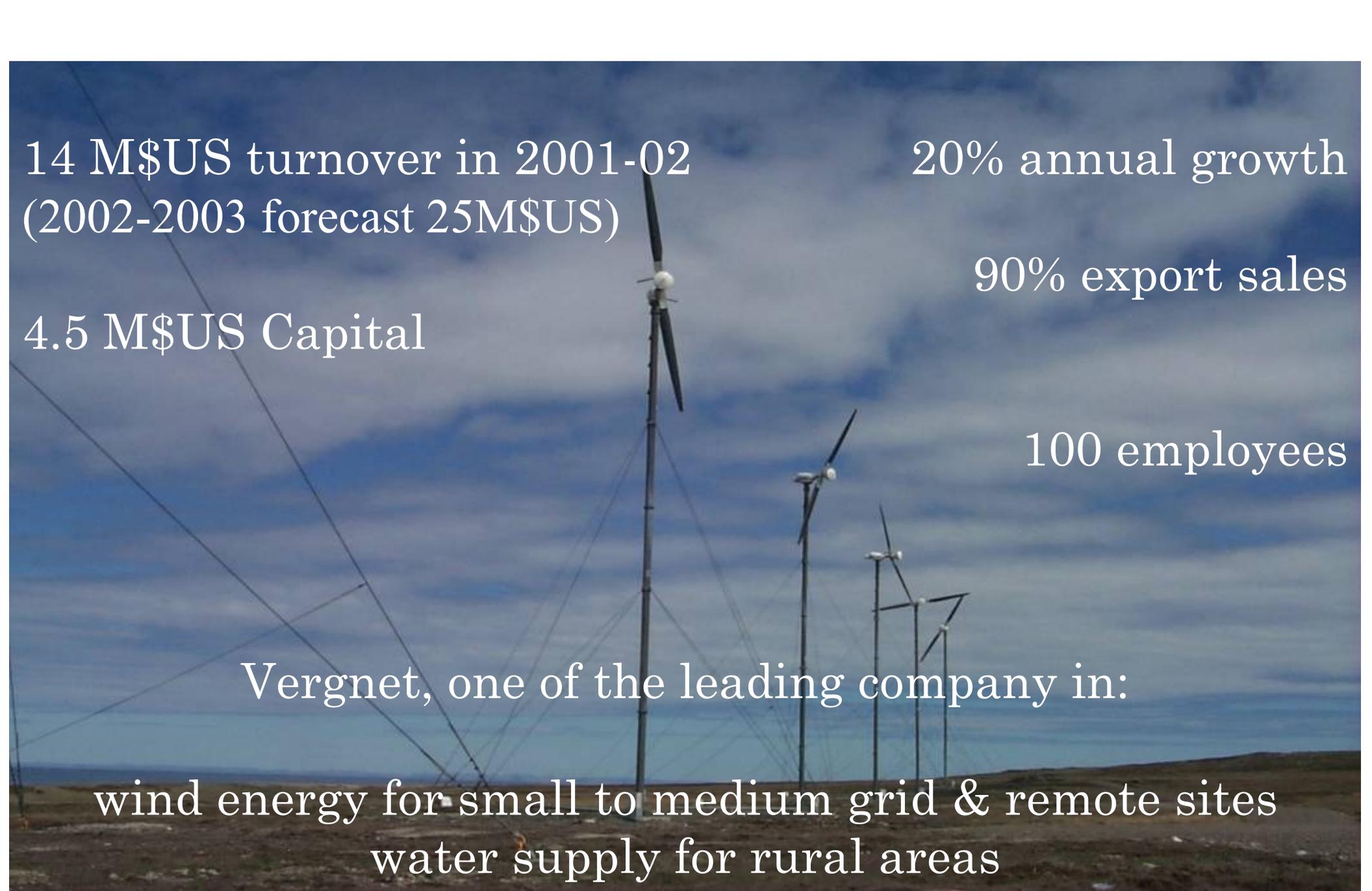




600 kW Wind Farm on Miquelon Island Diesel Grid (South of Newfoundland)

Wind-Diesel 2002 Workshop
Anchorage, Alaska - September 23 and 24, 2002

Vergnet Canada Ltd.



