

City of
Summerside

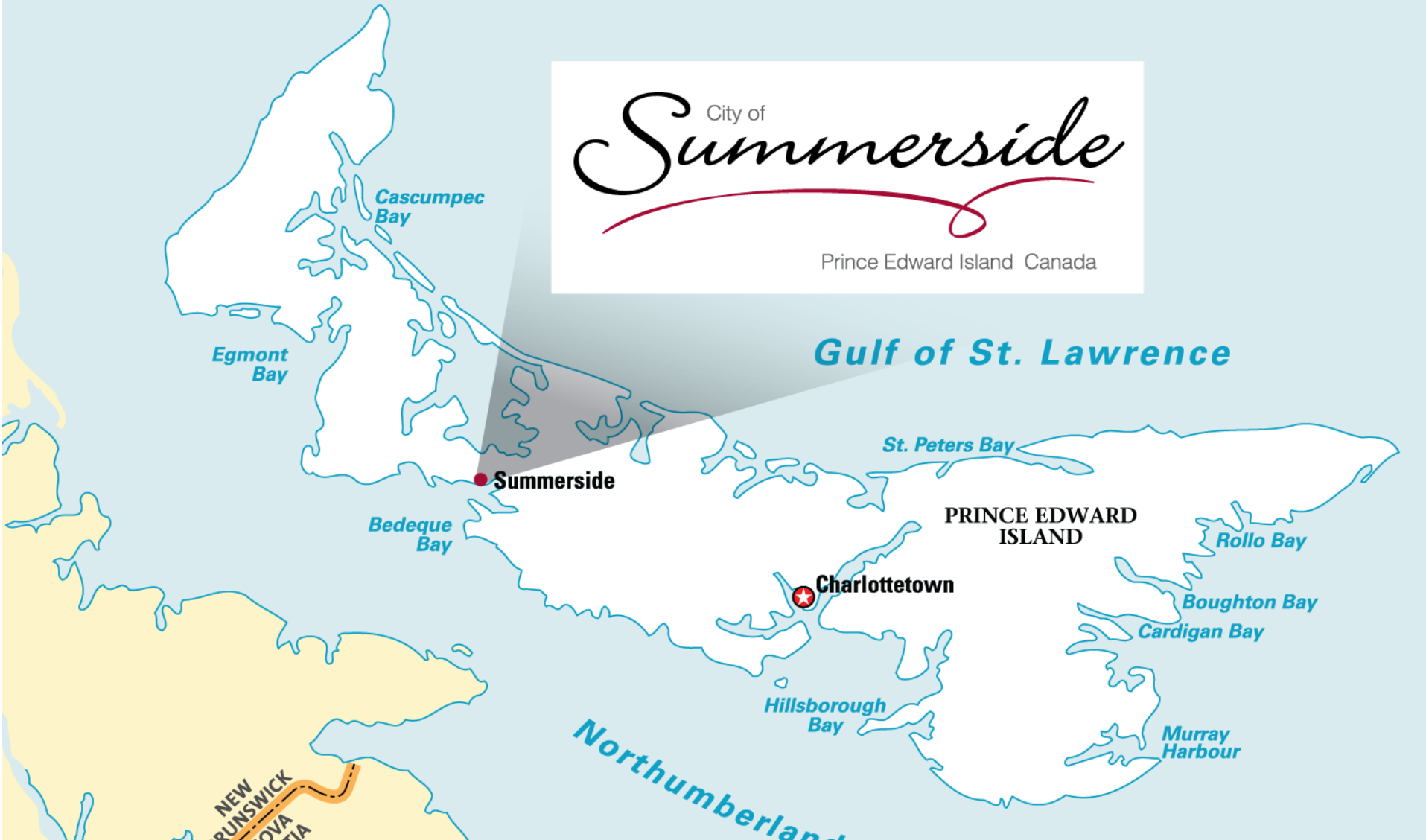
Prince Edward Island, Canada



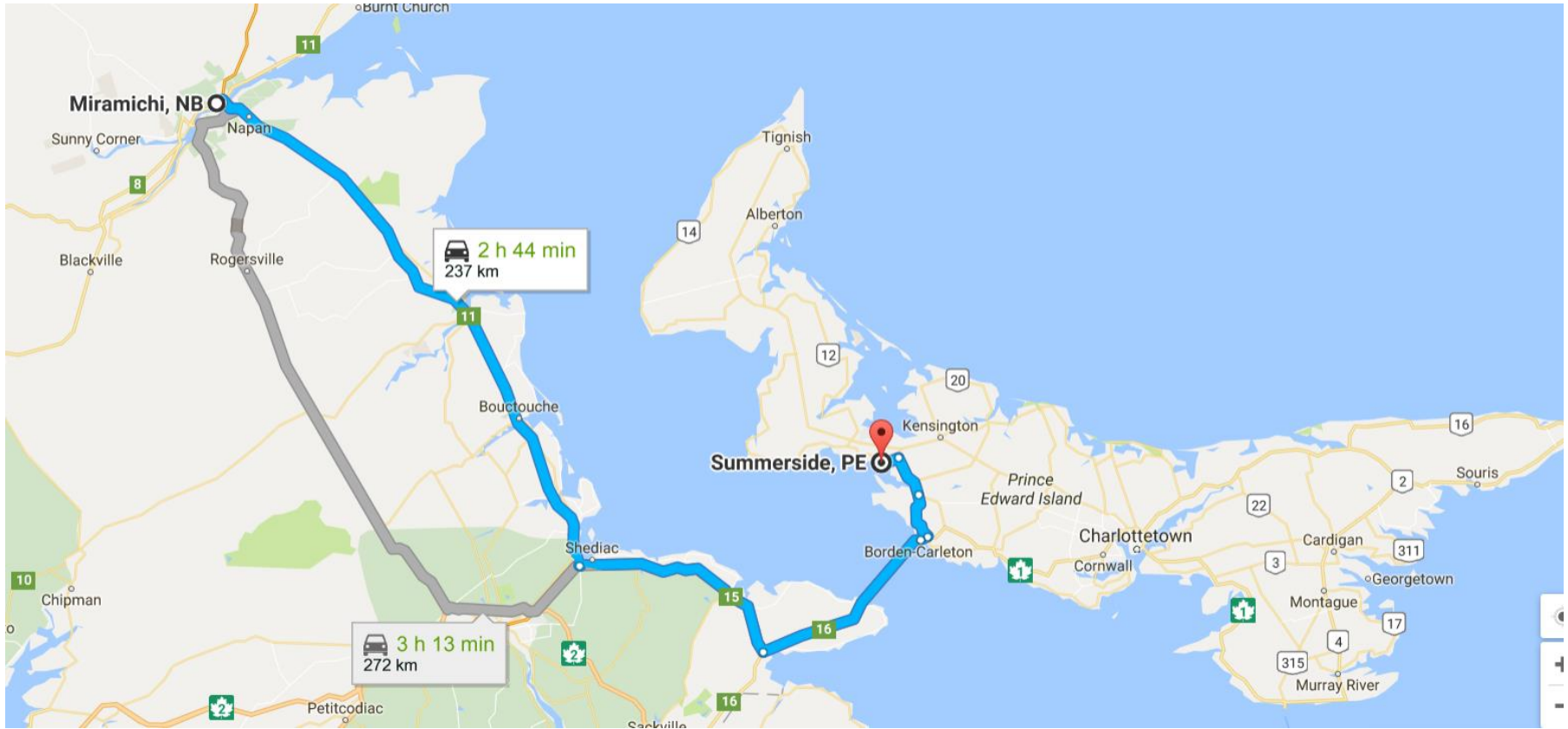
City of
Summerside

Prince Edward Island Canada

Gulf of St. Lawrence



How to Get to Summerside



City of
Summerside

Prince Edward Island, Canada



Perspective

Plan
Import
Produce
Export
Purchase
Transmit
Distribute

Plan
Import
Produce
Export
Purchase
Transmit
Distribute



Plan
Import
Produce
Export
Purchase
Transmit
Distribute



Our Electric Utility

The City of Summerside PEI Operates a Municipal, Community Owned Electric Utility: Summerside Electric

- Serving 7,000 customers
- Annual energy sales of 143 Million kWh's
- Purchase, Produce, Transmit, Distribute
- Regulated by Municipal Council
- Operating since 1920
- 23 employees (Utility)
- 150 employees (Municipal)
- Revenue of \$21,000,000



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Prince Edward Island, Canada

Energy Sources

Electricity on P.E.I. comes from a combination of Local Wind Energy and Generation in Neighboring Provinces and Transmitted Undersea

- No Hydro Electricity, No Natural Gas (trucked in), No Nuclear
- Most Homes Heated by Imported Fossil Fuels & Electricity



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Summerside Electric Facts



Peak Load 27 MW
Total Wind Energy available to City 21 MW
% of surplus wind sold outside City 3% (was 15%)

Source	MWh (2015)
Diesel Plant	1,000
Import Power	76,200
Wind	65,800
Totals	143,000

In last 3 years the City has averaged 20% of the time being powered by 100% renewable energy.

Summerside has the highest percent of wind integration for a utility in North America at 46%.

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Energy Programs

Change is in the wind.

Introducing MyPowerNet.
Empowering the people of Summerside to save money and help the environment.

MyPowerNet from the City of Summerside is a revolutionary program that saves YOU money, reduces our impact on the environment, and helps local business grow and create jobs. It's simple! Powered by our award-winning 12-megawatt wind farm, the savings come from Summerside homes and businesses using state-of-the-art ETS (electric thermal storage) furnaces, room heaters and water heaters which use electricity at a reduced night-time rate! All of which enhances Summerside's reputation as an innovator and great place to live. And every dollar goes back into making Summerside the best place on the island to live, work, and grow!

"The ETS room heaters are fantastic; it's great to get discounted electricity and help the environment too."
Scott & Corinne Costain, owners Scotcor Rentals

"My ETS water heater is great... environmentally friendly and much more economical than I ever imagined!"
Kathleen Kelly, homeowner

