



## How are Local Governments Leveraging Green Power?

How a small district is turning solar and storage into revenue, is electrifying its fleet vehicles, has supported home energy upgrades and greened its streetlights and city buildings.

Tami Rothery of Summerland, BC and host Bruce Nagy discuss successful municipal clean energy projects and policy tools.

Apr 21<sup>th</sup> 2021 | 2:00 PM - 3:00 PM ET



# Clean Air Partnership

CLIMATE SOLUTIONS WEBINAR SERIES





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CLIMATE SOLUTIONS WEBINAR SERIES



## WEBINAR SERIES - UPCOMING

◇ ELECTRIFIED BUSES, TROLLEYS AND INNER-CITY TRANSIT PLANNING

◇ CARBON ACCOUNTING FOR GOVERNMENTS & BUSINESSES

◇ SEWAGE HEAT RECOVERY & COMMUNITY ENERGY

**BRUCE (BF) NAGY**  
CLIMATE SOLUTIONS

- ◇ COLUMNIST & SPEAKER
- ◇ CONSULTANT
- ◇ AUTHOR 200+ ARTICLES ON CLIMATE SOLUTIONS
- ◇ AUTHOR *THE CLEAN ENERGY AGE*,  
ROWMAN & LITTLEFIELD



Climate solutions  
Expert best practices  
Case examples  
Clear priorities



# SOLUTIONS, PRIORITIES, CASE EXAMPLES



## BUILDINGS

NEW & RETROFIT TECHNOLOGY & PROGRAMS



## TRANSPORTATION

ELECTRIC FLEETS, INFRASTRUCTURE & TRANSIT VEHICLES



## POWER GENERATION & STORAGE

TECHNOLOGY, PLANNING & ECONOMICS

# TODAY

## **TAMI ROTHERY, DISTRICT OF SUMMERLAND, BC**

- ◇ DISTRICT SOLAR & STORAGE PROJECT, GREEN FLEET, LED STREETLIGHTS, ROOFTOP SOLAR, EV CHARGERS
- ◇ CLIMATE CHANGE CHALLENGES IN SUMMERLAND
- ◇ CLIMATE ACTION EFFORTS, PRIORITY SETTING & BUSINESS CASE PROCESS
- ◇ FUNDING OPPORTUNITIES

## **WE WILL ALSO TOUCH ON MUNICIPAL RENEWABLES, BATTERIES AND MICRO-GRID TRENDS & CASE EXAMPLES**

PROJECTS IN STRATFORD, ONT, SAINT JOHN, NB, FORT CHIP, ALTA, GULL BAY, ONT, CHARLOTTETOWN & STRATFORD PEI, WOLFSVILLE & HALIFAX, NS, AND EDMONTON, ALBERTA.



# TODAY'S GUEST PRESENTER



## **TAMI ROTHERY**

**SUSTAINABILITY / ALTERNATIVE ENERGY COORDINATOR, DISTRICT OF SUMMERLAND.**

TAMI HAS WORKED FOR MORE THAN A DECADE IN POST-SECONDARY, NOT-FOR-PROFIT, AND PRIVATE ORGANIZATIONS TO ADVANCE THE BALANCE BETWEEN PROFIT, PLANET, AND PEOPLE, AND HAS BEEN INVOLVED WITH ORGANIZATIONS SUCH AS THE MEANINGFUL WORK PROJECT, BULLFROG POWER, AND THE RECYCLING COUNCIL OF ALBERTA.

