



ADVANCED METERING INFRASTRUCTURE (AMI) PROJECT

Project Status Report to NBEUB

For Quarterly Period ending June 30, 2022

ADVANCED METERING INFRASTRUCTURE (AMI) PROJECT

Project Status Report to NBEUB

Background

New Brunswick Power Corporation (NB Power) is continuing to leverage technology advancements that will improve its ability to respond to changing customer expectations, address climate change, modernize the grid, and focus on continuous process improvement. New technologies such as Advanced Metering Infrastructure (AMI) will enable NB Power to improve its service to customers and help them better understand their electricity usage and use energy more wisely. AMI will help NB Power better manage the rising demand on the electricity system well into the future, while laying the groundwork for a wide range of new customer benefits.

AMI is foundational to the grid modernization program and involves three key technologies:

1. Advanced Meters
2. Head-End System (HES)
3. Meter Data Management System (MDMS)

These three AMI technologies, in combination with the associated communications network, are critical components of NB Power's overall grid modernization program.

The many benefits of AMI include providing tools and programs to give customers more control over their electricity consumption and costs and laying the groundwork for new customer-focused programs and services. Within NB Power's day-to-day operations, AMI will also increase efficiency of meter data collection, billing, and disconnects/reconnects. Power restoration will be improved as a result of quicker notification of outages which could reduce response time.

NB Power filed an application for AMI with the New Brunswick Energy and Utilities Board (NBEUB) on August 1, 2019, and the matter was heard by the NBEUB January 13-22, 2020. As a result of the requested and Board-approved delay due to the COVID-19 pandemic, on September 4, 2020, the NBEUB approved NB Power's AMI capital project application and work is underway with the project team and third-party vendors.

The NBEUB decision directed NB Power "to propose, at the next general rate application, a set of metrics or progress indicators to track the project. This should include progress indicators to track the roll-out of the project, as well as its timeline, costs, and the realization of its quantified and non-quantified benefits. The proposal should also include a reporting and review schedule, and a communication plan for stakeholders and ratepayers."

NB Power proposed a reporting format in response to the directive. The format was reviewed and approved by the NBEUB on May 27, 2021 on a preliminary basis with specific conditions. This report complies with the approved format and conditions, which requires NB Power to provide this report electronically on a quarterly basis to the NBEUB and share the report on www.nbpower.com for public access in both official languages.

