

DR Lessons from ENBALA

**A Case Study Interview in the
Lessons Learned Series
prepared for the National
Action Plan on Demand
Response**

Produced by
The Association for Demand Response and Smart Grid
(ADS)
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www.demandresponsesmartgrid.org

Overview

- In the Energy Independence and Security Act (EISA) of 2007, Congress directed that DOE and FERC work with stakeholders to develop a National Action Plan on Demand Response (NAP). The Plan was established and stimulated activities which would foster the expansion and enhancement of demand response, and support those who were active in working to make this happen.
- One of the needs of the DR “community” that was identified during the NAP’s development was documentation of “lessons learned” by those involved with DR programs, products, and activities. The desire by stakeholders was to be able to be informed by this information so as to identify potential pitfalls, as well as best practices.
- As part of the NAP implementation, and with DOE support, the Association for Demand Response & Smart Grid (ADS) is working to identify and document “lessons learned.” This Case Study Interview is part of that ADS effort.

What is a Case Study Interview?

- A Case Study is normally thought of as a detailed report that, in retrospect, thoroughly examines a project or program to document results and make observations. Case studies are highly desirable to DR stakeholders for their potential to identify lessons learned. But most case studies focus on documented results, and few devote much effort, if any, to lessons learned.
- In an ADS Case Study Interview, the emphasis is on identifying and capturing lessons learned. The focus is on interviewing one or more persons that were involved in the subject effort and letting them talk about how things went, what they would have done differently, etc.
- A Case Study Interview is produced by conducting a private webinar between an ADS interviewer and the interviewee(s). The Webinar then becomes a podcast which can be viewed by anyone, and the transcript of the interview is also available.

Case Study Interview – ENBALA

- Interviewer: Dan Delurey, ADS
- Interviewee: Ron Dizey, EVP and Chief Revenue Officer
- Focus of the Interview: Real-time integration of intermittent wind power through a network of demand-side loads with NB Power in eastern Canada

Description of the Program

- What is the name of your program/project?
 - Dispatchable demand management to support wind integration
 - Part of a larger initiative called Reduce and Shift Demand (RASD)
- What type of program/project is it?
 - Demand-side management (DSM) program
- Who are you providing services to?
 - New Brunswick (NB) Power, an eastern Canadian utility company

Description of the Program (cont.)

- Can you give us an overview of what you are doing?
 - Connect a network of commercial electricity customers to perform dispatchable demand management
 - Support integration of wind energy using an automated, real-time approach
 - Allow for continuous dispatchability of demand to integrate wind without impacting operations
- Is this a typical program/project that you do or is it a one-off of some kind?
 - ENBALA's real-time demand management platform is highly versatile. Here we use it to support wind integration, but there are other DSM applications available
 - Connecting and engaging customers to help manage the grid is the basis of our business;

How This Came About and Why

- What was the primary driver for this?
 - Powershift Atlantic is a collaborative research initiative led by NB Power to support a reliable grid and the integration of wind power
 - NB Power was looking for unique demand management technologies that would help efficiently integrate reliable – but intermittent/unpredictable – wind power
 - NB Power was looking to determine the role that demand can play in the more efficient management of their grid, including reducing the use of fossil fuels to integrate renewables

Goals and Measurement

- What were the top goals for you and the other parties involved? What was the most important one?
 - For NB Power: Reliably integrate wind; provide energy capacity; further engage customers in grid management
 - For ENBALA: Help NB Power meet stated goals; successfully demonstrate that real-time, dispatchable DSM is a viable solution for the grid; help NB Power connect a widespread and diverse network of customers
 - For customers: Participate in a non-disruptive DSM program; contribute to their community and environment
 - Most important – customers are able to define their participation; keep them happy – crucial for successful DSM program
- What measurement objectives were set at the outset?
 - Support the province's stated goal of 40% renewable energy by 2020