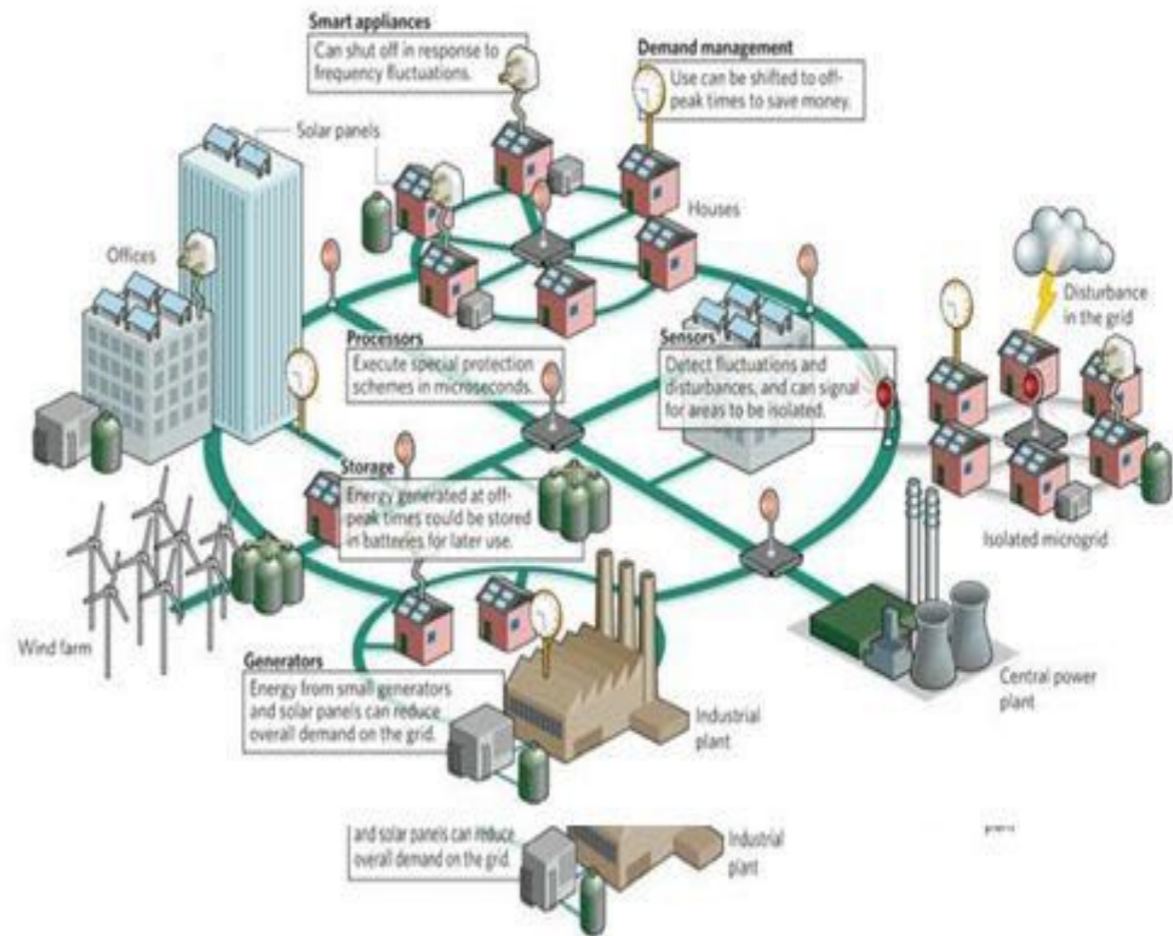
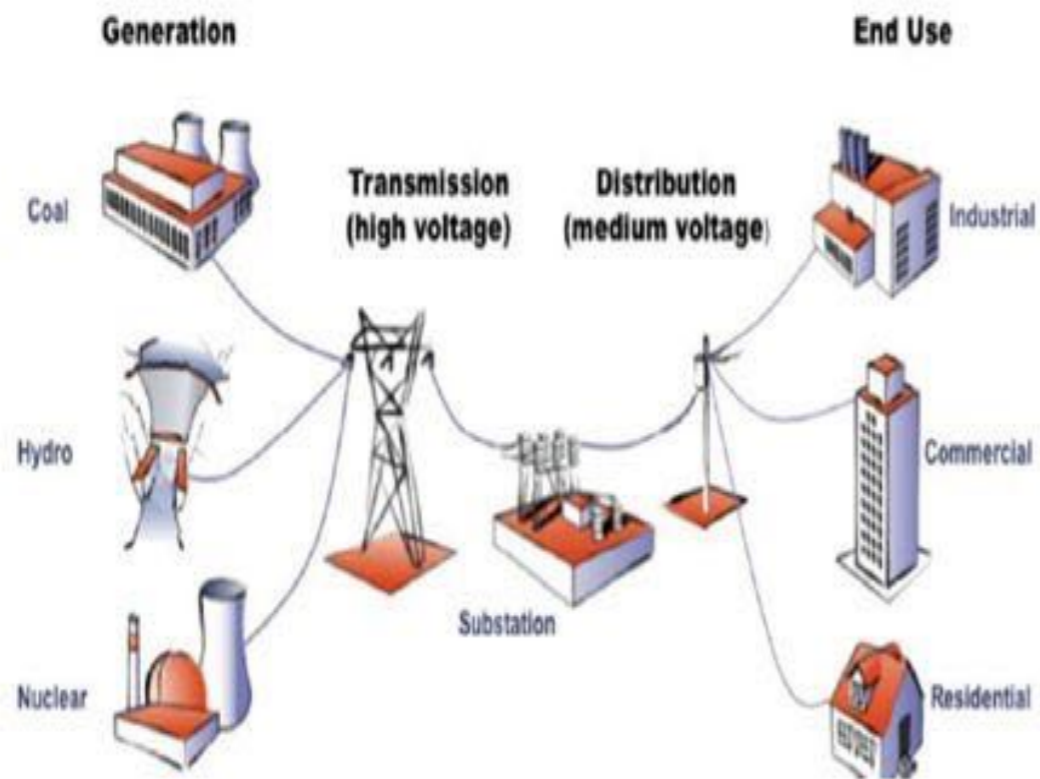
AS A PASSIONATE COMMUNITY LEADER, TAMI IS A FIRM BELIEVER IN WORKING COLLABORATIVELY TO FIND OPPORTUNITIES TO CREATE RESILIENT, NET-POSITIVE SYSTEMS THAT IMPROVE QUALITY OF LIFE FOR ALL PEOPLES AND THAT EMPOWER COMMUNITY MEMBERS TO CREATE THE CHANGES THEY WISH TO SEE IN THE WORLD.

# POWER UTILITIES RE-DEFINED

Legacy Bulk Electrical System



Microgrids



PRESENTLY: CENTRALLY GENERATED POWER DISTRIBUTED IN ONE DIRECTION LONG DISTANCES.  
GRAPPLING WITH MORE AND MORE RENEWABLES PLAYERS AND MICRO-GRIDS  
WHO WANT TWO WAY FLOW AND NEED MORE AND BETTER INFRASTRUCTURE.