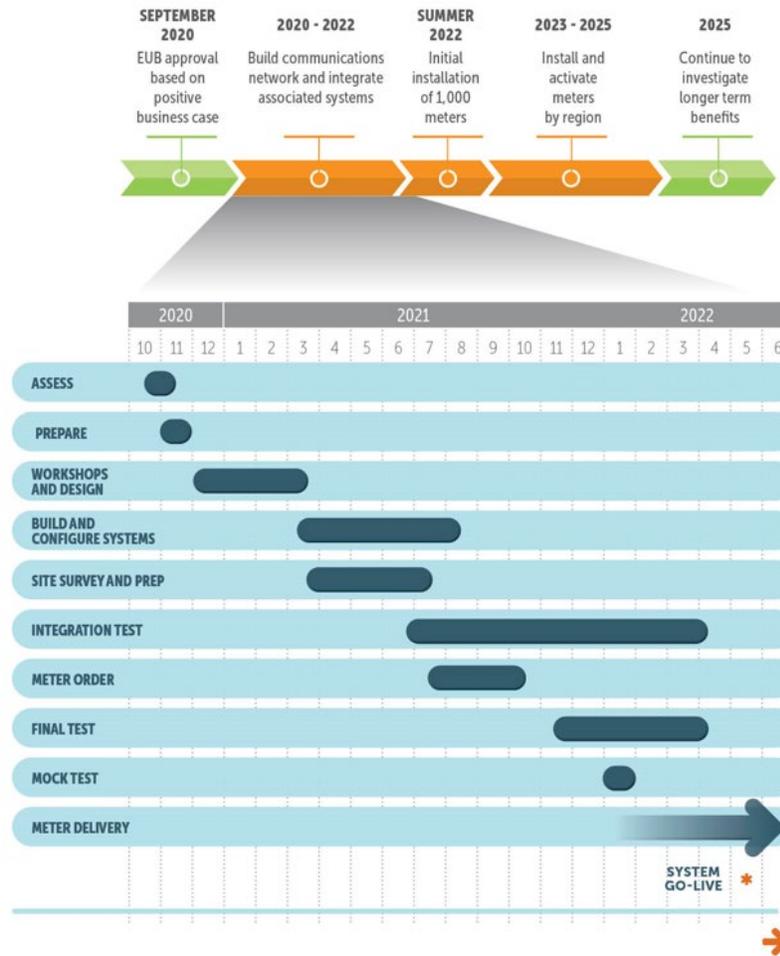
Objective

The objective of this report is to provide a quarterly status update to the NBEUB on the AMI Project. This includes progress indicators tracking the project roll-out, as well as its timeline, costs, and the realization of its quantified and non-quantified benefits, as compared to the AMI business case filed with the NBEUB in Matter 452. Updates on customer engagement and project risks are also provided in this report.

NB Power's AMI Project involves several key vendors to deliver on various aspects of the project, with NB Power project management providing oversight over the entirety of the project. The main vendors and their contributions are as follows:

- **Utegration** – experienced System Integrator providing technical oversight to the multiple elements requiring interfaces with NB Power's SAP enterprise asset management system and AMI related systems
- **Itron** - Meters and Head End System
- **Siemens EnergyIP** – Meter Data Management System
- **Olameter** – deployment of new meters across the province

Summary of Results as of Quarter ending June 30, 2022



Project Timeline

- Key activities in the last quarter focused on completion of end-to-end system integration testing followed by system integration.
- Network infrastructure deployment is on-going with 230 out of 259 Cisco Connected Grid Routers (CGRs) installed.
- The project team continuously monitors for internal or external challenges that could impact the project timeline and/or budget and ensures mitigation plans are in place. Mitigation actions have been utilized to minimize the impacts on schedule and costs; and to date cost impacts related to delays have been managed within the overall project budget.
- Preparation and planning work for meter deployment continues, which is dependent upon meter availability. The availability of meters is still being impacted by a shortage of semi-conductors, the on-going COVID shutdowns in Asia and the recent war in Ukraine, all of which are beyond our direct control.
- To maximize efficiency and to ensure customer benefits are realized, NB Power plans to begin mass meter deployment once a sufficient supply of meters to complete the upgrades

for the first area scheduled (about 120,000 meters) is available. We continue to pursue all avenues of resolution with Itron and other vendors to secure the meters as soon as possible and mitigate cost pressures.

- Based on the current forecast of meter shipments, mass deployment is now anticipated to begin in the spring of 2023, which is approximately one year later than the original plan.

Financial Results

The business case detailed the net present value of the lifecycle costs and benefits of AMI. NB Power will be reporting on AMI project costs presented in Matter 452 evidence, Table 2.3.1, lines 4-8. The sunk costs to the end of fiscal year 2018/19 will not be included because they were not included in the costs in the business case or Table 3.2. Table 2.3.1 has been restated below to break out the costs into the categories presented in Matter 452 evidence Table 3.2. This includes all costs incurred in fiscal year 2019/20 to the completion of system-wide coverage of AMI that remains dependent on the receipt of meters. The table below represents project costs incurred to date.