Timeline

- How long has the program/project been in existence?
 - Won RFP in early 2012; signed contract in spring of 2012; live since fall 2012
- How long did it take to develop it?
 - Worked with NB Power to develop/create network of customers once contracted; site implementation, testing and demonstration throughout 2012; live and responding to real-time energy requests from NB Power since fall 2012
- Did the program require regulatory approval?
 - No -- because NB Power is a vertically integrated utility

Design and Development Phase

- What were the major issues and challenges for you in the design phase?
 - Our demand management platform, GOFlex, was already fully designed and developed -- but we did have to integrate with NB Power's VPP
 - The VPP is designed to take wind and demand information and develop a preferred load profile -- our platform manages loads to fit that profile.
 - Program design involved working with NB Power and their customers to connect them to our network through site implementations and testing
 - Customer acquisition is always challenging for new programs
 - Used our experience with customer recruitment with this type of program to help design an appropriate offering and contracting process.
- What kind of research did you do up front?
 - Worked with NB Power to target high potential opportunities, with significant available operational flexibility
 - NB Power used this information to help target customers
 - We investigated energy-consuming equipment that was at a facility, then reviewed their power usage over the past year to determine the amount of operational flexibility available

Design and Development (cont.)

- Did you hire outside experts to help? What kind?
 - Our on-site implementation and connection to the GOFlex platform involves installing an LCP (Local Communication Panel) and metering as well as programming existing BAS/BMS
 - We worked with customers' trusted contractors for this stage
- Was this a turn-key project, or are you involved on an ongoing basis?
 - Most of our work was upfront -- helping with customer targeting and then very significant effort involved in customer connectivity.
 - We are also involved on an ongoing basis -- we are operating 24/7, responding to energy dispatch requests from NB Power that call for a specified increase/decrease of power over a set period of 15-minute intervals
 - We continuously monitor the real-time operating status of each asset at each customer site as well as their previously defined operating parameters
 - Our NOC (Network Operating Centre) is continuously managing the DSM on a real-time, ongoing basis
- What is the role of other parties, including clients and customers of the client
 - NB Power continues to measure and assess the effectiveness of the program

Technology

- What kind of technology is required?
 - We operate GOFlex, a real-time, dispatchable demand management platform
 - Sophisticated ILM platform that offers non-disruptive, customer-defined participation in real-time DSM programs
 - Capable of continuous response to bi-directional (increase or decrease usage) grid signals
 - On the customer side, we install an LCP (Local Communications Panel), and GOFlex connects to the existing building automation/management system which already controls their participating energy-consuming assets
- What were the main lessons learned in choosing and/or deploying your technology?
 - It is preferable and more beneficial to connect customers through their existing BMS/BAS, and define operating parameters for participation in the program; better for customer operations and the DR response
 - Binary (on/ off) assets work well for traditional DR programs while analog (VFD/ analog heating coils) assets work well for this type of real-time, intelligent load management (ILM) program
 - For real-time, automated DSM, it is important to understand the in-depth details of the BAS/BMS, not just overall energy/power site measurements
 - Water pumps in water/wastewater plants and commercial/industrial HVAC system are ideal load types for continuous DSM

Technology (cont.)

- What were the main lessons learned in your technology deployment?
 - Important to develop easy-to-use, reliable tools for site integration, especially since a limited amount of testing is done on target (for the solution to be scalable this has to be the case, plus on target testing is typically disruptive to the operation of the site, so it's not a viable option)
 - Efficient, effective, and scalable configuration management systems need to be in place when a high number of individual site configurations are being dealt with
 - NOC operators can easily be overwhelmed if alarms (noting operational issues) are not configured appropriately; establishing an alarm hierarchy and associated response procedures requires an good understanding of the technology and the experience that comes from operating a network of diverse loads
 - Importance of effective communication and agreement on security requirements at an early stage of site integration
 - Great value in developing tools and operating procedures that don't undermine security without being burdensome to the customer
 - Careful consideration of M&V requirements up front can substantially impact program costs

