.2 and the corresponding attachments for detailed schedule and critical path items for the development, construction, and operation of the GSPL Project.

- b. Completion of studies and receipt of approvals needed for the interconnection

Please refer to Sections 10.1 and 10.2 and the corresponding attachments for detailed schedule and critical path items for the development, construction, and operation of the GSPL Project.

- c. Permitting; R/W and land acquisition

Please refer to Sections 10.1 and 10.2 and the corresponding attachments for detailed schedule and critical path items for the development, construction, and operation of the GSPL Project.

- d. Engineering and design

Please refer to Sections 10.1 and 10.2 and the corresponding attachments for detailed schedule and critical path items for the development, construction, and operation of the GSPL Project.

- e. Material and equipment procurement, including identification of long lead time equipment

Please refer to Sections 10.1 and 10.2 and the corresponding attachments for detailed schedule and critical path items for the development, construction, and operation of the GSPL Project.

- f. Facility construction

Please refer to Sections 10.1 and 10.2 and the corresponding attachments for detailed schedule and critical path items for the development, construction, and operation of the GSPL Project.

- g. Agreements (interconnection, operating, scheduling, etc.) with other entities

Please refer to Sections 10.1 and 10.2 and the corresponding attachments for detailed schedule and critical path items for the development, construction, and operation of the GSPL Project.

- h. Pre-operations testing

Please refer to Sections 10.1 and 10.2 and the corresponding attachments for detailed schedule and critical path items for the development, construction, and operation of the GSPL Project.

- i. Project in-service date

Please refer to Sections 10.1 and 10.2 and the corresponding attachments for detailed schedule and critical path items for the development, construction, and operation of the GSPL Project.

j. Other items identified by the bidder

Please refer to Sections 10.1 and 10.2 and the corresponding attachments for detailed schedule and critical path items for the development, construction, and operation of the GSPL Project.

- 14.1. viii. Bidder must indicate whether it proposes to recover abandonment costs for its transmission project from the Distribution Companies, as described in Section 2.2.2.6.2 of this RFP. If so, Bidder must acknowledge that recovery of any such abandonment costs shall be in accordance with FERC rules and policies, and also acknowledge that in no event will a Bidder seek to recover abandonment costs if the abandonment was caused directly or indirectly by some act or failure to act of the Bidder. Bidder must further affirmatively commit not to seek from FERC or any other agency or authority any treatment of abandonment costs inconsistent with the provisions of Section 2.2.2.6.2 of the RFP. To the extent the Bidder proposes to recover abandonment costs, such proposal should be further described as set forth in Appendix C-2 of this RFP.*

To eliminate ratepayer exposure to abandonment cost risk, GridAmerica will not seek abandonment cost recovery or any cost recovery prior to the selection of the winning bidder. GridAmerica has proposed a Fixed Rate Schedule, as shown in Section 14.3. This aspect of the GSPL Project is a clear advantage and benefit compared to other cost of service transmission project proposals that entertain abandonment costs, even when those abandonment costs have cost caps.

14.2 The proposed payment required for the transmission project and all system upgrades.

The delivered energy bid herein reflects RES Canada's Quebec transmission costs and proportional use of the GSPL Project capacity. GridAmerica will seek to recover the value of capacity not used by RES Canada on a merchant basis through short-term sales to generators wishing to export to the New England region. The costs of such transmission will not be assigned to customers. The recovery of such costs is entirely at the risk of GridAmerica, not customers, regardless of the volume of merchant transfers realized over the line.

- 14.2.i. All proposals must include significant cost containment as stated in the RFP.*

This proposal includes a fixed rate between the GSPL Project and RES Canada and ensures the EDCs that any transmission cost overruns or unforeseen schedule delays will not put ratepayers at any risk. As outlined in Section 14.1.vi.(b), GridAmerica has shown sufficient information and assessment of the GSPL Project's costs and risks to demonstrate the financial viability of the project and the experience of GridAmerica on large complex electric transmission projects. As explained in Section 14.1.viii, GridAmerica has eliminated ratepayer

exposure to abandonment cost risk by agreeing not to seek recovery of abandonment cost or any cost recovery prior to issuance of the RFP or selection of the winning bidder.

14.2.ii. List all situations which may change the proposed payments by consumers during the contract term.

GridAmerica has proposed a Fixed Rate Schedule, as shown in Section 14.3, which does not expose consumers to the risk of any increased payments. The Fixed Rate Schedule will cover all capital costs and operating costs of the GSPL Project, including EPC price, interest rates, currency risk, and all other costs including but not limited to development costs, system upgrade costs and host community benefits. The Fixed Rate Schedule is fixed throughout the contract term. Therefore, consumers and EDCs will not be exposed to adjustments of the contracted rate schedule.