# CITIES ARE AMONG THE NEW POWER PLAYERS



CITY MICRO-GRIDS



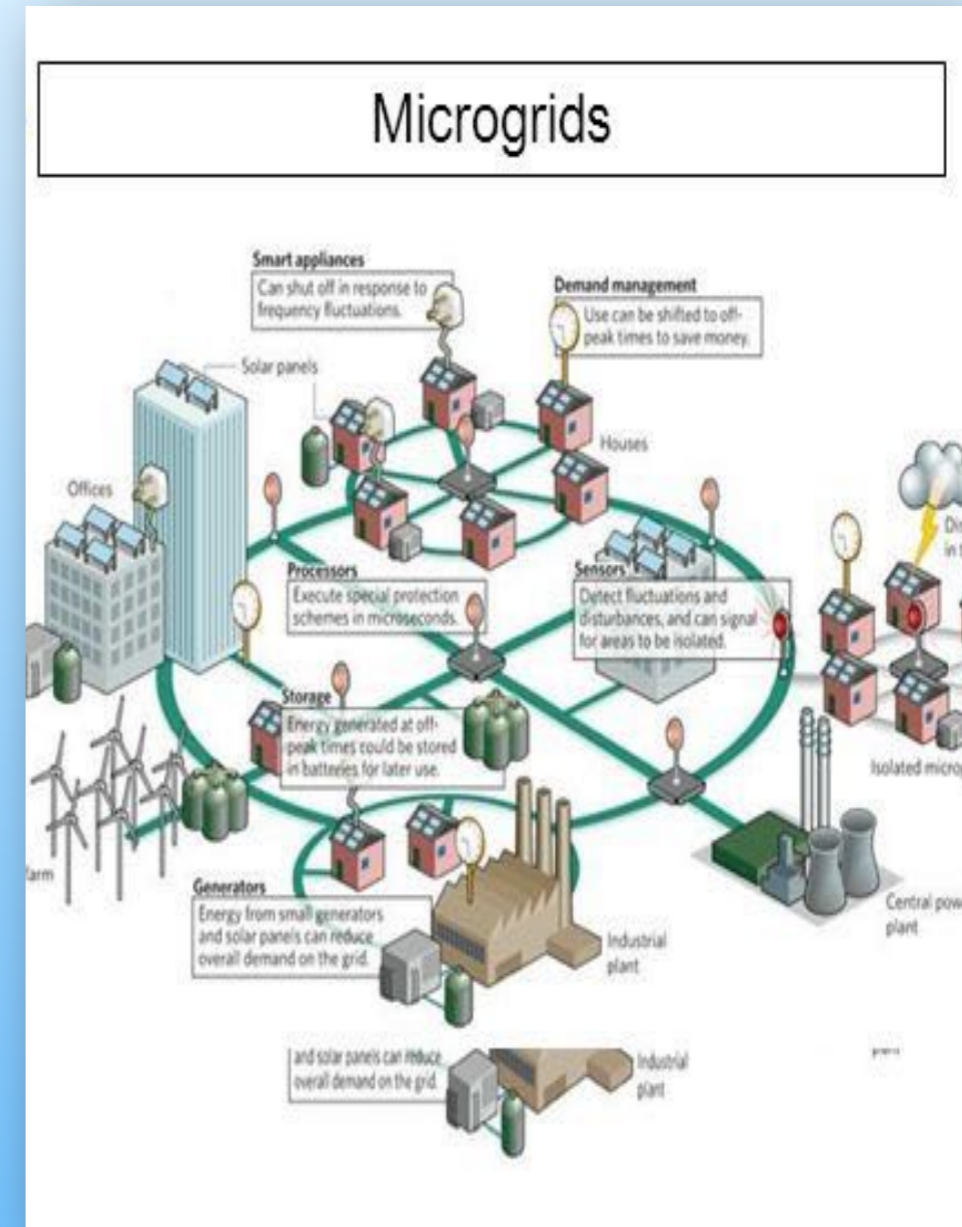
# POWER UTILITIES RE-DEFINED ELECTRICITY LANDSCAPE REDEFINED

## FUTURE: NUMEROUS MICRO-GRIDS

- ◇ EACH MICRO-GRID ACHIEVES ITS OWN POWER GENERATION, POWER OPTIMIZATION & SHARING
- ◇ MICRO-GRIDS CONNECTED TO EACH OTHER FOR POWER TRADING
- ◇ MICRO-GRIDS STILL CONNECTED TO CENTRAL GRID FOR SOME USES AND BACKUP
- ◇ ELECTRIC CAR BATTERIES AND HOME BATTERIES ARE PART OF THE STORAGE MIX

## MICRO-GRID BENEFITS

- ◇ LOCALIZED LOW-LOSS, HIGH-QUALITY, COST EFFECTIVE POWER
- ◇ REDUCED PRESSURE ON UTILITIES & GOVERNMENTS FACING GROWING GENERATION DEMAND (POSSIBLY) AND IMPOSSIBLY COSTLY INFRASTRUCTURE UPGRADING.



# STRATFORD ONT BATTERY PROJECT



CITY-OWNED PUBLIC UTILITY FESTIVAL HYDRO, WORKING WITH ONTARIO HYDRO AND SEVERAL PRIVATE FIRMS IN 2017, INSTALLED A POWIN ENERGY STACK140 ENERGY STORAGE SYSTEM.\*

STORE ENERGY DURING NON-PEAK TIMES TO BE UTILIZED DURING HIGH-PEAK DEMAND TIMES AND REDUCE DEMAND ON THE FESTIVAL HYDRO GRID DURING SYSTEM PEAK HOURS, REDUCE INFRASTRUCTURE, BALANCE LOAD, AND VOLTAGE STABILITY.



\* FOUR LITHIUM-ION BATTERY CELL ARRAYS, TWO WITH 2-MEGAWATT CAPACITY, AND TWO WITH 2.4-MEGAWATT CAPACITY FOR AN OVERALL STORAGE CAPACITY OF 8.8-MEGAWATTS, EQUALLING 40.8-MEGAWATT HOURS INSTALLATION.

