

# Strategies for Remote Microgrids in the Northwest Territories



PNWER 2015 ECONOMIC LEADERSHIP FORUM

Energy and Environment Working Group

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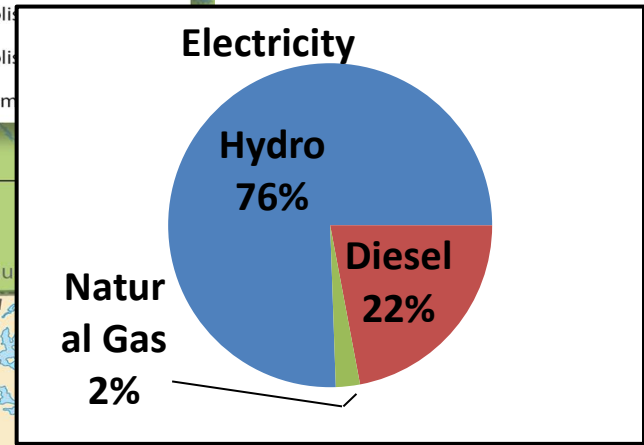
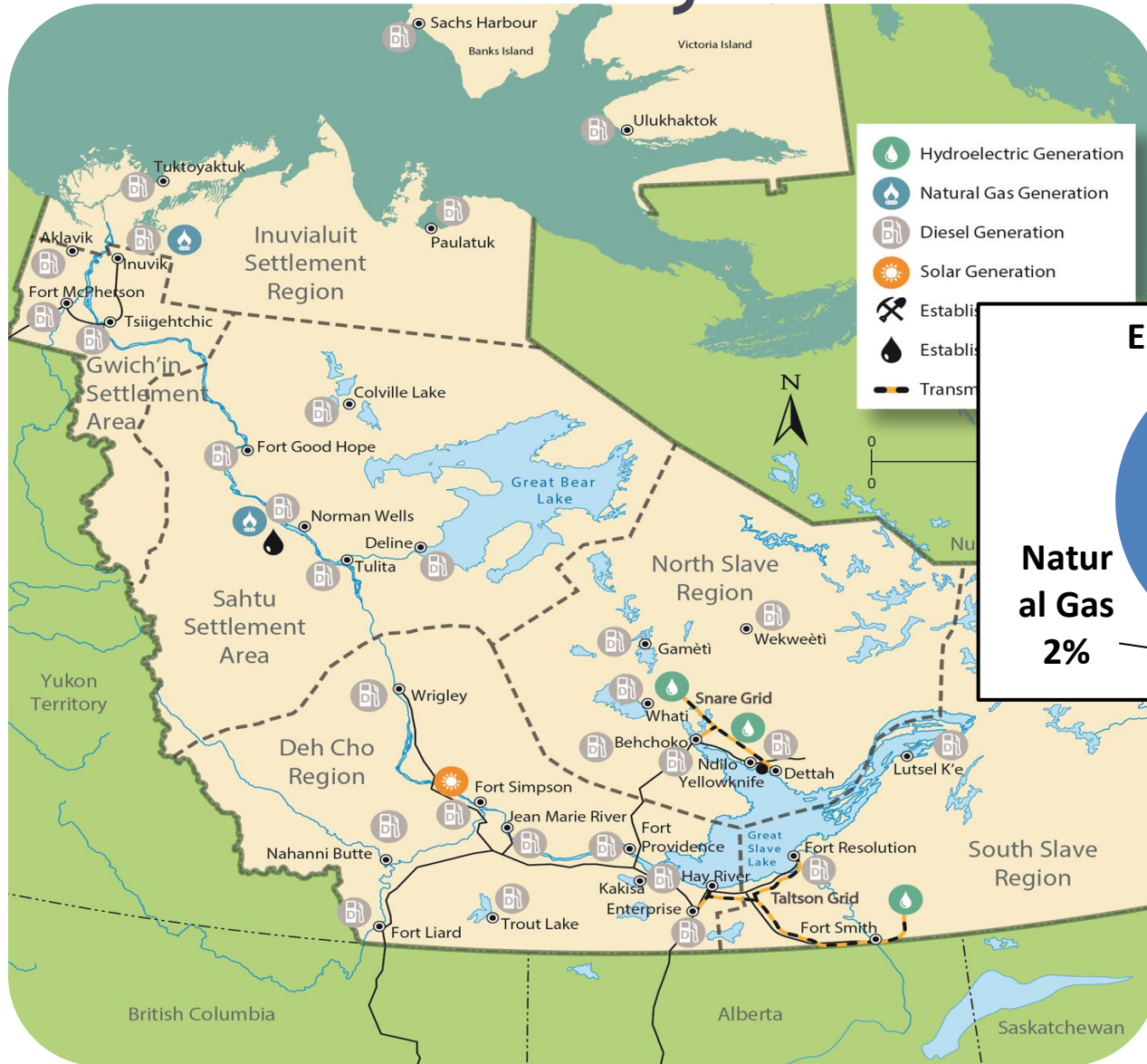
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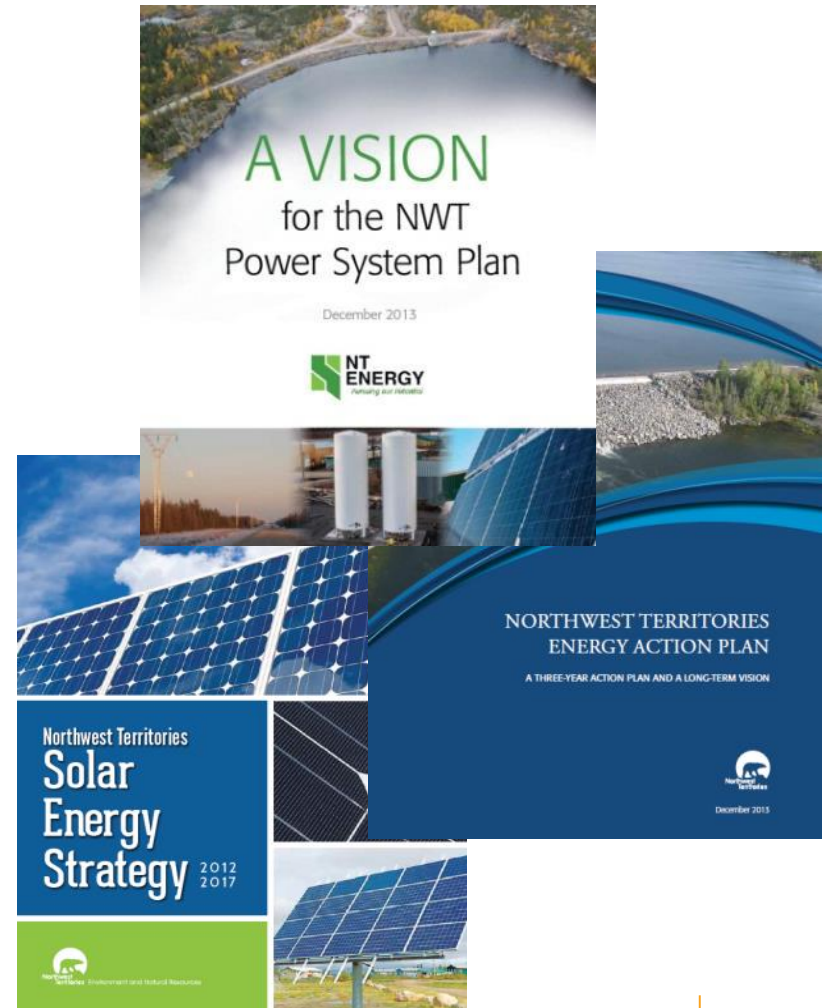


