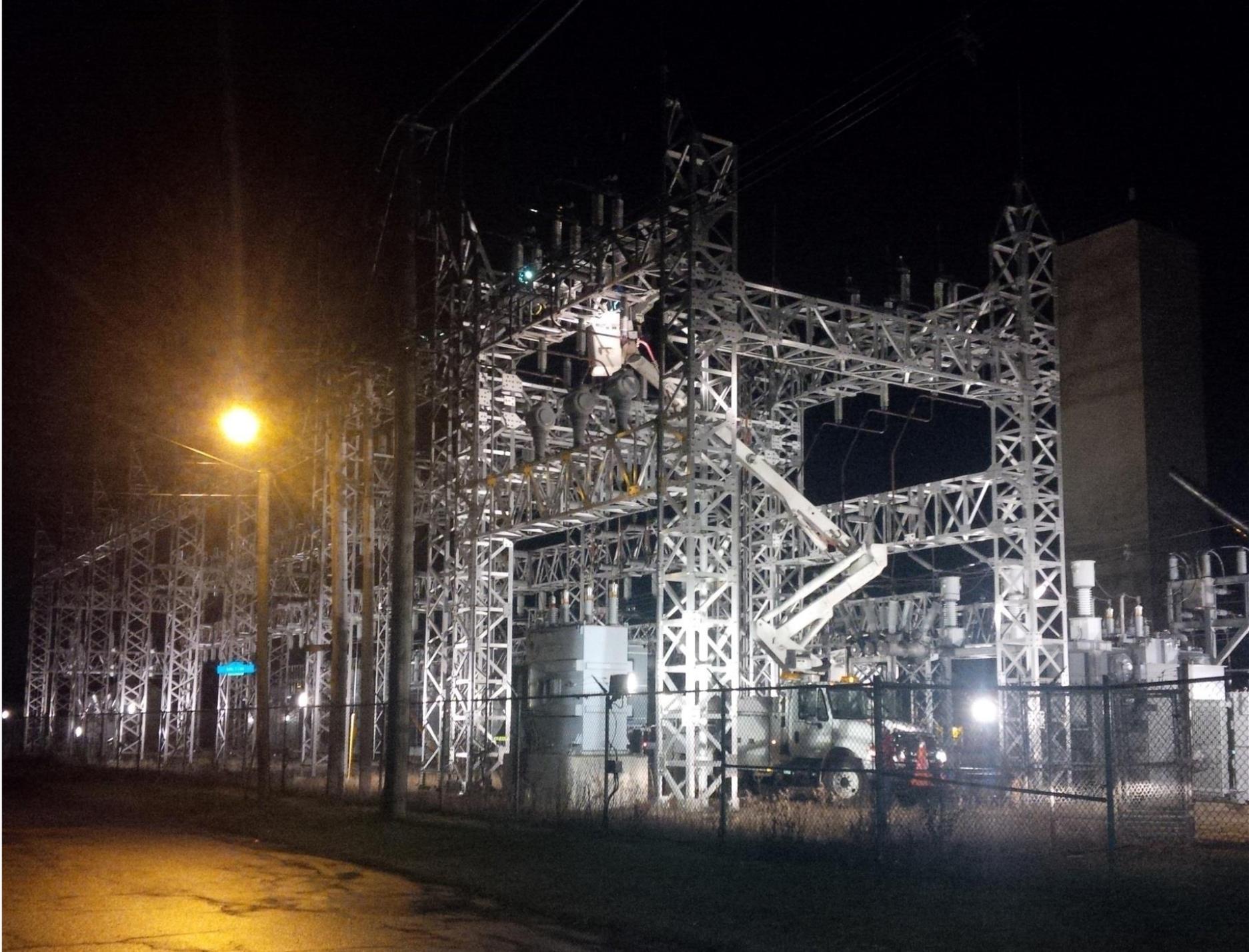


# Renewable Energy Quest

City of  
*Summerside*  
Electric





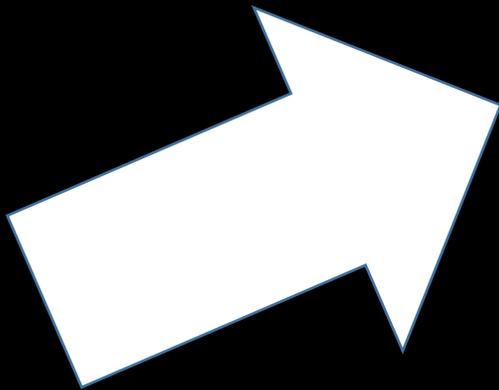
City of  
*Summerside*

in.termi...ten...cy



in.termit...ten...cy



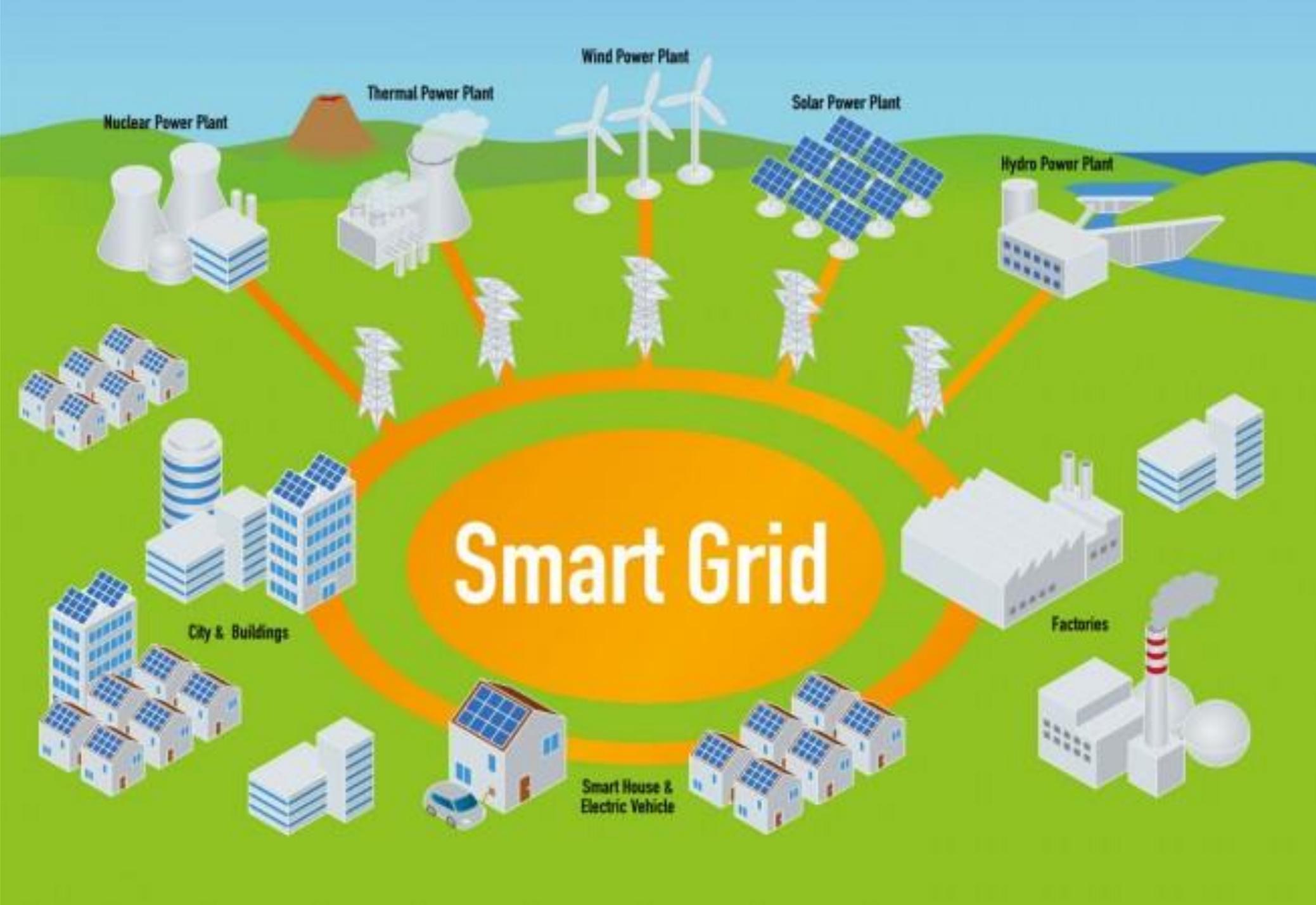




≠



It ain't so simple: Complexity





Benefits



Lower rates



Greener Choices



Reduced  
Greenhouse Gases



Local Control



Investing in our  
community

# YOUR DAILY USAGE

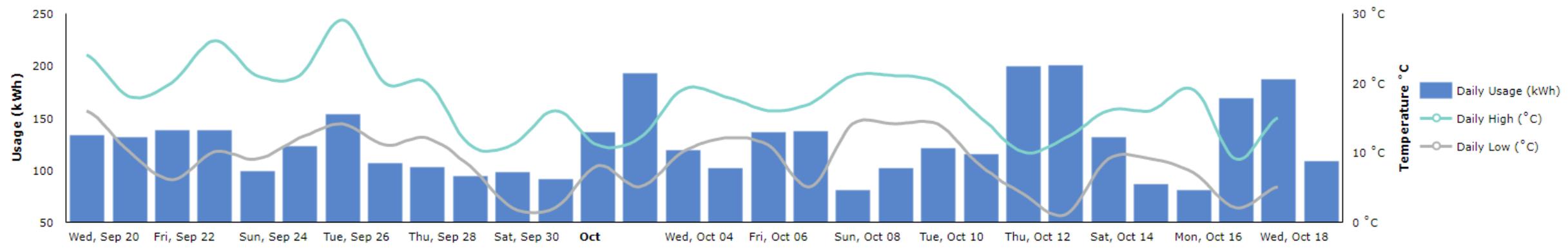
- Home
- Settings
- Mobile
- Account
- Calendar
- Help
- Logout

Download My Data

Date Range  
09/20/2017 - 10/19/2017

Account  
10001-36097, 75 Spring St

Meter  
11232



My Consumption 3,809 kWh	My GHG Footprint 1,752 kg	My GHG Reduction Vs. Propane 4,000 kg	My GHG Reduction Vs. Oil 8,533 kg
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## HEAT FOR LESS NOW DEVICES

Room Heater 12345678 0% 0 kWh Stored	Water Heater 123456 0% 0 kWh Stored	Water Heater 0211W30470 18% 4 kWh Stored
Water Heater 0111W27693 0% 0 kWh Stored	Room Heater 101112560091654SSH 3% 0 kWh Stored	Furnace 209115337016161SHH 28% 36 kWh Stored
