

Siemens Power Technologies International

Shaping the utility of the future

End-to-end Smart Grid consulting for New Brunswick Power

At a glance

For its electrical network modernization project, the integrated utility New Brunswick Power (NB Power) was looking for a partner with profound expertise in the technology domain as well as in business strategies. They found such a partner who can help them become a "Utility of the Future" in Siemens. Siemens delivers end-to-end Smart Grid consulting services around the world. This includes designing of extensive modernization plans and enabling of the operational deployment while ensuring continuous value management.

NB Power is currently implementing a ten-year Smart Grid Reduce and Shift Demand (RASD) network modernization plan together with Siemens. The aim is to improve both the electrical network operations as well as the economic situation for the utility and its customers. Simply put, every dollar invested within the program shall be returned by two. As a result of the plan's implementation, NB Power will save 1.3 billion \$ CAD of CAPEX and OPEX costs (net present value) over 25 years. The implementation of this ambitious and future oriented modernization plan makes NB Power a leader in the Smart Grid world today.

The challenge

A key operational challenge for NB Power is the extreme spread between summer and winter peak in electricity demand due to the rough climate and the predominant use of electrical energy for heating space and water. Generation capacity of almost 1,000 MW is foreseen to accommodate peaks that occur only 10-20 days per year.

In addition to the challenges posed by large seasonal peak demand, NB Power has also set a target to integrate a 40 per cent share of renewable generation by 2020 in its service territory. Naturally, expansions in generation and network capacity that are only needed to accommodate seasonal demand peaks are a significant cost driver, both

for the utility as well as for the end-customer. Faced with these challenges, NB Power recognized the urgency of having more control over electricity consumption to realize significant cost savings on both generation and network side.



Figure 1: NB Power – integrated utility of the New Brunswick province



NB Power is the vertically integrated, publicly-owned electric utility of the province of New Brunswick in Canada. It serves nearly 400,000 residential, commercial and industrial customers and has 2,300 employees. It is connected to four other jurisdictions: Prince Edward Island, Nova Scotia and Quebec; as well as Maine in the U.S. The utility has the ability to import or export 60% of its 4,000 MW generation capacity. The diversified generation portfolio ranges from hydro over coal and oil to nuclear with an ambitious target to accommodate a large share of wind power in the coming years.

From a strategic angle, NB Power had defined three leading objectives:

- to become a top quartile performer compared to public and private utilities in North America,
- to systematically reduce debt, while investing in new generation and maintaining stable rates for its end-customers, and
- to invest in technology, educate customers and incentivize consumption that will reduce and shift demand (RASD) to ultimately defer significant generation investment.

Taken together, NB Power's ambition was to leverage innovative technology solutions in order to master the challenges imposed by climate, energy generation mix and network operations. NB Power wanted to prove that successful deployment of Smart Grid technologies maximizes the benefits for all stakeholders: the utility, the province as well as its end-customers.

Our solution: end-to-end Smart Grid consulting

To start transform New Brunswick Power into a "Utility of the Future", Siemens' Smart Grid Compass™ was used as a guiding framework, incorporating the Reduce and Shift Demand (RASD) strategy highlighted by the utility.

The framework includes a holistic and systematic methodology that aligns business objectives, business capabilities with the corresponding technologies. For NB Power, using Smart Grid Compass™ methodology ensures that solutions and planning are directly correlated to business objectives and value-creation instead of following industry hype cycles. With that context, the current partnership between NB Power and Siemens rests on the strong foundation of Smart Grid Compass™ and its structured, systematic and value-oriented methodology.

The Smart Grid Compass™ is executed in three modular phases and addresses the five key domains of a utility's business: network operations, customer services, asset and workforce management, smart energy, and smart organization.

NB Power and Siemens have jointly executed the three modular phases of Orientation, Destination to Routing. As an outcome of this journey, Siemens has designed NB Power's Smart Grid roadmap that also includes key initiatives addressing all five domains. A clearly positive business case and a sound ROI has been the underlying principle guiding all technology deployment decisions.

Value improvement – a cornerstone of the Smart Grid Compass™ – is ensured by systematic leveraging of technology synergies. This means that technology solutions which enable multiple capabilities in different directions are deployed earlier in order to minimize technology costs, maximize value-generation and provide return on investments as soon as possible.

Consequently, "end-to-end" consulting in this context comprises the strategy and roadmap development for NB Power, as well as coaching and support throughout operational deployment, ensuring that targets are reached in the most effective and efficient way.

"We wanted a partner that could do everything [...]. Although there is enough evidence around the world to show that the component parts of the Smart Grid work, it is the integration of all the parts that has to be done. Siemens is the perfect partner to help us achieve that."

Gaëtan THOMAS, CEO at NB Power

While the Siemens Smart Grid Compass™ provides a strategic framework for capturing the vision of NB Power by quantifying the company's objectives and recommending concrete actions, the implementation of these concrete actions takes place through the value management program embedded within the NB Power Smart Grid program.

The Value Management Program focuses on the project as a whole rather than its modular components taken separately. Opportunities for innovation are monitored at every stage to find the most cost-effective means of implementation. A closed-loop approach for review, evaluation and action ensures that potential for business improvement are recognized and dealt with in a structured process. Key performance indicators (KPIs) are used to define and control actions and performance along the entire program deployment timeline.

Embedding value management into Smart Grid deployment is a unique Siemens approach. The aim is to reach the assigned value targets efficiently in order to meet NB Power's business objectives. This is accomplished by delivering the deployment program steps at least-cost and consistent with the required levels of quality and performance.

Conclusion

NB Power's plans for the future will not only influence the way it does business today, it will also have a significant impact on all its stakeholders. A fundamental business transformation is needed at NB Power to enable it to evolve and adapt flexibly as multiple waves of technology and business changes ripple through its environment in the next 10 years.

NB Power's Smart Grid program articulates a fundamental business transformation that will have significant positive impacts for the end-customers, the utility as well as the provincial economy. This fundamental business transformation is made possible thanks to Siemens' "end-to-end" Consulting approach that leverages synergies systematically, reduces complexity and risk for the utility, and realizes value improvement in short as well as long term.

Siemens' "end-to-end" consulting approach therefore enables NB Power realize its aspirations and commit to a shared future through the long-term partnership agreement between the two companies.

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