# STRATFORD ONT BATTERY PROJECT



## **BENEFITS**

PROVIDES 40.8 MEGAWATT/HOURS OF POWER,  
BUILDING RESILIENCY & STABILITY DURING AN  
UNCERTAIN PERIOD.

DISPLACES A MULTI-MILLION DOLLAR PEAKER PLANT  
PLANNED BY ONTARIO HYDRO TO ACCOMMODATE  
GROWTH IN THE CITY AND SURROUNDING AREA. THIS  
WOULD HAVE MEANT PRESSURE ON STRATFORD  
ASSETS BUDGETS.

HELPS THE CITY REDUCE ITS CARBON FOOTPRINT.

# SAINT JOHN, NB BATTERY PROJECT

◇ A 1.25-MEGAWATT LITHIUM-ION TESLA BATTERY.

◇ INVESTED \$1.5 MILLION.

◇ OFF-PEAK SAVINGS ABOUT \$200,000 PER YEAR.

◇ SIMPLE PAYBACK ABOUT 7.5 YEARS.

◇ THE BURCHILL WIND PROJECT IN SPRUCE LAKE  
MAY MEAN UP TO ANOTHER \$30,000 A YEAR IN  
SAVINGS, REDUCING PAYBACK ON THE BATTERY

◇ SUPPORT FROM THE FEDERAL GOVERNMENT  
WILL REDUCE IT AGAIN.

◇ DISPLACES GAS PEAKER PLANT REDUCING EMISSIONS



# FORT CHIPEWYAN, SOLAR PROJECT

THREE NATIONS ENERGY OWNED BY  
ATHABASCA CHIPEWYAN FIRST NATION,  
MIKISEW CREE FIRST NATION AND FORT  
CHIPEWYAN METIS ASSOCIATION

◇ ABOUT 200 KILOMETRES NORTH  
OF ALBERTA'S OIL SANDS

◇ WILL REDUCE THE NEED FOR MORE  
THAN 800,000 LITRES OF DIESEL FUEL  
EACH YEAR

◇ CUT GREENHOUSE GAS EMISSIONS  
BY 2,250 TONNES



◇ NEW FORT CHIP 2.2-MEGAWATT SOLAR FARM (\$7.76 MILLION)

◇ IN COMBINATION WITH POWER FROM A NEARBY  
600- KILOWATT SOLAR FARM OWNED BY ATCO

◇ AND A BATTERY STORAGE SYSTEM

# GULL BAY, SOLAR PROJECT

“YOU CAN HEAR THE BIRDS AND CRICKETS.”

GULL BAY (KIASHKE ZAAGING ANISHINAABEK) IS ABOUT 200 KM NORTH OF THUNDER BAY, ONTARIO

◇ THE NEW \$8 MILLION SYSTEM WILL BE FULLY OWNED BY GULL BAY FIRST NATION AND OPERATED BY MASHKAWIZIWIN ENERGY.

◇ 1000 SOLAR PANELS, 80 BATTERY MODULES

◇ CUT ANNUAL DIESEL USE BY 100,000 GALLONS, REDUCE GREENHOUSE GASES BY 300 TONNES EACH YEAR.

◇ RELIABILITY, RESILIENCE, PEACE OF MIND FOR RESIDENTS IN 97 HOMES.



PROJECT HELPED RECONCILE A 1940S INJUSTICE INVOLVING ONTARIO HYDRO DAMS THAT DESECRATED INDIGENOUS BURIAL GROUNDS

# PRINCE EDWARD ISLAND & NOVA SCOTIA

**CHARLOTTETOWN & STRATFORD, PEI, AND WOLFSVILLE, NS**

HAVE APPLIED FOR \$15 MILLION FROM FCM

UNDER THE **COMMUNITY EFFICIENCY FINANCING INITIATIVE.**

PARTNER IS PACE ATLANTIC COMMUNITY INVESTMENT CORPORATION.

MUNICIPALITIES WOULD OFFER BELOW MARKET-LEVEL INTEREST RATES ON FINANCING TO HOMEOWNERS AND BUSINESS OWNERS FOR ENERGY RETROFITS AND RENEWABLE ENERGY.

WOULD ALSO HELP THE PUBLIC TAKE ADVANTAGE OF EXISTING PROGRAMS, SUCH AS AT **EFFICIENCYPEI.**

UP TO 30 PER CENT OF IT COULD BE USED FOR NON-ENERGY RELATED INITIATIVES THAT HELP PEOPLE BETTER PREPARE FOR CLIMATE CHANGE IMPACTS, SUCH AS FLOOD-PROOFING AND LEAD WATER LINE REPLACEMENT.



# WHY PACE WORKS WELL

## PROPERTY ASSESSED CLEAN ENERGY

A LOW OR NO INTEREST LOAN RATHER THAN A GRANT

FOR RESIDENTIAL DEEP ENERGY UPGRADES

SUCH AS INSULATION, HEAT PUMPS, WINDOWS, SOLAR,

BATTERIES OR GEOTHERMAL.



◇ AS CLEAN ENERGY CONSISTENTLY PAYS FOR ITSELF,  
THE KEY BARRIER TO ADOPTION FOR THESE MORE COSTLY  
UPGRADES IS NOT POOR PERCEPTION OF THE INVESTMENT,  
BUT RATHER UP FRONT CASH OUTLAY.