14.2.iii. Identify any limits placed upon the bidder's post-contract term rates according to current FERC rules.

GridAmerica will file for Negotiated Rates under Section 205 of the Federal Power Act upon selection of the GSPL Project. This filing will include the rates, terms and conditions for the interstate electricity transmission. As proposed within the Schedule in Sections 10.1 and 10.2, this filing will occur shortly after the selection of the winning bidder and should be approved within a three-month timeframe.

14.2.iv. Identify all other project revenues which may be received by the bidder during the contract term which would not reduce rates paid by consumers.

GridAmerica plans to sell capacity that is not used by the wind resources to other generators selling into the ISO-NE market. By assuming merchant risk on the sale of GSPL capacity not used by contracted wind suppliers, GridAmerica has reduced the cost of transmission associated with the delivery of clean generation over the project to the benefit of customers.

14.2.v. If the proposed payments may change during the contract term or the proposal is based on cost of service, the bidder must provide the method that transmission owner shall use to determine the payment for the Transmission Project under the transmission Rate Schedule or Tariff and Service Agreement to be filed with FERC. If the proposed payment is a formula rate, the Eligible Bidder must also provide the formula and its proposed inputs that the transmission owner will file with FERC.

As stated in Section 14.2(ii), and differently than other cost of service projects, GridAmerica does not propose to change the proposed payments during the contract term. As stated the GSPL Project is a fixed price offer; it is not a cost of service bid or a formula rate bid.

14.2.vi. If the proposed payment is based on the Transmission Project's cost of service and may change during the contract term based on changes in the cost of service, a full revenue requirements model must be included and submitted as a working Excel spreadsheet with the formulas intact.

- a. Provide the annual revenue requirement forecasts for the project – including assumptions. Provide a draft version of the revenue requirement calculation in a format that is similar to what would be included in the Rate Schedule or Tariff and Service Agreement application to FERC, indicating the forecast revenue requirement amounts and all assumptions used in the calculations. This should include but not be limited to the assumptions regarding rate of return, depreciation life, split between debt and capital, AFUDC and weighted cost of capital, and a detailed estimate of the anticipated average annual operating and maintenance cost. Provide the information requested in Section 14.1.a of the Bidder Response Package.

Not applicable.

14.2.vii. If the pricing proposed is based on cost of service, detail all cost containment commitments. Examples of such commitments include fixed price components, cost overrun restrictions, or other cost bandwidth provisions that are proposed to limit ratepayer risk must be clearly defined.

Not applicable.

14.2.viii. Please include full and complete descriptions of all cost containment measures that you propose to be included in your pricing. Additionally provide any supporting documentation for any savings or methods of savings including cost caps on any portion of your project. Please include working excel spreadsheets to more fully explain how your cost containment measures should work. Please provide details and notes that describe the nexus between the cost containment provisions in your proposal and those supporting documents and spreadsheets. Please provide examples about how any cost containment measures you are proposing would work.

GridAmerica has proposed a Fixed Rate Schedule to RES Canada as stated in the Executive Summary. As mentioned in Section 14.2.i, the GSPL Fixed Rate Schedule and proposal ensures the EDCs that any transmission cost overruns will not be borne by ratepayers. With that said, as in accordance with Section 14.1.4.b., GridAmerica is confident in its cost estimation and the analysis associated with those costs and schedules.

14.2.ix. To the extent that you are proposing different interconnection scenarios that affect cost please include full and complete cost information on each scenario. Please describe all interconnection and transmission upgrade costs required to interconnect at the Capacity Capability Interconnection Standard and to ensure full dispatch, including transmission upgrades that may need to occur beyond the point of interconnection.

For either the Preferred or Base Scenarios, the GSPL Project plans to construct the following new facilities in order to deliver the proposed energy:

- Construction of new 1200 MW Voltage Source Converter Stations in Norton, Vermont and Monroe, New Hampshire, and construction of a new overhead 400kV HVDC transmission line between the two converter stations.
- Conversion of the existing A-201 and B-202 230kV transmission lines to 345kV between Comerford substation in northern New Hampshire and a new Londonderry substation in southern New Hampshire.
- Construction of a new Comerford 345/230kV substation in Monroe, New Hampshire. This substation will be a breaker-and-a-half configuration terminating the HVDC line, **[REDACTED]** (10% impedance on OA cooling base) connecting to the existing 230kV substation, and the two 345kV lines that will terminate at the new 345kV breaker-and-a-half substation in Londonderry, New Hampshire.
- Construction of a new 345kV substation in Londonderry, New Hampshire. This substation will be constructed in a breaker-and-a-half configuration. The Scobie Pond – Sandy Pond (326), Scobie Pond – Eagle (380), and Scobie Pond – Tewksbury (3124) 345kV lines will looped into the substation⁵. Construction of a new 345/230kV substation in Dunbarton, New Hampshire. This substation will consist of one **[REDACTED]** (10% impedance on OA cooling base) with a single 345kV circuit breaker connected to the B-202 345kV line, and will supply the existing Dunbarton 230kV tap line to Merrimack.
- Construction of a new 230kV Double Circuit Tower line between North Litchfield station and the new Londonderry station. In the Preferred Scenario, these two lines would bypass the Londonderry station and interconnect Granite Ridge G1 and G2 radially to the Tewksbury 230kV station. In the Base Scenario, the lines would interconnect Granite Ridge G1 and G2 to the new Londonderry station, via two 345-230kV autotransformers.

In addition, the following AC network upgrades may be needed to support the delivery of 1200 MW of capacity from the GSPL Project in conformance with ISO New England Planning Procedure 10 (PP10):

[REDACTED]

Upgrade Littleton 230/115kV transformer T41 terminal equipment

Note that the Beebe River – Huckins Hill (Z180) and Ashland – Pemigewasset (E115-2) line sections have already been identified by ISO-NE as existing system reliability needs in the New Hampshire 2023 Solutions Study and most likely would not be the responsibility of Granite State Power Link. As mentioned in Section 14.1.vi(b), GridAmerica has considered the Preferred and Base Scenarios and priced the interconnection upgrade facilities within the GSPL Project offer.

14.2.x. Please describe the coordination of the availability of the Clean Energy Generation and any associated transmission or distribution facilities. All proposals must include a project schedule, and proposals including a combination of transmission

⁵ For the Base Scenario, the Londonderry substation would also include a 5th bay which would accommodate the two 230kV lines from N Litchfield, along with two 345-230kV autotransformers.

and Clean Energy Generation should propose complete critical path schedules, for both elements of the project, from the notice of selection for contract consideration to the start of commercial operations (the "Baseline Schedule"). Please describe all aspects of your proposal that protect ratepayers from risks associated with payments for transmission costs when any associated expected Clean Energy Generation, as proposed by the bidder, is absent, reduced, or curtailed as compared to the Baseline Schedule.

Under this Category II Bid (as per RFP Section 2.2.1.3(ii)), Bidder will enter into a Transmission Service Agreement (TSA) directly with GridAmerica to provide for service to deliver the RES Canada Portfolio to the Distribution Companies in accordance with the terms of the PPAs. Key terms of the TSA with GridAmerica have been discussed and provide (i) for protections against curtailment due to low availability or increased losses; (ii) for clarity with regard to network upgrades and the fact that these are the responsibility of GridAmerica and (iii) for a fixed-price wheel to provide for delivery at the Point of Delivery in ISO-NE.

This proposal includes a fixed rate between the GSPL Project and (EDF or RES) and ensures the EDCs that any transmission cost overruns or unforeseen schedule delays will not put ratepayers at any risk. As outlined in Section 14.1.vi.(b), Section 7 and Section 10, GridAmerica has shown sufficient information and assessment of the GPSL Project's costs and schedule to demonstrate the viability of the GSPL Project. As explained in Section 14.1.viii, GridAmerica has eliminated ratepayer exposure to abandonment cost risk by agreeing not to seek recovery of abandonment cost or any cost recovery prior to issuance of the RFP or selection of the winning bidder.

14.2.xi. Please describe your approach to avoid line losses.

As stated in Section 6.6, GridAmerica has submitted an interconnection request for the GSPL Project with HQT as the ETU project is proposed as a new HVDC based link between Quebec and New England. A copy of the interconnection request is included in *Attachment 6.6.2 (confidential) - Hydro Quebec Interconnection Request*. The HQT interconnection request was requested for 1225 MW of long-term firm point-to-point transmission service. The delivery of 1225 MW at the Vermont and Quebec border will ensure delivery of the full 1200 MW offered at the ISO-NE interconnection point at the ISO-NE substation, Comerford.

14.3 The schedule of the payments defined in 14.2 above including when the payments will commence, how often payments will be required and the length of time over which payments will be required. In no event may payments commence before the Transmission Project is placed in service.