Costs	Actuals to date (\$M)	AMI Project Costs Budget (\$M)	% of Total
3.2.1 AMI Capital	\$5.9	\$53.3	11.1%
3.2.2 AMI Operating	0.3	5.9	5.1%
3.2.3 MDM Operating	1.3	2.9	45.2%
3.2.4 Meter Installation Capital	0.0	11.5	0.0%
3.2.5 CIS/WFM/ESB Capital	6.6	8.8	75%
3.2.6 MDM Capital and AMI Project Team	6.8	8.0	85.4%
3.2.7 CIS/WFM/ESB Operating	1.1	3.5	31.7%
3.2.8 Corp Services & Other Capital	1.8	3.1	58%
3.2.9 Utility Tax	0.0	0.0	0.0%
3.2.10 Corp Services & Other Ops	0.0	0.3	11.7%
3.2.11 Pre-Engineering Capital	0.1	0.1	90.9%
Total	\$23.9	\$97.2	24.6%

Note to Reader: Financial tables reflect differences due to rounding

Variance explanation:

- 3.2.1 AMI Capital – the bulk of this spending to date is for the installation of the network hardware. The remaining budget is related to the cost of the meters. Much of the spending will only start once mass deployment begins and will continue through the mass deployment period.
- 3.2.4 Meter Installation Capital – there will be minimal spending in this category until mass meter deployment begins.
- 3.2.5 CIS/WFM/ESB Capital – the work in this category is related to system integration, specifically the contract with Utegration. There are milestone payments due in July and then this contract will be complete. Due to COVID and travel restrictions this vendor worked remotely for the duration of the project except for two trips to New Brunswick. Although there were several change orders during the integration phase that added costs, the travel savings coupled with more favourable exchange rates than had been budgeted

will result in this contract being completed under the budgeted contingency.

- 3.2.6 MDM Capital and AMI Project Team covers the work to implement the MDM as well as the budget for the project team for the duration of the project. The current variance is driven by the fact that portions of the project team will remain in place until after meter deployment is complete.
- All other project spending is on track and aligned to the scheduled work. Approximately \$1.2 million in contingency related to system integration is forecasted to be spent by July 2022.
- To date there have been costs that would not have been anticipated at the time of the development of the AMI business case. NB Power has built a meter farm and there are also materials identified as required during meter installation which are net new. Also, as explained in other sections of the report, due to the current shortage of meter parts, NB Power will be stockpiling meters as they become available. This will ensure we have a critical number of meters before deployment begins, to avoid incurring unnecessary penalties from the meter installation company. There will be new storage costs associated with stockpiling meters. NB Power has also had to add approximately 15,000 additional meters to deployment due to the number of new builds in the province since the time the business case was developed. At the present time NB Power is forecasting that these additional costs can be covered within the 15 per cent contingency on variable costs that the EUB approved as part of their decision in Matter 458.

System Integration - Implementation Schedule

The system integration schedule includes six phases:

- **Assessment** – establish a level of understanding on implementation methodology, standard SAP solution, vendor and client culture, and potential gaps
- **Prepare** – mobilize project and team; lock-in project scope and expectations
- **Validate** – conduct design workshops and agree on design decisions, workflows and business processes to be implemented for the project
- **Realize** – solution build and configuration, integration testing, user acceptance testing, and final acceptance of system
- **Deploy** – establish business readiness and achieve systems go-live
- **Transform** – transition to steady-state production support and stabilized business operations



Update:

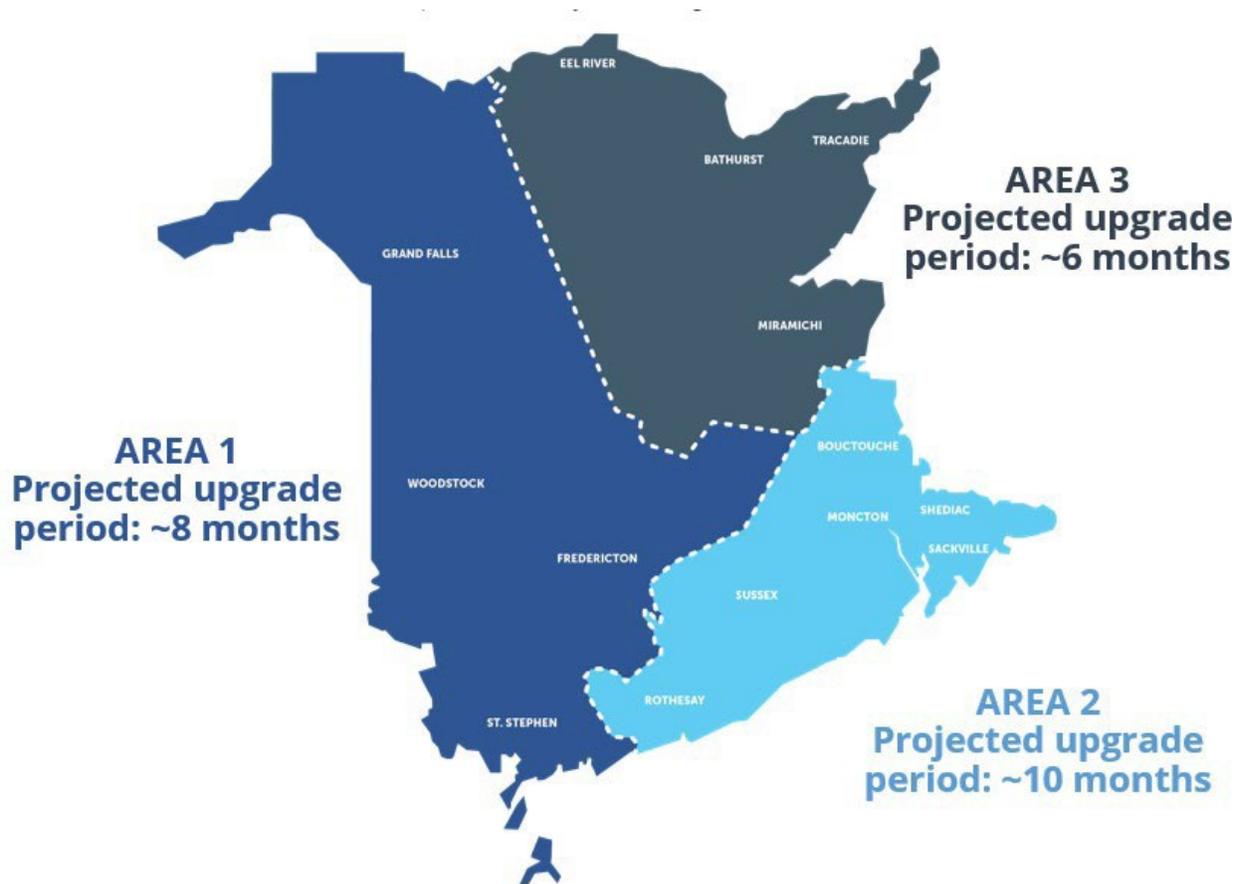
- User Acceptance Testing was completed in April 2022.
- System go-live was completed in May 2022.
- Between June and July ~1000 meters will be installed with customers in the Fredericton region to further test end-to-end system and validate our communications and overall experience plans with real customers.
- Due to the global shortage of semi-conductors impacting Itron’s ability to meet forecasted meter inventory, Mass Deployment has been delayed until the spring of 2023. We continue to monitor inventory and pursue all options to minimize costs and schedule impacts on Mass Deployment.
- With the delay of Mass Deployment, the team will be working on additional system enhancements, developing, and updating documentation to support the AMI processes, and taking lessons learned from initial rollout to revise the Mass Deployment plan.

Meter Deployment

- As part of the initial rollout, 800 of the 1000 meters have been installed in the Fredericton area to provide NB Power understanding of the functionality of the operational state of AMI systems including the end-to-end integrations and validation of the customer experience.
- The installation of three-phase transformer rated meter upgrades have begun and we have approximately 200 meters installed. These upgrades are taking place separately from mass deployment due to the complexity of installation and will take approximately 2 years to complete installations provincially.
- NB Power currently has 15,000 meters in inventory, which represents only 14% of our forecasted meter delivery plan. This is due to the global semiconductor shortage.
- Mass deployment of smart meters to NB Power customers is now scheduled to begin in spring of 2023, starting with Area 1 and concluding within a 24-month period. This is pending delivery of a sufficient quantity of meters and assumes no further delays due to the global semiconductor shortage.