◇ GRANTS CREATE INDUSTRY BOOM & BUST CYCLES AND  
TECHNOLOGIES DON'T DEVELOP TO THE POINT OF  
FLOURISHING ON THEIR OWN MERITS

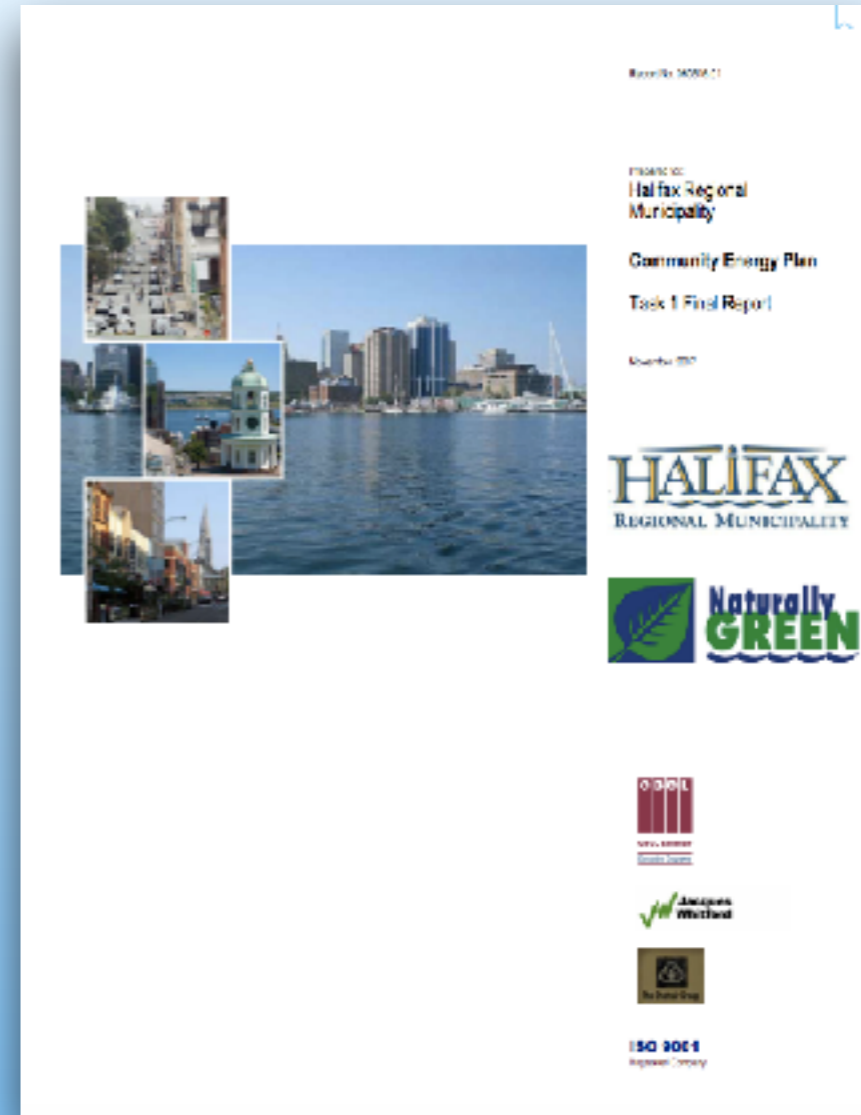
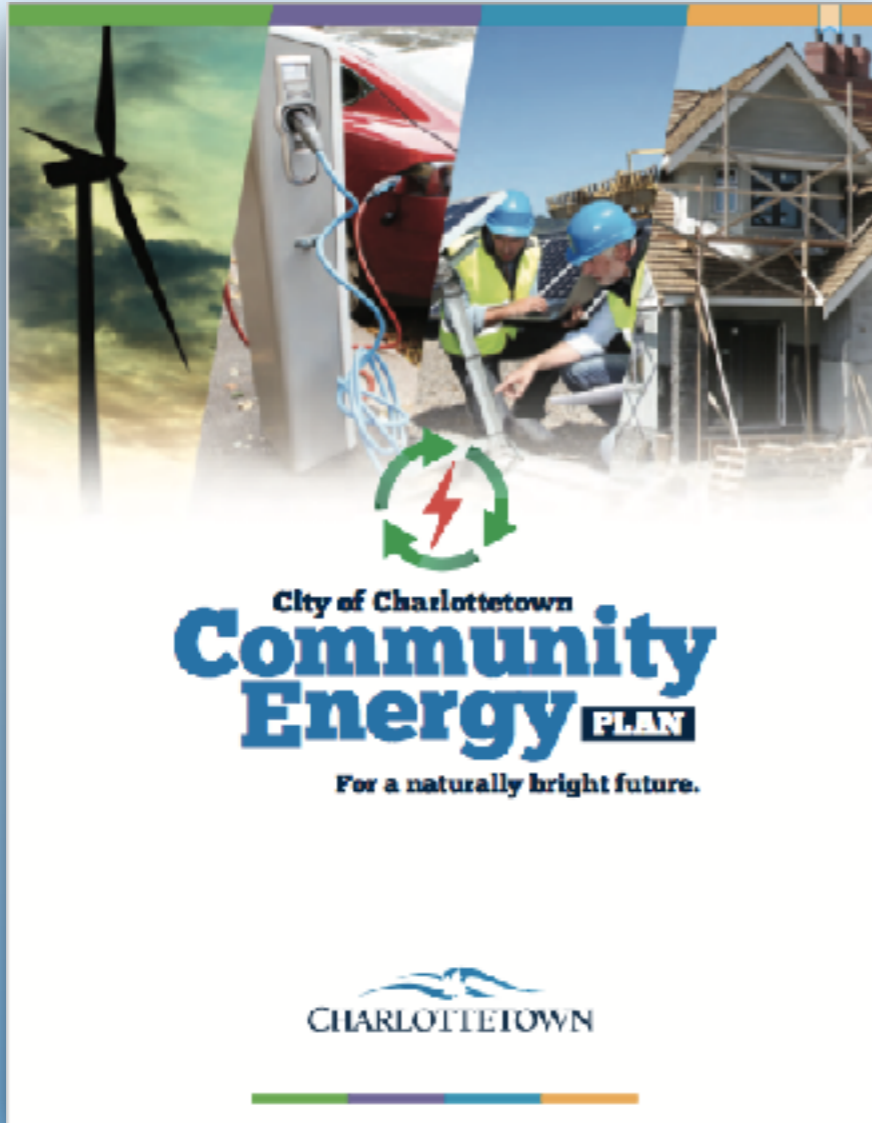
◇ GRANTS DEplete PROGRAM BUDGETS FAST, MAKING  
THE PROGRAM SHORT-LIVED, REDUCING IMPACT,  
REDUCING CONTRACTOR COMMITMENT