- Cost Savings** to you in the form of **reduced electrical rates**
- Decreased dependence** on escalating oil prices
- Minimized carbon footprint** through the use of clean, locally produced renewable energy

Summerside The Living Lab

The City of Summerside and private interest are working together to envision, develop, and deploy technologies in real-life contexts for the betterment of the community and environment.

What is a Living Lab?

It's a platform for industry to collaborate with government to explore real-world issues and demonstrate how innovation can provide solutions.

A Living Lab is a new model; one that is defined differently around the world.

For Summerside, the model will help establish a culture of innovation and entrepreneurship that will benefit the community now and in the future.

and why that model?

- to gain access to knowledge in the community and better understand its needs
- to be inclusive and open about how technology can be introduced to encourage positive change
- to capture ideas and input from a larger population and evaluate how technology impacts that every day

Current Projects

Summerside and Partners are committed to advancing opportunities to assist in furthering the market potential for their initiatives.

Eco Business Park

There is a growing corporate responsibility to operate in a sustainable way. We are trying to create a sustainable business park targeted at those environmentally conscious businesses. The Eco-Park will offer wind-generated electricity, on-site storm-water retention and energy storage, access solar heat gain and natural day lighting, site recycling programs and more.

EV/Car Sharing

Summerside is developing an all-electric vehicle share program where the vehicle is the vessel that provides transportation but is also a repository for energy storage, an energy producer and innovative application device for future advancements.

Fibre to the Home

The City of Summerside is deploying full fibre to the premise solution to leverage the power of technology and provide, through our Electrical Infrastructure Network a pipeline to each premise in Summerside. This bi-directional communications network between the customer-end's smart devices and the electricity provider will be an open network allowing for multiple solution providers to leverage this infrastructure.

Power Storage

Through our PowerNet program Summerside Electric has begun addressing the problem of energy storage solutions by encouraging residential use of electric thermal storage (ETS) units. ETS units use high-density ceramic bricks to store heat given off by elements inside the units. The elements come on during the off-peak nighttime to heat up the bricks, and then the stored heat is released throughout the peak day time periods as needed.