Tentative Smart Meter Installation Map

This is based on initial plans and is subject to change.



Stakeholder Engagement

The customer communications and engagement strategy includes four phases as illustrated by the diagram below. NB Power is currently focused on the initial rollout which began this quarter and Phase 2 activities in preparation for full deployment. These activities include information sessions for employees, updates to key stakeholder groups, and providing information related to NB Power's grid modernization efforts through www.nbpower.com.

The initial rollout gives NB Power the opportunity to test and refine the stakeholder engagement and customer notification process to be implemented during full deployment. Upon completion of most planned installations for the initial rollout, customers will be surveyed to test their satisfaction with the notification and installation processes. In addition, surveys will be conducted at the beginning of deployment and every six months thereafter to measure awareness and acceptance and test effectiveness of messaging and communications.



- Equip employees appropriately for questions and conversations
 - Build foundational assets
 - Tell the “Building a Smarter Grid” story
 - Proactively engage with stakeholders
- Effectively communicate EUB decision
 - Increase customer education and awareness of smart meters & benefits
 - Create and deliver compelling marketing communications tools & tactics
- Effectively communicate install logistics
 - Target opt-outs <2%
 - Achieve wide customer acceptance and understanding
- Customer leveraging technology (as it becomes available)
 - Promoting engagement through active story telling
 - Encourage sharing of customer experiences

Update:

- Communication activity in this quarter focused on preparing for the initial rollout. One objective of this rollout is to test customer communication protocols to ensure customers understand what to expect during installation. Customers scheduled for a smart meter upgrade received the following three notifications:
 - An email or letter with brochure highlighting the benefits of smart meters
 - A postcard to remind the customer that a meter installer would be onsite in the coming weeks
 - A dialer call reminder to inform customers that their meter would be upgraded in the next few days
 - After installation, a door hanger was left at the customer's home to confirm the upgrade took place
- The material referred customers to NBPower.com for more information.
- Customer-facing employees were provided with training and materials necessary to support

customers during the initial rollout and respond to questions.

Following is a summary of the stakeholder outreach activities conducted between April 1, 2022 and June 30, 2022.

- Fredericton-area provincial, municipal and federal government stakeholders were notified via phone and email about the initial rollout prior to customer notifications.
- Representatives from the IBEW were also notified.
- An update was provided at Community Liaison Community meetings conducted for the Milltown Generating Station, Lower Saint John River Hydro and Belledune/Dalhousie.
- AMI and smart grid information were provided at three home show events held in the quarter in Saint John, Caraquet, and Fredericton.
- Internally, the AMI project team conducted monthly updates for employees working in areas of the business affected by AMI. News and information are also provided regularly to all employees.
- There were 1,050 visits to the smart meter section of the website, an increase of about 13% over the previous quarter.

Risks

NB Power’s Enterprise Risk Management framework and process takes a strategic view of risk in all aspects of business management and is applied consistently at the strategic, business unit, program and project level. NB Power manages risks, within its risk tolerance, consistently and comprehensively through a continuous, proactive and dynamic process that identifies, understands, manages and communicates risks that may impact NB Power’s strategic goals.

The following risks have been identified as items specific to the success of the overall AMI Project and are monitored and reported on monthly to the Strategic Portfolio Management – Executive Oversight Committee which is comprised of NB Power senior leadership including members of the executive team.

#	Risk		Mitigation Activity
1	Clear roles and responsibilities between NBP and multiple vendors	G ↑	Risk is now closed as roles and responsibilities have been managed. Vendors have delivered on their scope of work. A new risk will be added on the next report related to the outstanding non-production software deployments from the Head-End System vendor.
2	Adequate resourcing	Y ↑	All staffing requests have been filled or in the process of being filled. Positions and time commitments have been extended to finalize outstanding documentations.

