


# Renewable Energy and Conservation

Fond du Lac Band of Lake Superior Chippewa's steps towards energy sustainability.

1/31/2018 Renewable Energy and Conservation 1

## Presentation Outline

- Strategic Energy Plan
- Commercial Scale Renewable Energy
- Residential Scale Renewable Energy
- Energy Conservation
- Environmental Benefits
- Challenges
- Conclusion



1/31/2018 Renewable Energy and Conservation 2


## Strategic Energy Plan

- **Energy Efficiency Options:** Identify potential for energy \$ savings.  
Energy Audits, bench marking, energy code and energy efficient design.  
Retrofit projects: band owned homes, rentals and commercial buildings
- **Energy Generation Options:**  
Solar: 1 megawatt, 13 kilowatts  
Biomass: 100,000 btu and 1,700,000 btu district heat  
Diesel: 6 megawatts
- **Institutional and Administrative Options:**  
Tribal Utility: propane, electric and NG transmission & distribution, R/W  
Department of public works, broadband, sewer and water division  
Vehicle fleet plan, fuel purchase plan and electric rate options

1/31/2018 Renewable Energy and Conservation 3

## Commercial Scale Renewable Energy-Sawyer Community Center Biomass Boiler


- 1.7 MMBtu biomass boiler.
- Wood chips will replace 88% of propane use.
- Reduce propane use by 13,295 gallons per year.
- Saving approximately 85 tons of CO2 per year.



1/31/2018 Renewable Energy and Conservation 4

## Commercial Scale Renewable Energy-Sawyer Community Center Biomass Boiler


- Javo toploader wood chip feed system.
- In-floor air drying wood chips before they are fed into the boiler.
- 132 tons of wood chips a year



1/31/2018 Renewable Energy and Conservation 5

## Commercial Scale Renewable Energy- BCCR Solar Site.

- Black Bear Casino and Resort 1 Mega-Watt, 5 acre solar array went online August 22, 2016.
- Utilizing 3,230 Trina solar panels and 38 ABB string inverters, the solar field has offset Black Bear Casino's total energy use by about 8%.
- First year production totals exceeded 1.2 GWh of energy.
- As of August of 17' the solar site has saved Black Bear Casino and Resort approximately \$83,000.



1/31/2018 Renewable Energy and Conservation 6

### Commercial Scale Renewable Energy- Visual

1-Year Black Bear Casino Electrical Energy

1/31/2018 Renewable Energy and Conservation 7

### Residential Scale Renewable Energy:

- The Environmental program also developed strategies to bring renewable energy to residential properties that are located inside the reservation borders.

1/31/2018 Renewable Energy and Conservation 8

### Residential Scale Renewable Energy:

- To date 5-residential solar electrical and 7-solar hot air systems have been installed.

1/31/2018 Renewable Energy and Conservation 9

### Residential Scale Renewable Energy:

- Out of the 5 solar electrical systems, 4 systems are 3kW total energy offset systems.
- The 5<sup>th</sup> system is unique because it's a 1.5kW DC system that feeds a domestic hot water tank.
- Together they all total 13.5 kW of renewable solar energy.

1/31/2018 Renewable Energy and Conservation 10

### Energy Conservation

- Fond du Lac's Environmental Program has advocated to reduce their Carbon Footprint by using the energy conservation approach on Band owned buildings.

1/31/2018 Renewable Energy and Conservation 11


### Energy Conservation

- Fond du Lac facilities management staff have recognized the need for energy conservation and actively participated in measures to meet these goals.

1/31/2018 Renewable Energy and Conservation 12

## Energy Conservation


- In 2010, Resource Management Division constructed the first LEED building in Carlton County. The building has offset its energy use by installing a 12-kW solar system, employed passive lighting, and solar reflective tubes for interior lighting.



1/31/2018 Renewable Energy and Conservation 13

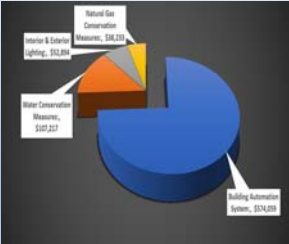
## Energy Conservation: Noresco Project

- The Environmental Program partnered with Noresco to perform an energy savings audit on Fond du Lac owned buildings.
- Twenty four buildings were identified with the greatest need for energy conservative measures.
- The energy conservative measures included water, interior/exterior lighting, boilers, controls, and air handling units.



1/31/2018 Renewable Energy and Conservation 14

## Noresco Savings Breakdown



- The annual savings total equates to \$772,403.
- That means the Fond du Lac Band will save approximately \$64,366 per month.
- The total payback of the project is 6.1 years.
- The project alone can account for up to 25% energy savings.

1/31/2018 Renewable Energy and Conservation 15

## Commitment to Efficiency



- Since 2003, the Fond du Lac Band of Lake Superior Chippewa have been committed to energy efficiency and carbon offset projects while living in a seasonably harsh climate.

1/31/2018 Renewable Energy and Conservation 16


## Brief History of Conservation

- In 2003 Fond du Lac worked with Minnesota Power in creating up to 25 energy efficient homes.
- In 2004 the Environmental Program installed a 65 ft. anemometer tower to provide wind energy data.
- In 2007 the Fond du Lac Band adopted the Kyoto Protocol which pledges that 20% of the band electrical energy use would come from renewables.
- In 2012 Fond du Lac worked partnered with Minnesota Power to conduct energy saving audits on commercial buildings resulting in a 15% reduction.
- In 2013 a 100,000 BTU was installed at Fond du Lac's recycling operation at the waste transfer station.

1/31/2018 Renewable Energy and Conservation 17

## Challenges

- Climate Zone
- Feasibility
- Measurement and verification
- Funding Source
- Robust Decisions and Designs
- Inventory Management
- Education and Outreach
- Utilities
- Maintenance



1/31/2018 Renewable Energy and Conservation 18

## Conclusion

Renewable energy and conservation will continue to be an important topic for the Fond du Lac Band. With continued funding and staff efforts we can achieve complete sustainability and more. Benchmarking both residential and commercial buildings we can continue to cut costs and emissions. Our continued community outreach and education will help us remain a leader in the efforts to cut CO<sub>2</sub> emissions. Those efforts are noticed by state and federal elected officials who will continue to push for funding renewable energy projects and conservation.



1/31/2018

Renewable Energy and Conservation

19

## Questions ?

Resource Management Division,  
Wayne Dupuis  
Environmental Program Manager  
Phone: 218-878-7106  
[Waynedupuis@fdlwez.com](mailto:Waynedupuis@fdlwez.com)

Bruno Zagat,  
Energy Projects Manager  
Phone: 218-878-7165  
Fax: 218-878-7168  
[Brunozagat@fdlwez.com](mailto:Brunozagat@fdlwez.com)

Steve Douglas,  
Electrical Engineer  
Phone: 218-878-7144  
Fax: 218-878-7168  
[Stevedouglas@fdlwez.com](mailto:Stevedouglas@fdlwez.com)



1/31/2018

Renewable Energy and Conservation

20