Pollution Control

Summerside's Tertiary Treatment Facility is one of the most advanced plants in Atlantic Canada. Through the advanced technology and research capabilities, Summerside is the only plant in Atlantic Canada that removes 85 per cent of solids from the water to produce grade-A fertilizer.

Testing Assumptions

The culture we establish will open the door for many different opportunities. Summerside recognizes that there are numerous avenues to explore and many different applications that can be born out of this environment. Assisting the development process by enabling participants with our unique infrastructure is just one way we envision turning concepts into reality. Potential applications are endless but a few that resonate in Summerside based on existing priorities and key treatments are:

- Security and surveillance, Appliance Control, Residential Environmental Controls, Centralized Smoke/Carbon Monoxide Detection, Integrating other utility functions, Enhanced Emergency Services, Patient Connectivity to Medical Services, Virtual care from Doctors, Solar Energy Integration, Bio Fuel from Waste, Advanced IT Development, Interoperability for HealthIT. The potential applications are endless.

The Science

The equation for success requires partners. Summerside has a unique ability to bring partners to the table. Together we can further extend our existing infrastructure and mutually benefit from shared investments that deliver value for the community.

City of Summerside Smarter Homes Incentive Program

HEAT FOR LESS COLD!

CONVENIENT • AFFORDABLE • SUSTAINABLE

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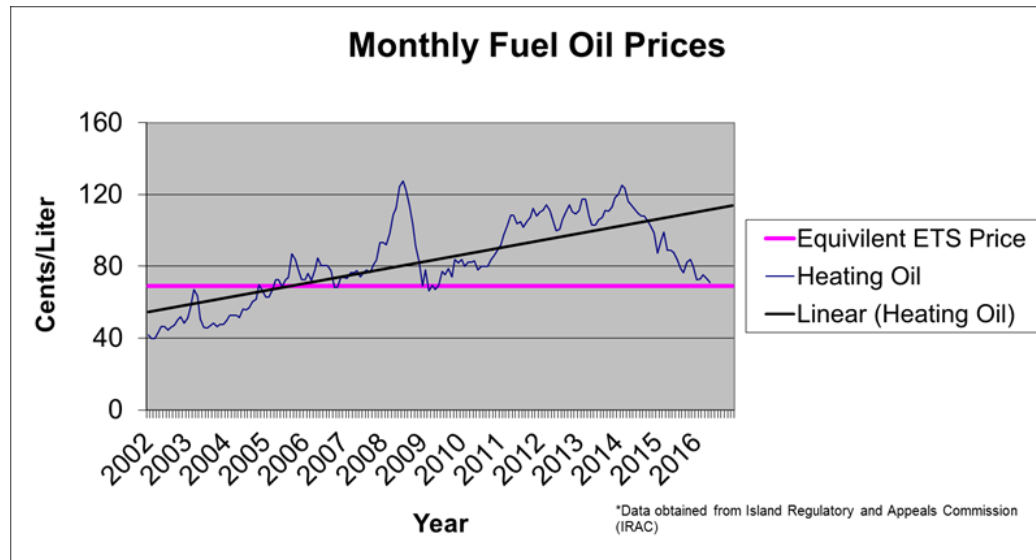
MyPowerNet Opportunity in 2010

Summerside Electric's current energy portfolio

- 54% imported (NB Power)
- 46% wind energy (Summerside and West Cape)
- Wind Surplus exported (to NB) – 8,500,000 kwh's

City of Summerside Heat Sources

- 10% from electrical heat (changing quickly)
- 90% from fossil fuels



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My *Power*Net Vision

- **Directing the wind farm benefits to the residents**

Reduce Heating and Hot Water Costs against oil energy sources
Reducing Greenhouse Gas Emissions

- **Creating an Additional Revenue Source for the Utility**

Reduce wind exports to Zero (Use locally)
Increase OFF – PEAK sales (better margins)
Stem the increase in Peak Growth on System

- **Create Economic Development Opportunities**

Create an electric infrastructure network
Living Lab for Research and Development
Flexibility of Infrastructure – Less Barriers
Increase disposable income to all Residents
One Degree of Separation from the World



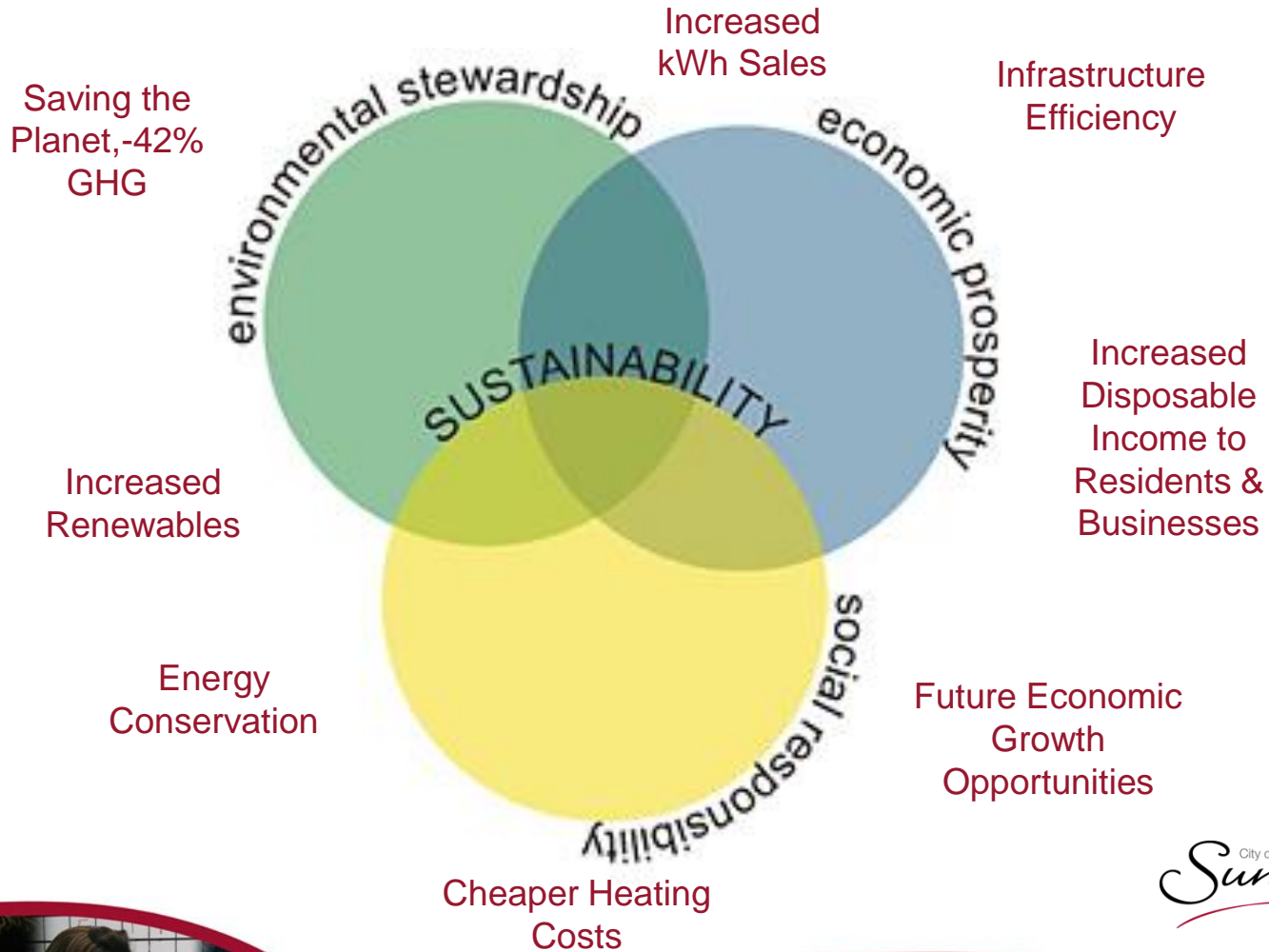
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MyPowerNet