14 M\$US turnover in 2001-02
(2002-2003 forecast 25M\$US)

20% annual growth

4.5 M\$US Capital

90% export sales

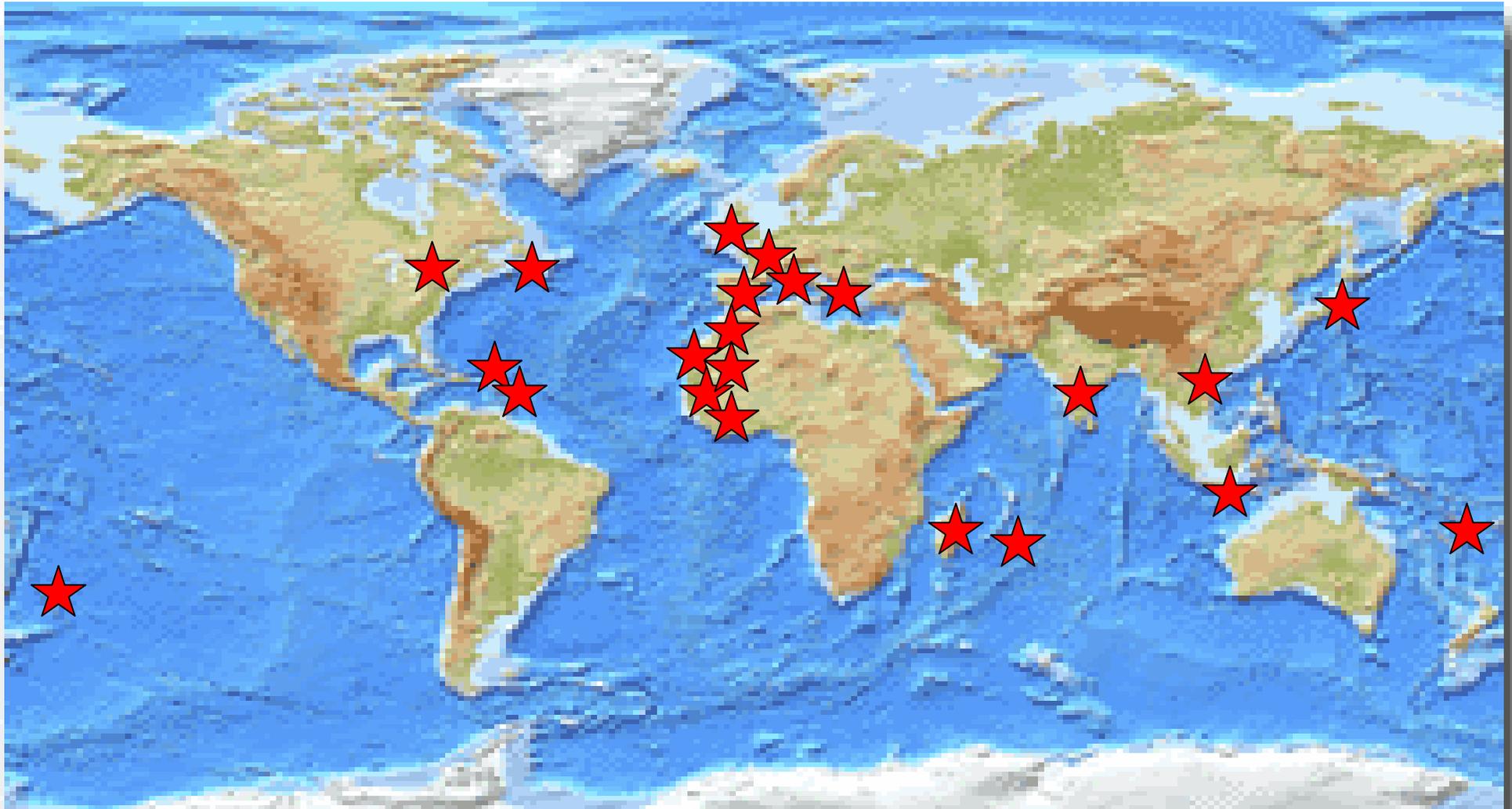
100 employees

Vergnet, one of the leading company in:

wind energy for small to medium grid & remote sites
water supply for rural areas

Vergnet SA presentation & key numbers

Vergnet Canada Ltd.



17 subsidiaries - 20 agencies - 120 spare parts stores

Vergnet presence around the world

Vergnet Canada Ltd.

