





## Antarctica New Zealand Energy Initiatives – An overview




Iain Miller  
Manager Operations and Logistics  
Antarctica New Zealand

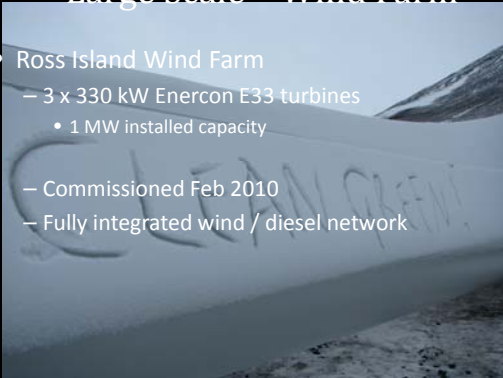
## Energy Reduction Initiatives

- Large scale
- Medium scale
- Small scale


## Large Scale – Wind Farm

- Ross Island Wind Farm
  - 3 x 330 kW Enercon E33 turbines
  - 1 MW installed capacity
  - Commissioned Feb 2010
  - Fully integrated wind / diesel network




## Large Scale – Wind Farm

- McMurdo Station (USA) + Scott Base (NZ)
  - Combined demand up to 1.7MW
  - All energy prior to wind farm = diesel generators
- Excellent wind resource (Avg 8m/s laminar)




## Large Scale – Wind Farm

- Estimated fuel savings (US + NZ combined) 450,000 – 500,000 litres (120,000 – 130,000 gallons)
- Maximum penetration to date 70%
- Average capacity factor\* 35%
  - (World average 25%, Best in world 50%)



\*Capacity factor = % of theoretical maximum

## Medium Scale



- Certified Emissions Measurement and Reduction (CEMARS)
- Antarctica NZ was certified for the first time in June 2010.
- CEMARS is an internationally recognized standard – World's first Green House Gas certification scheme.
- It is the first 2 out of 3 steps toward Carbon Neutrality.

## Medium Scale

- CEMARS
  - Commitment to understanding our carbon footprint and reducing it.
  - Agreed target reduction in CO<sub>2</sub> emissions (18%)
- Focuses on use of high emitters
  - Air cargo
  - Helicopters
  - Heating

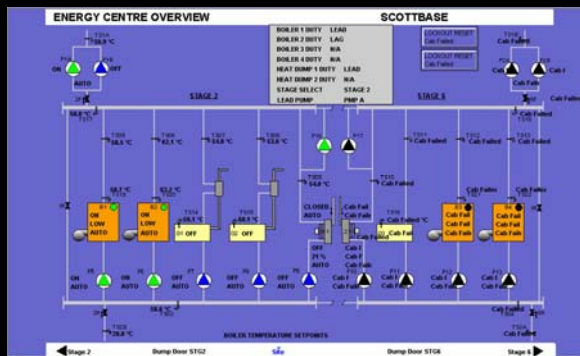
## Medium Scale

- Building Management System (BMS) at Scott Base
  - “Intelligent” control of air flow, heat, exhaust and mechanical controls.
  - Accurate measurement of energy flow and consumption

### ENERGY STATS BAR

29/03/2010

<b>WATER CONSUMPTION</b>	
Litres Per Person	108 L
7 Day Average	112 L
Target	120 L
<b>ELECTRICITY USAGE</b>	
Base Consumption	2044 kWh
Imported Energy	2044 kWh
<b>HEAT ENERGY USE</b>	
Base Consumption	2159.8 kWh
Average Outside Temp	-26.0 C
Performance Factor	50.02
<b>HFC CARGO DOOR</b>	
Times Opened	3
Total Time Open	0:05:31
Average Open time	0:01:50
<b>TOTALS</b>	
Energy Consumed*	4244
Renewable Fraction	48%
<small>*Does not include vehicles or helicopter</small>	
Vehicle Fuel Used	0
Base Fuel Used	620



## Small Scale

- Project “Energy Freeze”
  - Analyzed detailed energy flow and usage.
  - Looks at behavioral (non-technical side) of energy management.
  - What can people do themselves to reduce energy?



## Small Scale

- “My Sustain Report”
  - Interactive tool to learn about energy and how to minimize your individual footprint.
  - All people travelling to Scott Base.
- Energy Display screen at Scott Base with real time energy consumption data
  - E.g. Water use, food waste etc.