Sustainability to the Power of Three



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MyPowerNet Technology



- **Automatic Metering in Time Intervals**
Tantalus Metering System – Ethernet



- **Energy Thermal Storage Systems**
Steffes heating appliances – Ethernet



- **Controllable Efficient Hot Water Tanks**
Ethernet connected – heat to 170F or 76.6C

- **Communications Network**
Real time high speed control with security



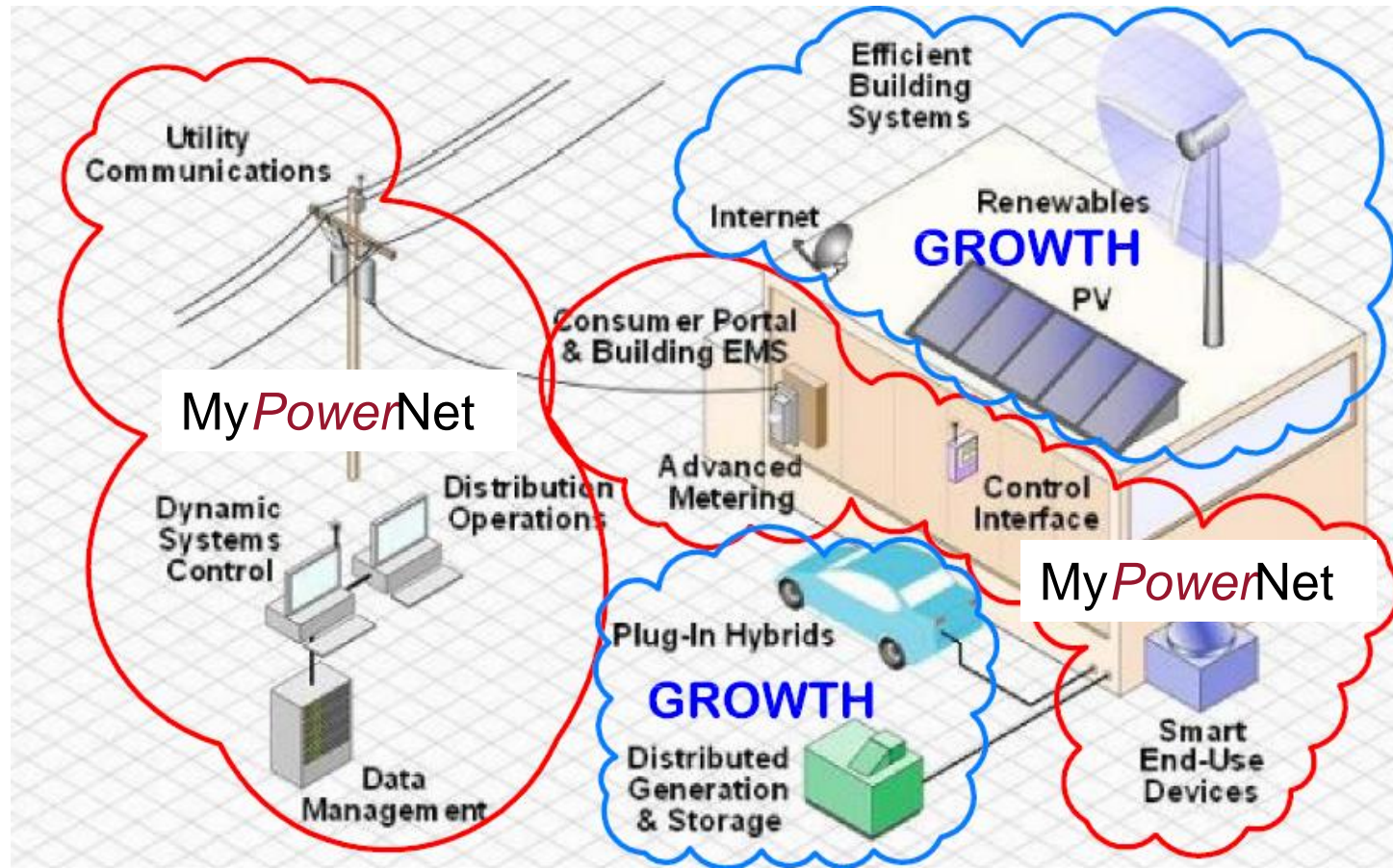
- **Utility Scada Systems – Virtual Power Plant**
Manage the demand, not the supply (limits)