Furnace 206125224016379SHH 27% 24 kWh Stored	Water Heater 0211W29164 17% 3 kWh Stored	Furnace 206124224016380SHH 29% 27 kWh Stored
Room Heater 101112560091655SSH 34% 9 kWh Stored	Water Heater 0111W26916 18% 3 kWh Stored	Furnace 207145438016864SHT 7% 9 kWh Stored
Water Heater 0213W31699 18% 3 kWh Stored	Water Heater 0211W29169 18% 3 kWh Stored	

# Capturing Wind with Thermal Energy Storage – Summerside’s Smart Grid Approach

Steven Wong, *Member, IEEE*, Greg Gaudet, and Louis-Philippe Proulx

**Abstract**—The City of Summerside, PE, Canada, has 21 MW of wind capacity from which it meets almost half of its electric energy demand. At times, wind power exceeds what is needed locally. To avoid exporting the excess wind to the bulk grid at unfavourable prices, an innovative smart grid program for active control of thermal energy storage systems has been designed and implemented. On the utility-side, fibre has been wired through multiple feeders to coordinate real-time control of load. On the client-side, consumers are incentivized to install ToU or real-time controlled electric thermal storage or water heater units in place of oil appliances. To quantify program impacts, a system model is created for simulating many what-if scenarios using system data from 2013 to 2015. It is found that there are compelling, measurable benefits to utility and consumer finances, GHG emissions, and wind integration with little negative impact

## A. Thermal Energy Storage

Thermal energy storage systems (TES) are devices that store energy as heat for later use in mediums such as water, ceramics, and rocks. Classification, design, application, and evaluation of TES in building applications are thoroughly explored in [1], [2]. The DR potential of various TES systems are explored in a German context in [3]; it finds that devices intrinsic to households (e.g., heating/ventilation and refrigeration) can be used for peak shaving but are not suitable for balancing wind variability, for which dedicated TES is needed. Related to TES are thermostatically controlled loads (such as air conditioners), which can provide DR through temperature



City of  
*Summerside*  
Electric



SAMSUNG RENEWABLE ENERGY INC.