◇ LOANS ACCURATELY REFLECT THE VALUE OF ENERGY UPGRADES  
AS A SIGNAL TO OWNERS, BANKS, REALTORS, AND INSURERS.

◇ PACE LOANS ARE REGISTERED ON TITLE, ELIMINATING  
HESITANCY FOR THOSE WHO MAY SELL



# PRINCE EDWARD ISLAND COMMUNITY ENERGY?



COMMUNITY ENERGY INITIATIVES CAN BE PROMOTED AND SUPPORTED BY CITIES. THEY'RE FOR PEOPLE WHO WANT TO INVEST INDIRECTLY IN LOCAL CLEAN ENERGY. SOME DUE DILIGENCE IS REQUIRED TO ENSURE YOUR CITY IS PROMOTING PARTNER ORGANIZATIONS THAT COMPLY WITH COMMUNITY ENERGY RULES DESIGNED TO PROTECT MEMBERS.

# BLATCHFORD IN EDMONTON



## **GEOHERMAL HEATING & COOLING RENEWABLE, BUT NOT RENEWABLE POWER**

HUGE 30,000 RESIDENT GEOHERMAL DISTRICT ENERGY COMMUNITY NEAR DOWNTOWN.

LARGE VALUABLE SITE BECAME AVAILABLE WHEN A SMALLER AIRPORT PROVED OBSOLETE AFTER A LARGE SUBURBAN AIRPORT WAS BUILT.

BIG POLITICAL/NIMBY/HERITAGE/VESTED INTERESTS STRUGGLE TO MOVE PROJECT FORWARD. TOOK YEARS.



# FCM SUPPORTS

THE FEDERATION OF CANADIAN MUNICIPALITIES (FCM.CA) GREEN MUNICIPAL FUND OFFERS NUMEROUS FUNDING AND OTHER KINDS OF SUPPORT PROGRAMMING. BELOW ARE A FEW EXAMPLES.

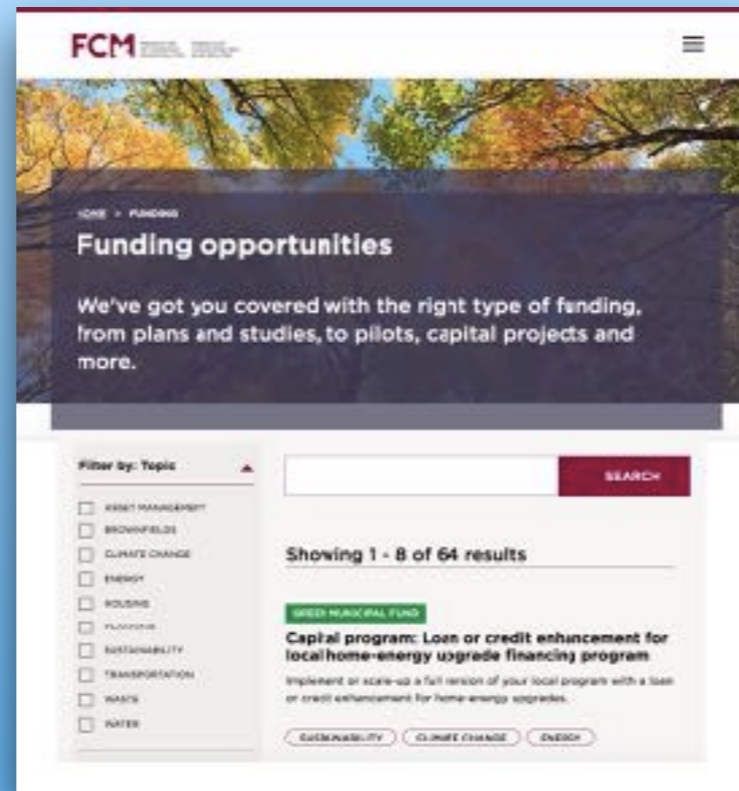
## COMMUNITY EFFICIENCY FINANCING - PACE

**PROPERTY ASSESSED CLEAN ENERGY \$300 MILLION INITIATIVE HELPS MUNICIPALITIES DELIVER ENERGY FINANCING PROGRAMS FOR LOW-RISE RESIDENTIAL PROPERTIES.**



## FCM FUNDING PAGE

SEARCH FILTERS TO FIND THE FUNDING SUPPORT PROGRAMS YOUR MUNICIPALITY NEEDS.



