

Testing and Proving Energy Storage  
on an Industrial Scale



Prince Edward Island  
Canada

# CITY OF SUMMERSIDE CREDIT UNION PLACE – SMART STORAGE DEMONSTRATION PROJECT

## Built under the City of Summerside Living Lab Platform

Summerside is a municipality that is recognized as a leader in Renewable Energy, Innovation and Entrepreneurial Drive in the pursuit of advancing economic development. Summerside and Samsung Renewable Energy partnered back in 2017 to form a long-term alliance to further opportunities in the green sector to advance renewable energy initiatives, to advance innovation and economic development and to drive efficiencies into municipal operations that, if proven, could be replicated across Canada. In late 2017, this unique partnership deployed a first in the world, behind the meter Solar and Battery Storage system designed to prove and achieve very defined outcomes, and most importantly to validate and scale up industrial scale storage in a way that integrates versus disrupts day to day operations of utilities and facilities in a municipality.

Storing energy is not new for small applications, but is in its infancy when ramped up to an industrial scale. The boom in the renewable market over the past ten years has seen Canada become one of the most successful countries adopting renewable energy into its grid system, however many barriers still exist in making renewable mainstream in today's energy infrastructure, and a main outcome of this project was to break those barriers down.

Approximately 19% of Canada's energy supply is now derived from renewable energy resource. The City of Summerside in Prince Edward Island has already procured more than 45% of its load from renewable sources. In partnership with Samsung Renewable Energy Inc., the City of Summerside is now building a smart energy storage system, integrating the city's solar power with other renewable power and conventional energy sources.





A further outcome of this ambitious green project is to help Summerside meet its increasing electricity demand while saving on energy costs, reducing carbon emissions, creating jobs and building green tech expertise in the region. The project partners also believed from the outset that this system and the lessons learned can and should serve as a model for other communities in North America wishing to collaborate with multiple partners to achieve long-term energy cost savings and environmental benefits and that Summerside could play a key role in sharing those lessons and experiences.

Located at Credit Union Place in the City of Summerside, the smart energy storage system blends solar power with traditional power sources and provides a cost-effective way of storing and dispatching surplus energy. Why Credit Union Place? Simply put, every city in North America has large public buildings and specifically recreational complexes that serve as anchors for sport and social activities, have significant and diverse energy patterns and are challenged to constantly find ways to drive economies of scale into their operations to maintain market parity in their costs of service.

This project represents the evolution of the city's green tech investment strategy. It has been developed to provide a platform for energy security, encourage energy conservation, and bring cleaner renewable energy onto a smarter electricity grid. The ultimate goal is to assist Summerside business growth, innovation and export development so that the city can create meaningful quality jobs and wealth as well as cost efficiencies for municipal operations. Equally important, the project is to be a showcase for other jurisdictions globally to illustrate how innovation and partnerships between large scale public and private facilities can work to further incorporate technology to drive efficiencies.

From a utility standpoint, this project was developed to demonstrate a new alternative approach to costly grid infrastructure capital investment by integrating at-source storage and demand/supply management. Fundamentally, this project, from a utility lens, illustrates how utilities can integrate storage solutions that are modular, impactful, responsive and green, while benefiting the utility grid operator, the customer and the environment.

## **Specifically, the genesis of this project was to demonstrate:**

- ✓ Integration of renewables and traditional power sources (solar, wind, downstream technologies)
- ✓ Storage of wind, solar and other energy generation
- ✓ Grid integration management
- ✓ Peak shaving
- ✓ Back-up green energy
- ✓ Back-up battery storage.
- ✓ Grid-connected battery storage



And the results from the past 17 months have exceeded the expectations of those initial goals not only financially but operationally and educationally and have further instilled our belief and determination that scaling up renewables and storage is both a responsible and cost-effective future path for utilities and municipalities globally.

The System itself consists of 1,404 ground-mounted panels and 144 carport panels engineered to produce a yearly output of 603,800 kWh. The solar panels are expected to offset greenhouse gas emissions (GHG) from the electrical grid by 181 metric tons of carbon dioxide per year and the direct economic savings are targeted to achieve \$60,000 per year in energy and demand charges.

In addition, the Lithium ion battery technology was designed to store 890 kWh of electricity with a 250 kW power transfer system. This system was built to shift the building's energy use from on-peak to off-peak by a volume of 324,850 kWh per year. Energy shifting is projected to save an additional 50 tonnes of carbon dioxide per year by eliminating the need for peaking units for diesel or natural gas.



## Collectively, the four pillars of the systems were designed and engineered to meet industrial scale objectives:

### Battery

Backup Generation — Replace Conventional Diesel  
Peak Shaving — Reduce Customer Demand  
Energy Shifting — Use Energy when Best  
Regulation — Use for solar instability causes

### Integration

Utilization of best battery / solar components for three stakeholders — the Utility, the Consumer/ Customer and the Environment

### Solar

Exacting Data for PEI — Industrial Scale Proof of data — for energy production  
Demonstration of removing barriers — collaboration between utilities and end users on an industrial scale