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MyPowerNet Components



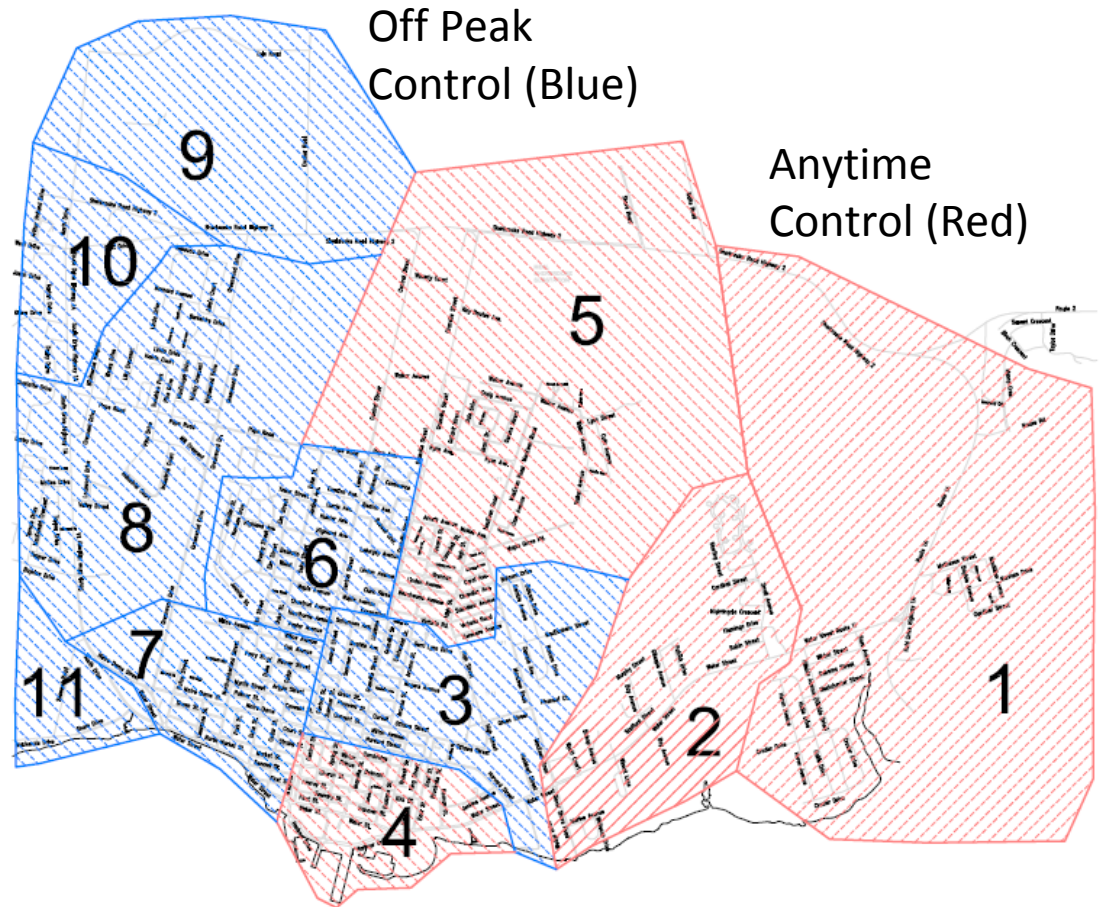
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Communications Zones

- 11 Sections (4 Completed)
- 325 Appliances, (140 Real time control, 185 time clock control)



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Energy Storage Capacities

- **Furnaces**

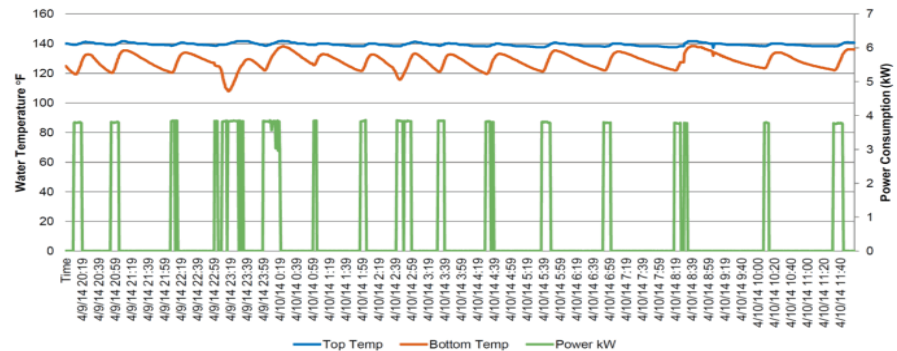
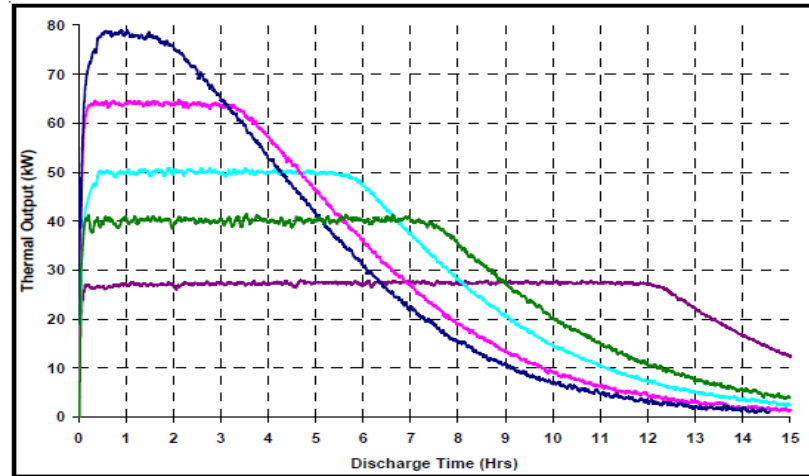
- 19.2 kW to 80.0 kW Inputs
- 86.0 kWh's to 480.0 kWh's