Promotion, Marketing and Communications

- How many customer locations are involved?
 - Our “customer” is NB Power – the utility utilized our platform to connect to over 25 of their small to medium commercial customers with over 2,000 energy-consuming assets
- Were you involved in marketing and promoting to customers?
 - NB Power handled all the marketing and promotion to their customers
 - ENBALA played the role of technology and load integration expert for the customer and the utility
- What worked and what didn't?
 - Customers were eager to participate; positive relationship with utility
 - NB Power as the leader and the face of green innovation; worked well for their customers
- What were the main lessons learned in this area?
 - Customers care about their environment and community
 - A positive customer/utility relationship is important
 - If the customer can take part in a non-disruptive program and define their own participation, they will be willing to contribute to grid operations and optimization

Implementation and Management

- Did you use outside contractors to implement and manage the program?
 - ENBALA managed the entire integration process
 - ENBALA used customers' local and trusted controls contractors; already familiar with site equipment and controls
- How many people are involved in administering and managing the program?
 - Project Manager – coordinate the activities of the project
 - Controls Engineer – develop the control strategy for the site
 - Electrical & Instrumentation Engineer – develop the electrical and programming scopes and perform site testing
 - Electrical Contractor – electrical install
 - Controls Contractor – site programming changes
 - CAP – final testing before connecting to the network
 - NOC – 24/7 monitoring of the continuously connected network of participating customers and the dispatch request from NB Power

Changes?

- Over the course of the program/project, what changes were made in the following areas?
 - Goals and Objectives
 - Program Design
 - Measurement and Evaluation
 - Technology
 - Target Audience
 - Marketing and Recruitment

Looking Back...

- What were some things that happened that were unexpected or surprising? What did you do?
 - Many site managers actually did not know the status of their own equipment
 - When we began site audits and integrations, we discovered a number of operational issues
 - Customers were happy to receive this insight and make the necessary improvements to improve savings and cut unnecessary costs
- What are some key takeaways that you think would be useful to others that might be involved in a similar endeavor?
 - Importance of positive customer engagement
 - In order for a DSM program to be truly successful, customers must be content and on utility's side
 - From an implementation perspective, it is also important to involve the controls contractor early
- What would you have done differently if you had it to do over again?
 - Focus on energy-consuming equipment integrated with BAS/BMS only, avoiding third party assets
 - If doable, configure operating parameters in ENBALA LCP instead of BAS/BMS
 - Avoid interfacing with out-of-date control building control systems

Looking Forward...

- How do you see your business changing as the electricity and utility industry changes?
 - Utilities already successfully use traditional DR; but the modern power system is evolving – more renewable energy is added to the grid, fluctuating demand, coal is retiring; we are moving from centralized to distributed approach
 - Grid operators and utilities will need a more holistic grid management approach – view the demand side as a controllable resource using an ILM platform like GOFlex
 - Our type of business will become more and more crucial for the utility of the future; it has already begun
- How do you see the type of project you just talked about changing or evolving pursuant to those changes?
 - NB Power utilizing loads to respond to energy dispatch requests based on needs of the grid, which helps integrate/offset wind power
 - This is valuable – but the demand side can do so much more – evolve this already connected network of customers into a dispatchable resource that is supporting a number of aspects of utility operations
 - Such as improving generator efficiency, frequency regulation, integrating energy storage, etc.

Looking Forward (cont.)...

- What are the barriers to further growth in the part of the smart grid space in which you do business?
 - Utilities need to change their thinking – move away from silos to a more holistic approach to grid management
 - Think of the demand side not as something that just happens, but as a controllable resource akin to a generator
 - Risk aversion – need to reward embracing emerging technologies and innovation
 - Regulatory barriers – extensive stakeholdering can be an issue
 - Customer Engagement – Real-time, continuous DSM program can seem invasive; in reality it's not – customers are able to define own parameters and don't even realize participation is happening
- How much does your business model depend on technology evolution vs market development or change?
 - It is all about market development. The technology has already been created and evolved
 - “Market Development” means getting utilities to think differently about their future
 - Embrace the role their customers can play in the grid; help them manage their bills; connect and enable them

For More Information

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