# NWT Community Generation



# NWT Energy Direction

- Change Status Quo
- Stabilize Costs
- Identify Alternative and Renewable Options
- Identify 3-year Funding
- Solar Strategy includes:
  - Residential
  - Commercial
  - Utility Scale



# Fort Simpson

- Located: Deh Cho
- Population: 1,200
- Average Load: 950kW
- Peak Load: 1,500kW
- Road Access year-round
- Seasonal barge access





# 104kW Solar PV - Fort Simpson

## Achievements:

- Saves 27,900 L diesel fuel or 76 tonnes GHG / Yr.
- First Utility-Scale Low Penetration (12% average community load)

## Limitations:

- Solar production is less than 2% annual consumption
- 2.2 million L / Yr. in diesel fuel required to meet load



# Colville Lake



Located: Sahtu Region

745 km by air NW of Yellowknife

Population: 147

Average Load: 50 kW

Peak Load: 150 kW

Diesel among most expensive

Summer months air access only;  
winter road 4-6 weeks

# Old Power Plant

- Oldest NTPC plant: 24 years
- Lower efficiency generators
- Settling issues
- Reliable, stable power challenging to provide
- Community growing in size
- No longer meeting (Required Firm Capacity)
- Middle of Community



# New Approach

- New high efficiency Generators
- Maximize solar as possible to offset costly diesel
- Batteries for stability and renewables
- Ability to run entirely on Solar and Batteries
- Move plant from community core
- Simplify construction





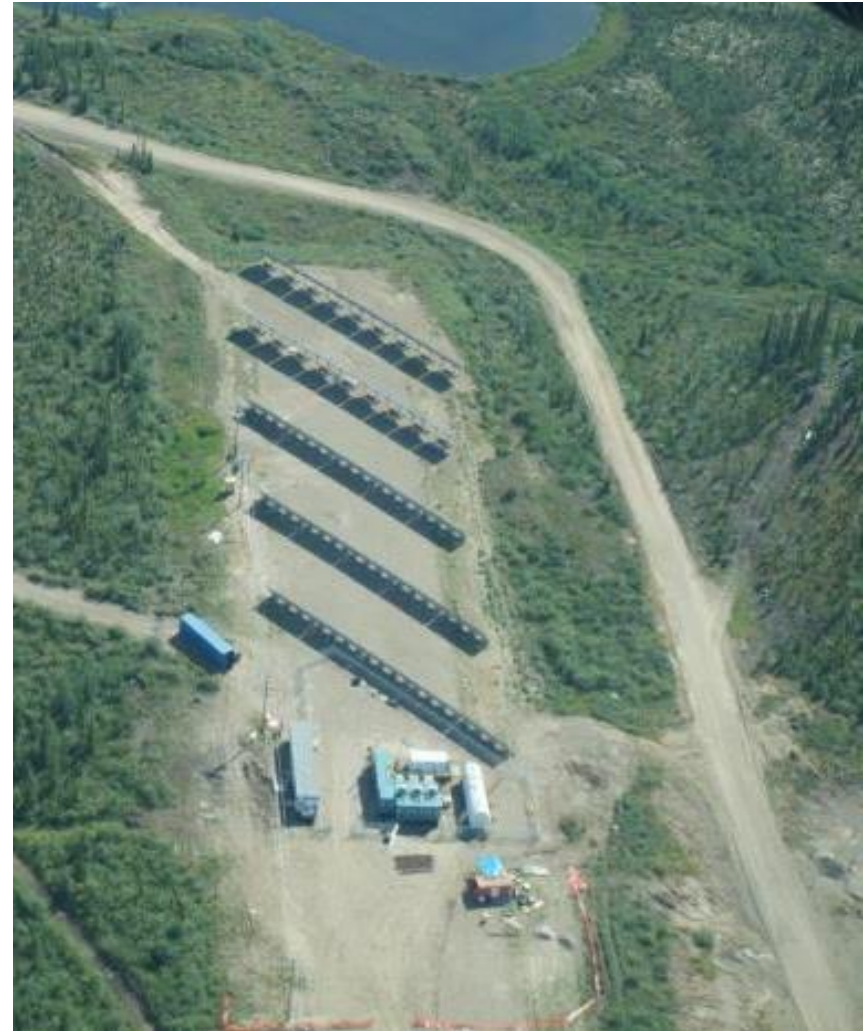
# Construction

- Small Community: Modular Construction, local labour
- Remote Location: Advance Testing
- Challenging Logistics: Careful Planning



# 136.5kW Solar PV - Colville Lake

- 112MWh expected solar generation
- On Schedule/On Budget
- Capacity building / relationship building
- Cost/ kW lower than previous projects \$6.34/W
- 20% Fuel Reduction , 86 tonnes GHG/yr
- Average diesel consumption is 160,000L



# Beyond Colville Lake

	Technology	0-5 Years	6-20 Years
DIESEL REPLACEMENT (Firm Power)	Community Hydro Extensions	3 communities	+2 all season road communities
		4 all season road communities	+5 all season road communities
DIESEL OFFSET (intermittent)		4 winter road communities	+18 winter road communities
		2 all season road communities	+4 winter road communities