RES Canada will make payment to GridAmerica for transmission service capacity from their respective projects to be delivered to ISO-NE at the new 345kV Comerford Substation, and thereby RES Canada is providing the all-in cost of energy with transmission at the point of delivery, which is the ISO-NE new Comerford 345kV substation, on a per MWh basis.

14.4 The design life of the project

Major elements of the GSPL Project have a design life of at least 40 years. Overhead transmission lines have an expected lifetime of approximately 60-80 years, with mid-life refurbishment needed after 40 years. Electrical components of HVDC systems have life expectancy of 40 years. Valves and control systems within the converter stations are likely to need upgrades or replacements between the end of the 20-year term of the RFP and 40 years.

14.5 A description of the reliability benefits of the proposed Transmission Project and its impact on existing transmission constraints

Clean renewable energy will be delivered to New England via the Granite State Power Link, a new controllable HVDC Voltage Source Control transmission line connecting ISO-NE to Quebec, Canada. This additional energy resource is expected to increase the reliability to the entire ISO-NE region, including Massachusetts, by providing up to 1200 MW of additional capacity between the Quebec and ISO-NE control areas.

[REDACTED]

The HVDC VSC technology allows fully independent control of both the active and the reactive power flow within the operating range of the HVDC VSC system. The active power can be continuously controlled from zero to a full power import into ISO-NE. The active power and reactive power are controlled independently, and even at zero active power, the full range of reactive power can be utilized to support AC system voltage.

VSC stations can maintain a desired voltage level in the connected AC network. Voltage stability issues can limit power transfers in the transmission grid. If a voltage collapse were to be imminent, HVDC VSC could support and stabilize the grid with the necessary reactive power. Unlike HVDC classic converters, the HVDC VSC-based converters can operate continuously at low power including 0 MW. In this way, the HVDC VSC-based converter can operate essentially as a Static VAR Compensator to enhance AC system reliability.

The AC voltage control feature of the VSC will also help to support and dynamically stabilize the AC system voltage during transmission line and load switching events that take place over the course of system restoration.

By way of example, during the August 2003 blackout in the Northeastern U.S, the Cross Sound Cable linking Connecticut and Long Island, which uses ABB's HVDC Light VSC-based technology, provided valuable power transfer and voltage control during the restoration of Long Island. The GSPL Project will have the added benefit of a black start operating mode where the VSC converter can be operated to control voltage and frequency into a network that has no generation or synchronizing sources.

Furthermore, the proposed GSPL Project could be used by ISO-NE System Operators to regulate power from Quebec under emergency conditions. The very fast ramping provided by the VSC-based technology allows operators to rapidly increase or decrease imports over the link as may be required to maintain ISO-NE system security during emergency conditions.

As described in Section 6.14, the Granite State Power Link's point of interconnection, the associated AC system upgrades, and corresponding electric system topology changes increases

the New England north to south thermal transmission capacity by 650 to 900 MW as compared to pre-GSPL Project limits. Comparative transfer analysis conducted by GridAmerica showed that pre-GSPL Project north to south thermal limits were generally in the Deerfield to Scobie transmission corridor. Since GSPL Project's power will primarily flow south from northern New Hampshire toward the GSPL Project's planned Londonderry 345kV substation, this avoids the limiting Deerfield to Scobie constraint and other constraints in the New Hampshire Seacoast area, and higher overall north to south transfers can be achieved post-GSPL Project.

SECTION 15 OF APPENDIX B TO THE RFP
EXCEPTIONS TO FORM PPA AND OR VARIATIONS FROM THE PROPOSED TARIFF
REQUIREMENTS

Please attach an explanation of any exceptions to the Form PPAs set forth in Appendix C-1 or Appendix C-2 to this Notice, including any specific alternative provisions in a redline format to the Form PPA.

Transmission bids must contain a proposed tariff, rate schedule or transmission service agreement ("Transmission Agreement") that GridAmerica proposes as the vehicle for recovery of its transmission costs from the Distribution Companies. In addition, all transmission bids must separately contain a detailed summary of the material provisions of the proposed Transmission Agreement. Such a summary should include, but not be limited to, a discussion of the key provisions set forth in Appendix C-3, as well as a cross-reference to the corresponding sections of the proposed Transmission Agreement where such provisions may be found.

Bidders are discouraged from proposing changes to the Form PPA and or variations from the Proposed Tariff requirements.

RES Canada Wind Portfolio

Please refer to *Attachment 15.1 (confidential) – RES Canada Exceptions to the PPA*.