3	Deliver timely customer benefits	○ ↑	<p>Monitoring alignment of benefits as committed to project plan execution; impacts of scope requirements coupled with global supply issue being analyzed and evaluated, including meetings with senior managers from the related vendors.</p> <p>a. Global semiconductor shortage – due to the high demand for microchips and semiconductors, the risk associated with the confident supply of meters as planned during the project is being monitored and discussed at senior levels with the key vendor to determine the best course of action to mitigate risk to NB Power and its customers.</p>
---	----------------------------------	--------	---

Legend for Risk Indicator Results		
Green	Potential impact and/or probability of the risk occurring is low. Issues that have arisen or may arise are considered manageable in the normal course of operations.	≤ 59% of Key Risk Indicator targets are occurring
Yellow	Potential impact and/or probability of the risk occurring is medium. Issues have surfaced or remain present requiring focus.	≥ 60% of Key Risk Indicator targets are occurring
Orange	Potential impact and/or probability of the risk occurring is high. Serious issues exist which require close senior management attention.	≥ 75% of Key Risk Indicator targets are occurring
Red	Potential impact and/or probability of the risk occurring is very high or critical. Serious issues exist which require immediate senior management attention.	≥ 85% of Key Risk Indicator targets are occurring

Trend Indicator Legend					
↑	Significance is increasing	↔	Remaining the same	↓	Significance is decreasing

Update:

- Concerns regarding activities that have the potential to impact the project schedule and/or budget continue to be escalated to the appropriate vendor and management level.
- Implementation risks and issues are identified and managed weekly amongst the project team participants.
- Action plans for each of the above-noted risks are reviewed and updated monthly.
- A global supply issue related to the availability of semiconductors impacts the availability of meters to align to the current project plan. This risk has been analyzed and is monitored weekly to understand the impact and to consider options to mitigate the risk to the project.
- NB Power Management continues to review and discuss potential meter surcharges due to increasing costs identified by Itron. NB Power Management are reviewing options to mitigate the potential of increased costs, while balancing the need to ensure a sufficient supply of meters is secured for deployment.

Quantified Benefits Realized

The following table represents the benefits of AMI that were accepted by the Board in the decision of Matter 452. The majority of these benefits will be realized post full deployment of AMI.

The benefits are shown in present value and real dollars to provide a correlation between the accepted present value in the decision and the real dollar value that is targeted that NB Power will be tracking against over the life of the AMI meters.

Benefit	(PV \$ millions)	Target (Real \$ millions)	Actual	% Realized
Reduced Manual Meter Reading and Meter Service Order Benefits	39.9	65.9		
Avoided Cost of Meter Replacements	22.0	35.4		
Conservation Voltage Reduction	16.2	25.7		
Distribution Network Losses	15.0	25		
High Bill Alert	10.3	17.1		
Load Research Meters	5.2	8.5		
Net Metering	4.3	8.0		
Meter Services Manager Salary	1.8	3.0	0.3	10%
Avoided Cost of Meter Reading Vehicles	1.8	2.8		
Outage Restoration (Crew Management)	1.6	2.6		
Reduced Customer Inquiries	1.4	2.4		
Avoided Cost of Handheld System	1.4	2.2		
Avoided Cost of Meter Reading Supervisor	1.0	1.6		
Reduced Overtime for Meter Service Orders	0.6	1.0		
Total Benefits	\$122.4	\$201.1		

Update:

All benefits will be realized post implementation of the smart meters except for the Meter Services Manager Salary. NB Power began realizing this benefit in fiscal year 2020/21 when the position was eliminated.

Non-quantified Benefits

Non-quantified benefits will be measured and reported as they are realized throughout the meters' lifetime. Currently there is nothing to report.

AMI PROJECT UPDATE

Period Ending June 30, 2022



Énergie NB Power

| the power of possibility
| débordant d'énergie