Renewables Penetration (46%)



Wellness Centre electricity costs



Greenhouse Gases



Carbon Tax Immunity

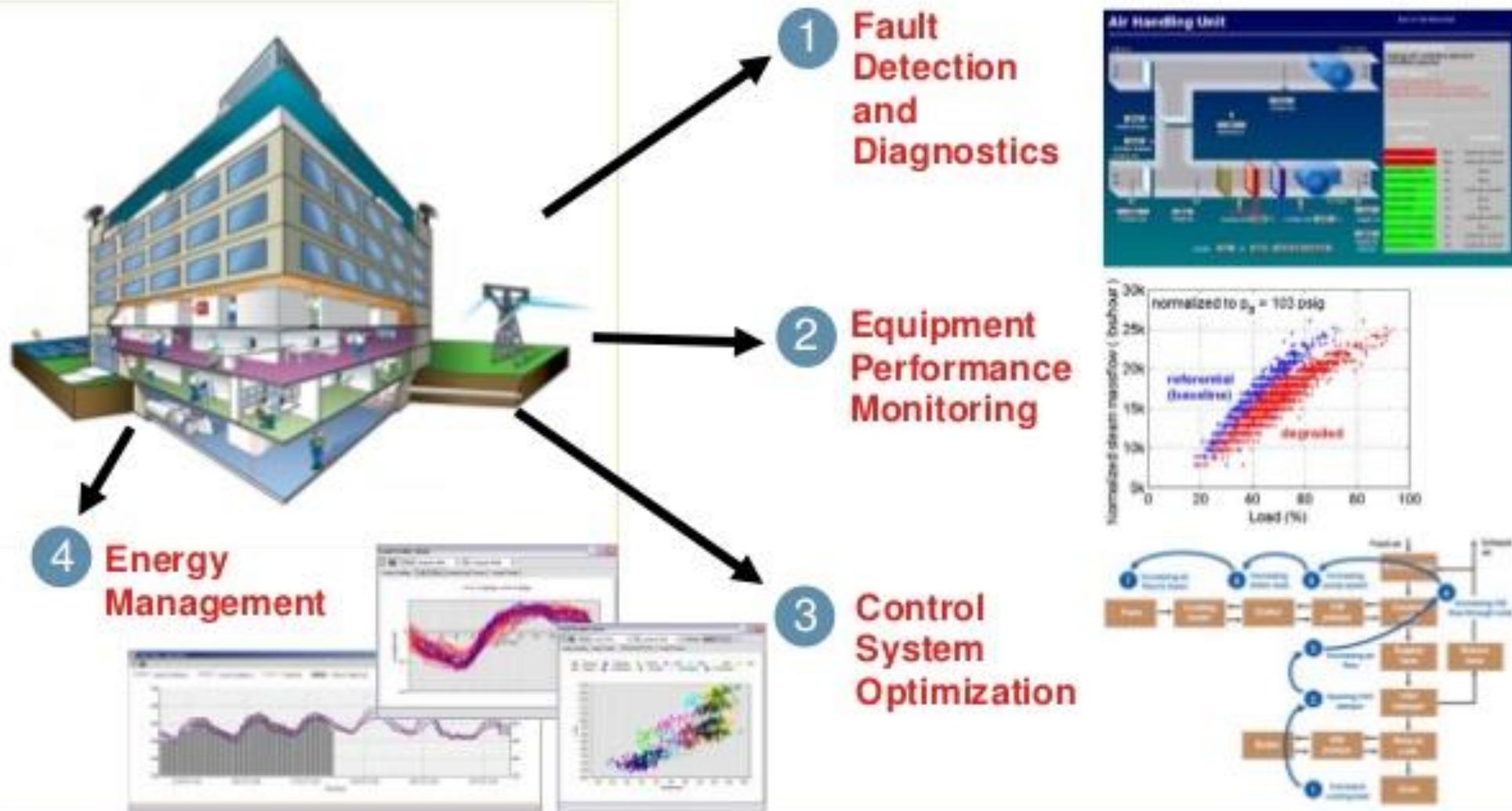




R  
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E



## Building Optimization Analytics



*...to Next Generation Energy Optimization*

# SHIP (Smarter Homes Incentive Program)

LED Street Lights

Smart Meters

Fiber connectivity to the Summerside Grid

Car Chargers

Rebates for Heat for Less (Thermal Storage)