- **Room Heaters**

- 2.4 kW to 10.8 kW Inputs
- 13.5 kWh's to 40.0 kWh's

- **Hot Water Heaters**

- 50 USG to 105 USG
- 76.7 Degree Celcius
- 4.5 kW Inputs
- 5 kWh's to 12 kWh's



Notes: F = Fahrenheit, kW = kilowatt

Courtesy: Service Logic

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MyPowerNet Executions

- **Business Plan for Program to Decision Makers**

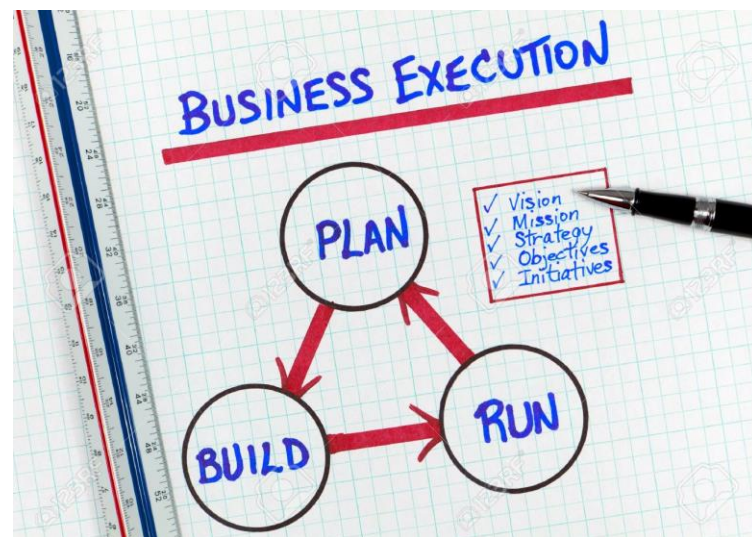
No subsidies required, Self - sustaining
Limit investment risks to benefits garnered
Consumer/Utility/Environment

- **New Electric Rate Classifications**

Easily understandable
No life Style Changes
Establish Trust with Customer

- **New Partnerships**

Local contractors for installs
Local suppliers of material
Manufacturer relationships for Distributor rights



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MyPowerNet Logistics

- **Change in Operations**

- New marketing plans
 - New sales plans
 - New training requirements
 - New servicing considerations

- **Change in Work Site**

- Going beyond the meter
 - Personal spaces

- **Change in Utility Cores**

- New software functions
 - New Information Network needs



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MyPowerNet Collaborations



**Fiber
Connections Inc.**
Innovate | Design | Deliver



**George Smith &
Sons Plumbing &
Heating**

**Advanced
Air Systems**



**Economy
Electric**

**Waite's
Electric**

**Buchanan
Electric**

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MyPowerNet Results (Sept. 2016)

325 ETS units installed

147 hot water heaters, 52 furnaces, 126 room heaters
212 premises – 3,100 kW's for load shaping

Increased Off-Peak sales for Utility

Increased Demand Response for Utility

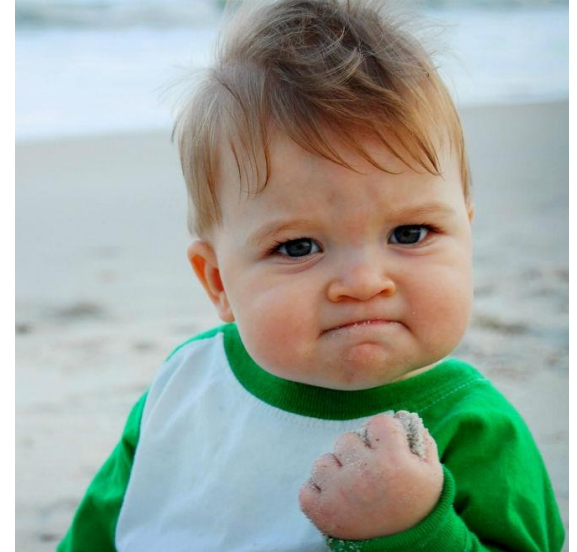
Annual increased revenue for Utility

Used for consumer program and fiber build

99% Customer Satisfaction

32-85% GHG Reduction (Possible)

Customer saves against heating oil (5-40%)



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What to Do with Demand Response?

Grid Decisions and Control are Crucial

- What result do you want for the full grid?
 - Integrating renewables?
 - Avoidance of peak demands?
 - Load Shifting?
 - Best GHG emission reduction?
 - Best benefit to consumer?
 - Best benefit to electric utility?