## LOW CARBON CITIES CANADA

SEVEN OFFICES ACROSS THE COUNTRY THAT SHARE CLIMATE INITIATIVE LESSONS LEARNED AND REPLICABLE ACTIVITIES WITH CITIES AND COMMUNITIES OF ALL SIZES ACROSS CANADA



# RESOURCE SCREENS

ADDITIONAL INFORMATION CAN BE FOUND AT THE END OF THIS PRESENTATION ON:

◇ EMERGING CLIMATE ACTION PATHWAYS FOR MUNICIPALITIES

◇ RESILIENCE PLANNING IN FAIRFIELD CONNECTICUT

◇ RESILIENCE PLANNING IN AUSTIN TEXAS

◇ REPLACING GAS PLANTS WITH BATTERIES IN THREE  
NEW YORK STATE MUNICIPALITIES

◇ REPLACING GAS PLANTS WITH BATTERIES IN SEVERAL  
CALIFORNIA TOWNS IN THE OAKLAND REGION

◇ BIG BATTERY ELECTRICITY STORAGE IN AUSTRALIA



**DESI PLEASE SWITCH TO  
TAMI ROTHERY,  
DISTRICT OF SUMMERLAND**

# RESOURCE SCREENS

# EMERGING PATHWAY FOR MUNICIPALITIES



## Strategy

**Climate emergency declaration**

### Set targets

- Emissions
- Renewables
- Waste management

### Create specific Supports

- Regulatory
- Incentives
- Training
- Support hubs
- (Some research)

## Implementation

• Building standards & deep energy retrofit incentives, programs

• Urban planning for density, retrofits, transit, cycling, walking, new kinds of electric vehicles

• Rapid transit investment, modern approaches including electric buses, BRT, LRT

• Government fleets & infrastructure, private sector fleet support

• Vehicle incentives & infrastructure

• Waste management

## Corollary

### Education/Training

- Developers/architects/engineers
- Homeowners
- Trades/students
- Civil service/Inspectors

### Create partnerships

- Federal
- Province, City, State
- Utilities
- Consultants
- Professional & Trade Orgs
- (Universities & thinktanks)

# RESILIENCE PLANNING AFTER A HURRICANE

## FAIRFIELD CONNECTICUT

HURRICANE IRENE IN 2011  
KNOCKED OUT POWER TO  
NEARLY 1 MILLION  
CONNECTICUT HOMES AND  
BUSINESSES.

FAIRFIELD, A TOWN OF  
60,000 WITHIN FIVE MILES  
OF COASTAL SHORELINE,  
DEVELOPED A MUNICIPAL  
MICRO-GRID SYSTEM TO GO  
ONLINE IN 2015.



THE MICRO-GRID POWERS THE TOWN'S POLICE AND FIRE HEADQUARTERS, EMERGENCY COMMUNICATIONS CENTRE AND NEARBY CELL TOWER, AND A HOMELESS SHELTER.

IF THE MAIN GRID SHUTS DOWN, THE MICROGRID CAN OPERATE IN ISLAND MODE, KEEPING THE POWER ON.



# RESILIENCE PLANNING AFTER A HURRICANE

MICROGRIDS CAN RUN ON A VARIETY OF POWER SOURCES. IN THE CASE OF FAIRFIELD, THERE IS A 300-KILOWATT NATURAL GAS GENERATOR, 47-KILOWATT SOLAR PHOTOVOLTAIC SYSTEM, AND A 60-KILOWATT COMBINED HEAT AND POWER GENERATOR THAT ARE TIED TOGETHER AND CAN PROVIDE UP TO 120 PERCENT OF PEAK POWER USE FOR THE FACILITIES.

COST WAS ABOUT \$1.3 MILLION WITH GENEROUS SUPPORT FROM THE STATE

REQUIRED DIGGING CONDUITS UNDER THE STREETS BETWEEN THEM, “A FAIRLY EXPENSIVE CONSTRUCTION PROJECT.” THE STATE CHANGED ITS LAWS TO AVOID RIGHT-OF-WAY ISSUES THAT

THE TOWN IS SAVING ABOUT \$60,000 A YEAR IN ELECTRIC EXPENSES AND ABOUT \$10,000 A YEAR IN HEATING COSTS.

SIMILAR PROJECTS IN MONTGOMERY COUNTY, MARYLAND, ANCHORAGE, ALASKA AND DENVER, COLORADO.