Consultations on Smart Homes



# If you install them, will they come?



Catherine McKenna, Environment and Climate Change Minister





Celebrating 10 Years

**GREEN  
COMMUTE  
CLUB**



# Nourish Next-Gen Renewable Quests

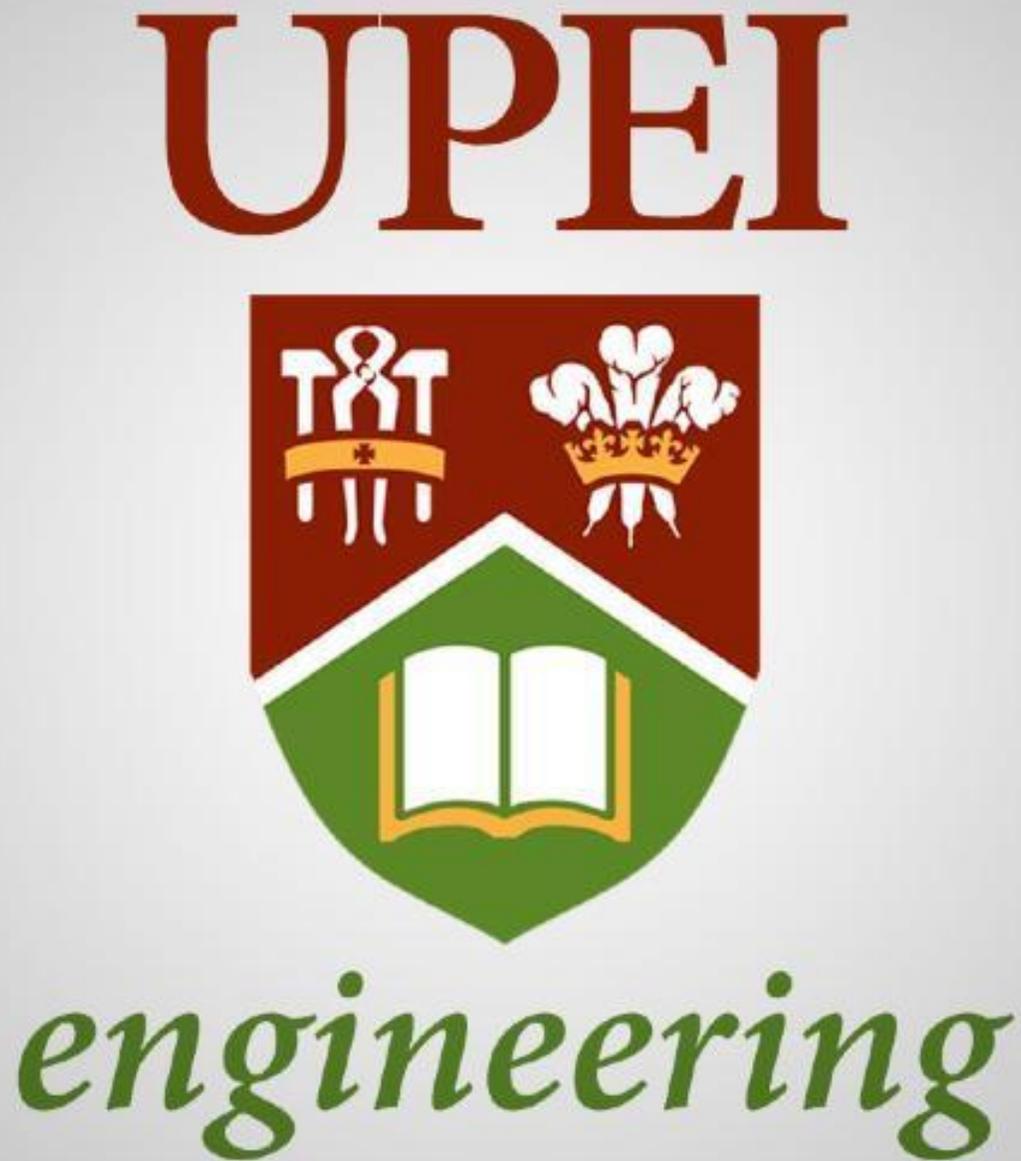


**LIVING LAB**

City of Summerside  
Prince Edward Island

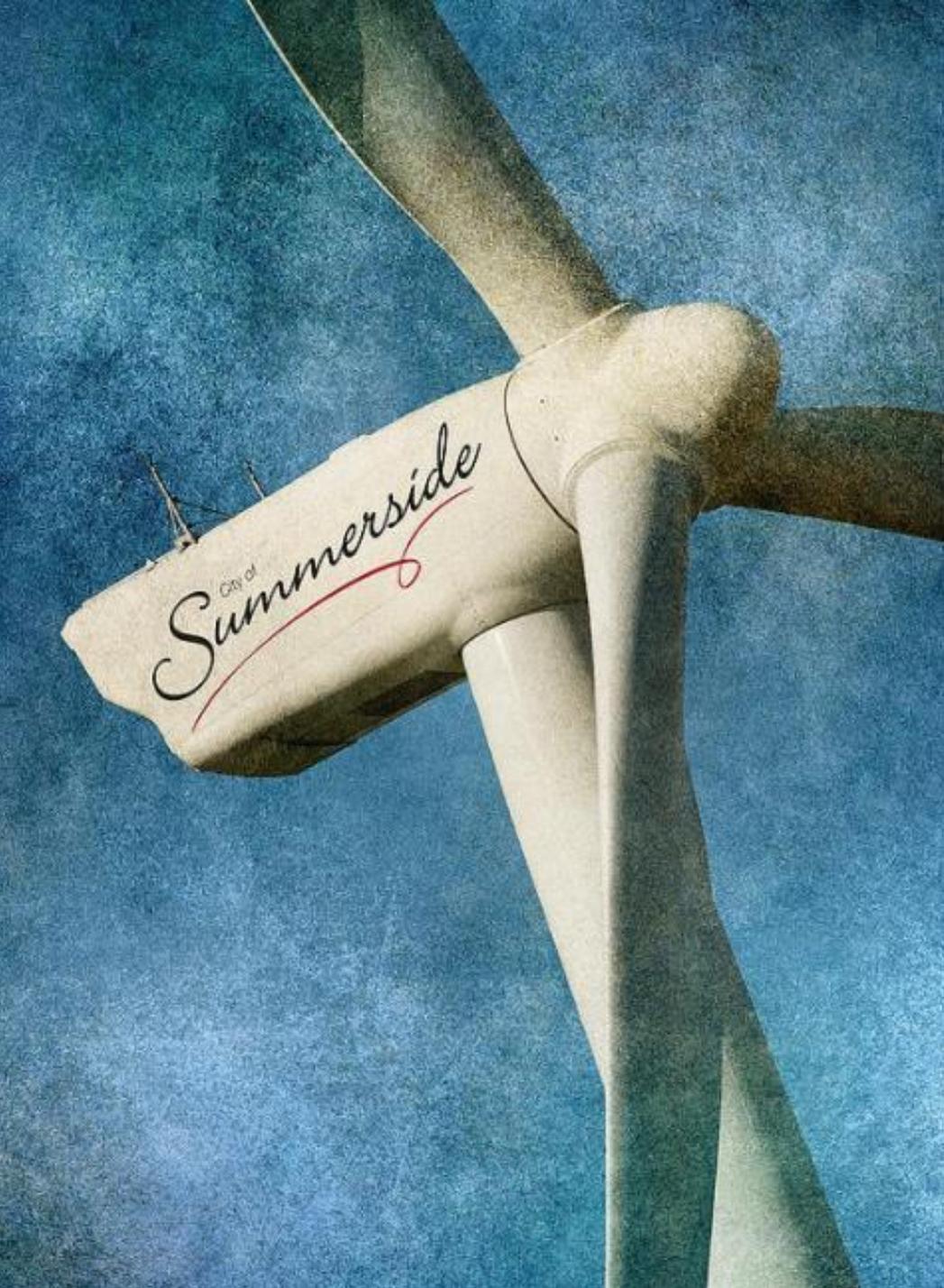
Daniel, Jordan & Erik – UNB Engineering Students

# Nourish Next-Gen Renewable Quests



...and next-next gen





# Renewable Energy Quest

# Confounds, Variables and Biases



- Community-owned electric utilities extremely uncommon in Canada
  - Regulatory regimes do NOT favor distributed electrical generation/distribution
- Public policy shops emaciated at all levels of government over last 30 years
  - Supplanted by independent think tanks (independent, but unbiased? Hmmm)
- Public policy slow-footed uptake of behavioral/cognitive sciences to catalyze change
- Electric utility industry driven by conservative values—ROI trumps public good
- Luxuries of North American “bigness” hard to give up—historical frontier culture
  - E.g. big houses, big spaces, big cars, big super-highways, big suburbs, big consumption, big oil, all contributing to big carbon