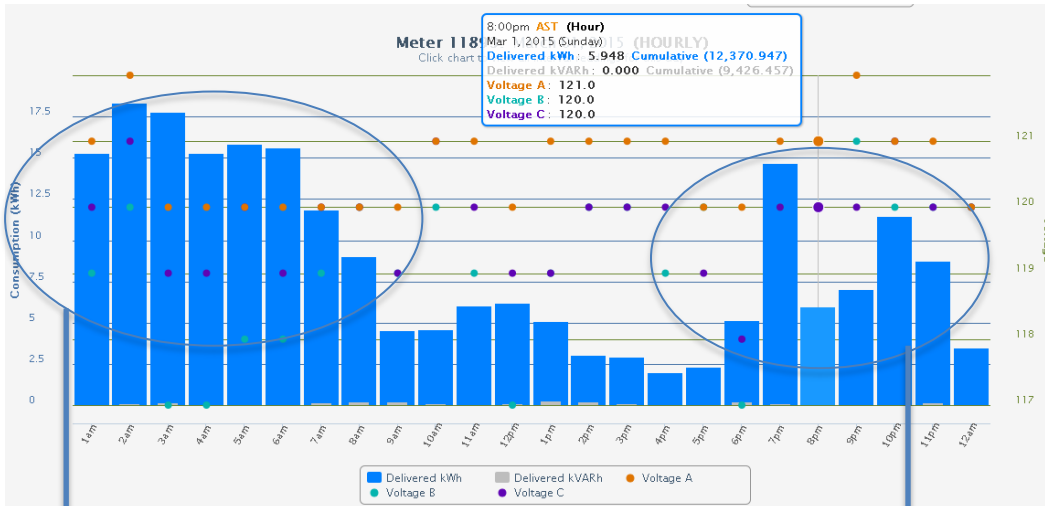


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Operational Information

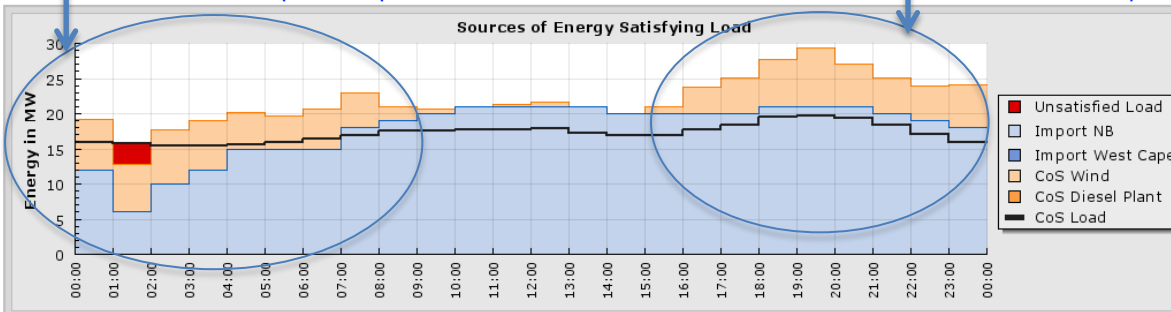


Business with 19.2 kW furnace, March 1, 2015

Previous Day
Saturday February 28th

Sunday March 1st, 2015

Following Day
Monday March 2nd, 2015



Utility Grid Load and Supply, March 1, 2015

Matching
ETS with Wind

Matching
ETS with Wind

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MyPowerNet - Reducing Exports

Less Wind Energy Exported = More Local Use

- 2010 (8,500 MWh's)
- 2011 (7,443 MWh's)
- 2012 (4,103 MWh's)
- 2013 (3,363 MWh's)
- 2014 (2,004 MWh's)
- 2015 (1,994 MWh's)



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Consumer Program

Incentives for electric thermal storage and controllable hot water tank customers.

Purchase, Lease or Rent Appliances

Rate Discount Incentives (Locked for 5 years)

Hot Water – 8.0 cents / kWh Year Round

Space Heating – 8.0 cents / kWh

Bucket rate blocks

Consumers

Participate through our

Heat For Less Now

Program



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MyPowerNet Customer Results

• Amalgamated Dairies Ltd. (ADL)

- Industrial Milk Processor
- Installed 160kW of ETS
- Cost Installed ~ \$75,000
- Savings ~ \$59,000 / year
- Simple Payback of ~ 1.3 years



Lefurgey Cultural Centre – Heritage Office Building

- Heritage Office Building
- Has 56kW Total Installed
- Cost Installed ~ \$15,000
- Savings ~ \$2,200 / year
- Simple Payback of ~ 6.8 years



Independence Place – Row Housing

- 11 unit attached living units
- 6 kW room heater in each unit
- Cost Installed ~ \$17,650
- Savings ~ \$3,051 / year
- Simple Payback of ~ 5.8 years



Summerside Motel & Restaurant

- Full Service Motel
- Has 38kW Total Installed
- Cost Installed ~ \$8,528
- Savings ~ \$2,853 / year
- Simple Payback of ~ 2.9 years



Single Family Dwelling

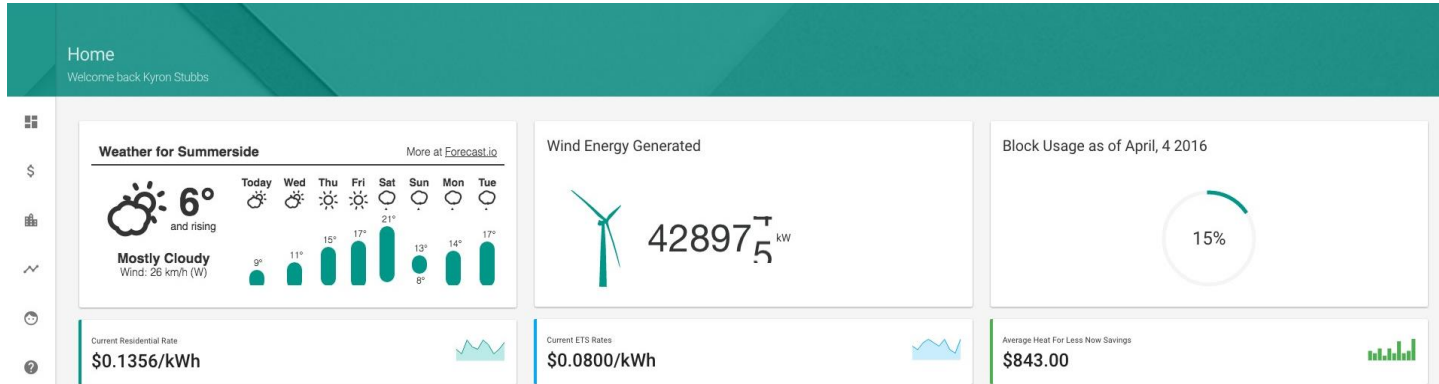
- ~ 1600 square foot home
- Has 28kW total Installed
- Cost Installed ~ \$8,206
- Savings ~ \$1,450 / year
- Simple Payback of ~ 5.6 years

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Customer Web Portal



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MyPowerNet Engagement

- 5 year or less payback (ROI >20%)
- Convenient and comfortable (no life style change)
- Greener / environmentally friendly
- Increased disposable income
- Electricity Conservation/Information