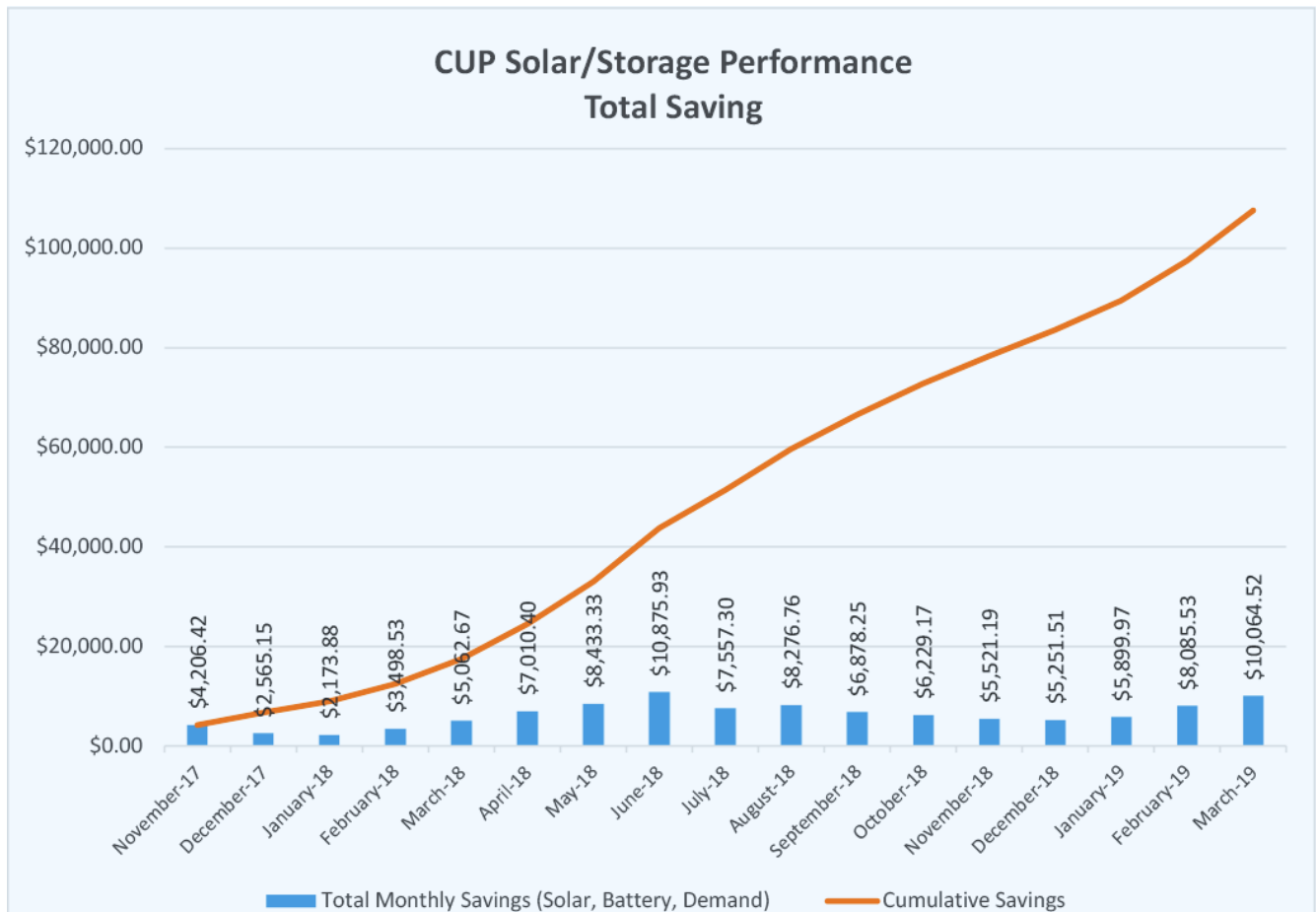
### Research

Remote Community and Recreational Facility  
Use Utility solutions for integration to distribution

# Inside the Numbers

Since commissioning in 2017 and having 17 months under operation the system has met and exceeded our expectations on a number of fronts including financially, system performance and proof of concept. One of the main resultants of the project to date has been from operational engagement of facilities operators who have seen the value and role innovation can play in running large scale facilities. This partnership had some very defined objectives with this experimental industrial scale project as initially laid out in our project charter overview (<http://www.bigpossibilities.ca/assets/uploads/multimedia/files/brochures/SSD.pdf>).

## Total Cumulative Savings: **\$107,590 (17 months)**



# The Results Speak for Themselves

While the metrics of the project go far beyond the financial savings, what we have achieved has exceeded our expectations in terms of partnership, innovation and driving efficiencies into our daily service offerings.

- The solar farm component has been active since October 2017 and realized savings for solar production have exceeded our modelled savings projections. The month of March was one of our highest production month with generation of over \$6,600 in savings and production of over 59,000 kWh's.
- For the month of March, the CUP storage Project has saved demand charges of over \$3,360 and has reduced GHG allowing Summerside to invest those savings directly back into recreational programming.
- For the month of March, Credit Union Place saved combined energy costs of over \$10,000.

**So, what does this all mean?** Since commissioning, in addition to knowledge gains, the addition of renewable integration into our grid and our community has saved over \$107,000 in energy costs, allowing us to invest that savings directly back into core services.

**To learn more about our project visit:**

<http://www.bigpossibilities.ca/assets/uploads/multimedia/files/brochures/SSD.pdf>

**Or learn about our Living Lab Program at:**

<http://www.bigpossibilities.ca/living-lab>

**To learn more about Smart Storage Solutions and how you can integrate your own system, contact:**

**Michael Thususka**

Director of Economic Development  
City of Summerside

275 Fitzroy Street  
Summerside PE C1N 1H9  
M: 902.432.0103  
E: [mike@summerside.ca](mailto:mike@summerside.ca)  
W: [www.bigpossibilities.ca](http://www.bigpossibilities.ca)