# AUSTIN RESILIENCE PLANNING TO AVOID ICE STORM BLACKOUTS

## BATTERY & ENERGY STORAGE PROJECTS



### Grid-Scale

Peak Load Reduction  
Sizing Considerations



### Commercial Scale

Demand Charge Reduction  
Sharing Considerations



### Residential Scale

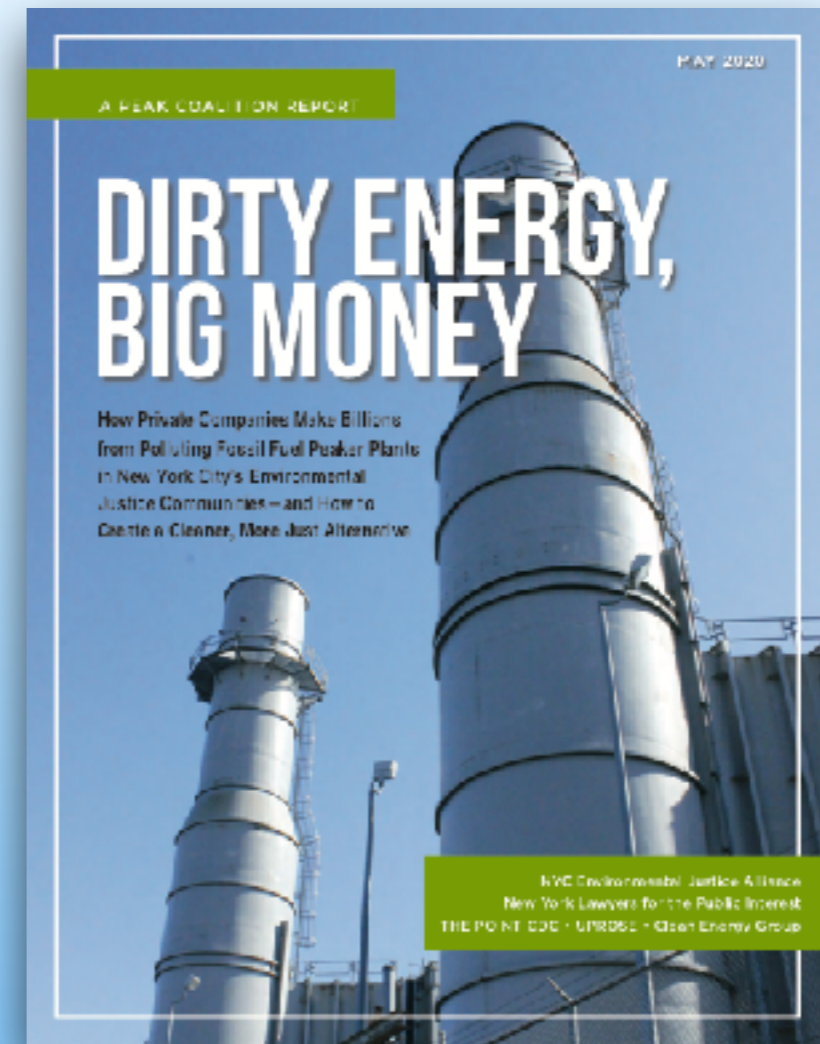
Voltage Support  
Cost Considerations



VIDEO AT [BFNAGY.COM](http://BFNAGY.COM)

# NEW YORK STATE RENEWABLES & STORAGE

- IN THE LAST DECADE NEW YORK HAS PAID MORE THAN \$4.5 BILLION FOR THE CITY'S PEAKER PLANTS - THEY ONLY OPERATE 90 -500 HOURS PER YEAR. 1300% HIGHER THAN THE AVERAGE COST OF ELECTRICITY IN THE STATE.
- IN DECEMBER 2019 NY STATE APPROVED A 20-MEGAWATT BATTERY STORAGE PROJECT IN ULSTER.
- IN JULY 2019, THEY SELECTED TWO OFFSHORE WIND PROJECTS COMBINED CAPACITY IS 1,696 MW
- IN OCTOBER 2019, THEY APPROVED THE DEVELOPMENT OF A 316-MEGAWATT, 8-HOUR-DURATION BATTERY AT THE RAVENSWOOD GENERATING STATION IN LONG ISLAND CITY.



# OAKLAND, CALIFORNIA RENEWABLES

ONE OF SEVERAL OAKLAND AREA CONTRACTS WILL REPLACE OLD JET FUEL TURBINES WITH A 20-MEGAWATT, 80-MEGAWATT-HOUR LITHIUM-ION BATTERY SYSTEM

IT WILL MEET GROWING DEMAND WITHOUT RELEASING LOCAL PARTICULATE POLLUTION OR GREENHOUSE GAS.

SILICON VALLEY CLEAN ENERGY AND MONTEREY BAY COMMUNITY POWER, ALSO SIGNED A JOINT DEAL WITH RECURRENT ENERGY FOR A 150 MEGAWATT SOLAR PLANT COMBINED WITH A BATTERY SYSTEMS RATED AT 45 MEGAWATTS/180 MEGAWATT-HOURS.

THEY ALSO SIGNED A DEAL WITH EDF RENEWABLES FOR 128 MEGAWATTS OF SOLAR CAPACITY COUPLED WITH A 40-MEGAWATT/160-MEGAWATT-HOUR BATTERY PLANT.

EAST BAY COMMUNITY ENERGY JOINED THE ROSTER OF SOLAR-PLUS-STORAGE CUSTOMERS THIS SUMMER, CONTRACTING WITH EDP RENEWABLES NORTH AMERICA FOR A 100 MEGAWATT SOLAR PLANT PAIRED WITH 30 MEGAWATTS/120 MEGAWATT-HOURS OF STORAGE.

IT ALSO SIGNED POWER PURCHASE AGREEMENTS FOR 57.5 MEGAWATTS OF WIND AND 56 MEGAWATTS OF STANDALONE SOLAR.



BATTERIES



JET FUEL TANK

# AUSTRALIA STORAGE FOR SMOOTHING INTERMITTENCY, RESPONDING TO STORM EVENTS



- TESLA BIG BATTERY ORIGINAL COST \$66M
- SAVED \$40M IN YEAR 1 ON FCAS (POWER PURCHASING, SHARING, SMOOTHING)
- 'IMPOSSIBLY,' WIND PLUS BATTERY PROVIDES 50% - 75% OF LOCAL DEMAND
- SURVIVED 3 BIG STORMS INCLUDING THE DESTRUCTION OF 500 KV TRANSMISSION LINE.
- ADAPTED BETTER THAN GAS & COAL, TOTALLY DISPELLED INTERMITTENCY & OTHER RENEWABLES MYTHS.



How are Local Governments  
Leveraging Green Power?

**QUESTIONS?**



**Clean Air  
Partnership**

CLIMATE SOLUTIONS WEBINAR SERIES





# Clean Air Partnership

CLIMATE SOLUTIONS WEBINAR SERIES



## WEBINAR SERIES - UPCOMING:

- Electrified buses, trolleys and inner-city transit planning
- Carbon accounting for governments & businesses
- Sewage heat recovery & community energy

# THANK YOU

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