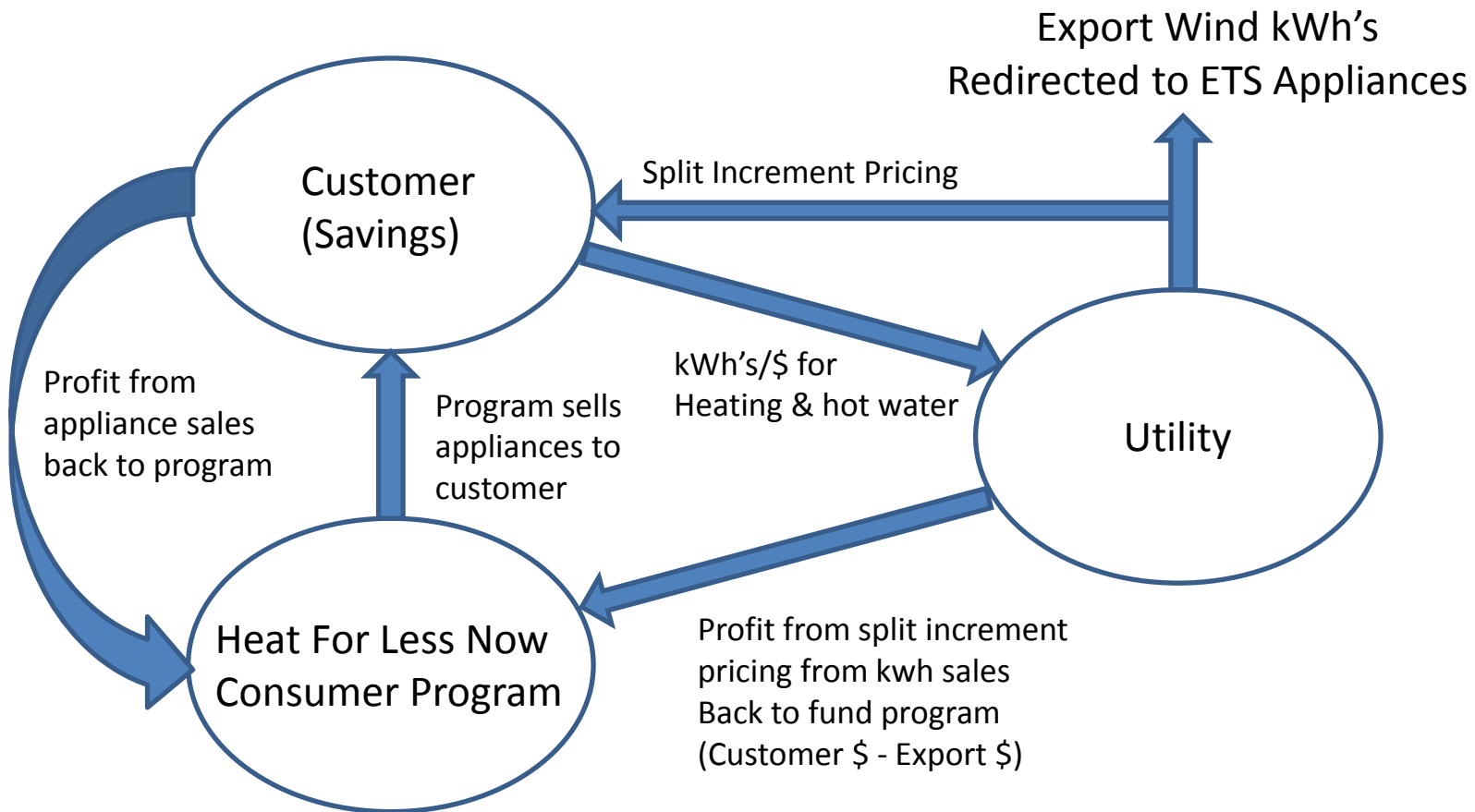


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MyPowerNet Financial Structure



Key Point: Profit from appliance sales and profit from split increment pricing pays for Operating and Capital Investments in program and communications construction. Those customers participating in program do not cause rate increase pressures on those not participating. (As more kWh's sell more to invest)

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Research

Information = Power
If you can measure it you can control it.

Check your cost

Hourly cost and energy usage now available!

The Net Energy Market helps you understand your energy usage

Welcome back, **JANE SMITH**
Account #: 000000000

Current Bill Period ends: AUG 5
Website updated through: 2013-07-19 00:00
[View a Previous Bill PDF](#)

Pay Your Bill Online?
[Go To BillPay](#)

Costs to Date

\$243 *Projected As of JUL 18
\$113

[Details](#)

*Taxes and fees are estimated for Residential

Electric Usage

Usage is down **27%**

[Details](#)

Current average daily usage compared to last bill period.

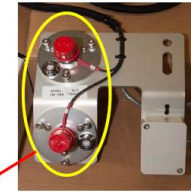
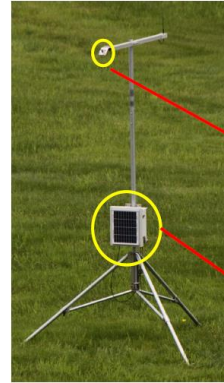
Environmental Impact

cars **52**

[Details](#)

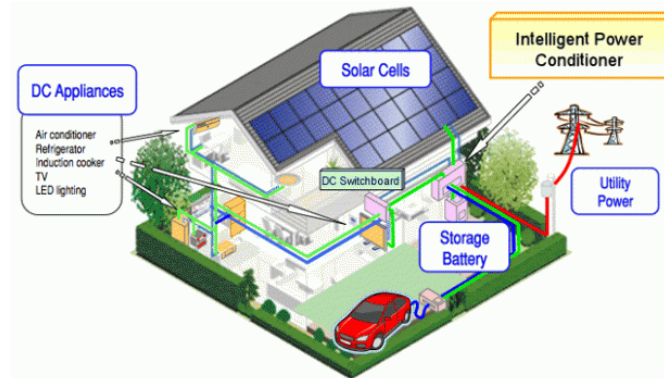
Your impact this bill period equals the exhaust produced by this many cars driving for a day.

Equipment



Pyranometers
- To be mounted on lamppost crossarm

Enclosure
(data processing, communications, and power) - To be mounted to pole



Sharp's Eco House and Intelligent Power Conditioner System Configuration



Prince Edward Island, Canada



What's Next for the City of Summerside



City of
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Prince Edward Island, Canada



Continue to Try and You Will Succeed

Small City. Big Spirit

Greg Gaudet, P.Eng.,
Director Municipal Services

275 Fitzroy Street
Summerside, PE
C1N 1H9

Cell: (902)439-5776

Fax: (902)436-4255

Email: ggaudet@city.summerside.pe.ca

Web: www.city.summerside.pe.ca



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