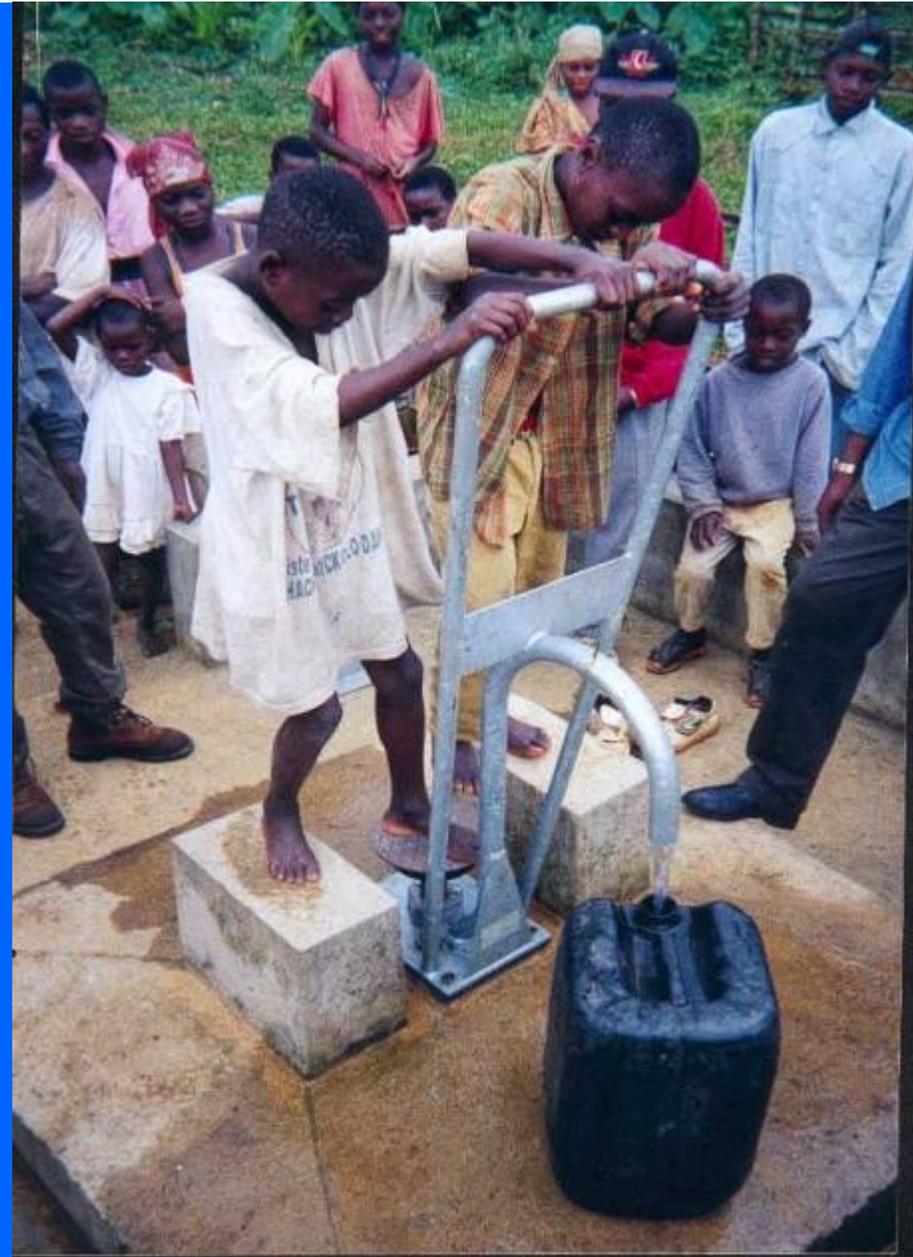
Pumping, sanitation, distribution systems for 40 million people in Africa

Simple and reliable products

Pumping depth down to 100 meters

3,000 pumps produced per year

50,000 pumps installed



Water supply products & systems

Vergnet Canada Ltd.

Wind energy products & systems



GEV29/275

GEV26/220

GEV15/60

GEV10/20

GEV7/10

GEV5/5

GEV4/2

Complete range of wind turbines and systems

2 to 275 kW rated power
4 to 29 meter rotor diameter

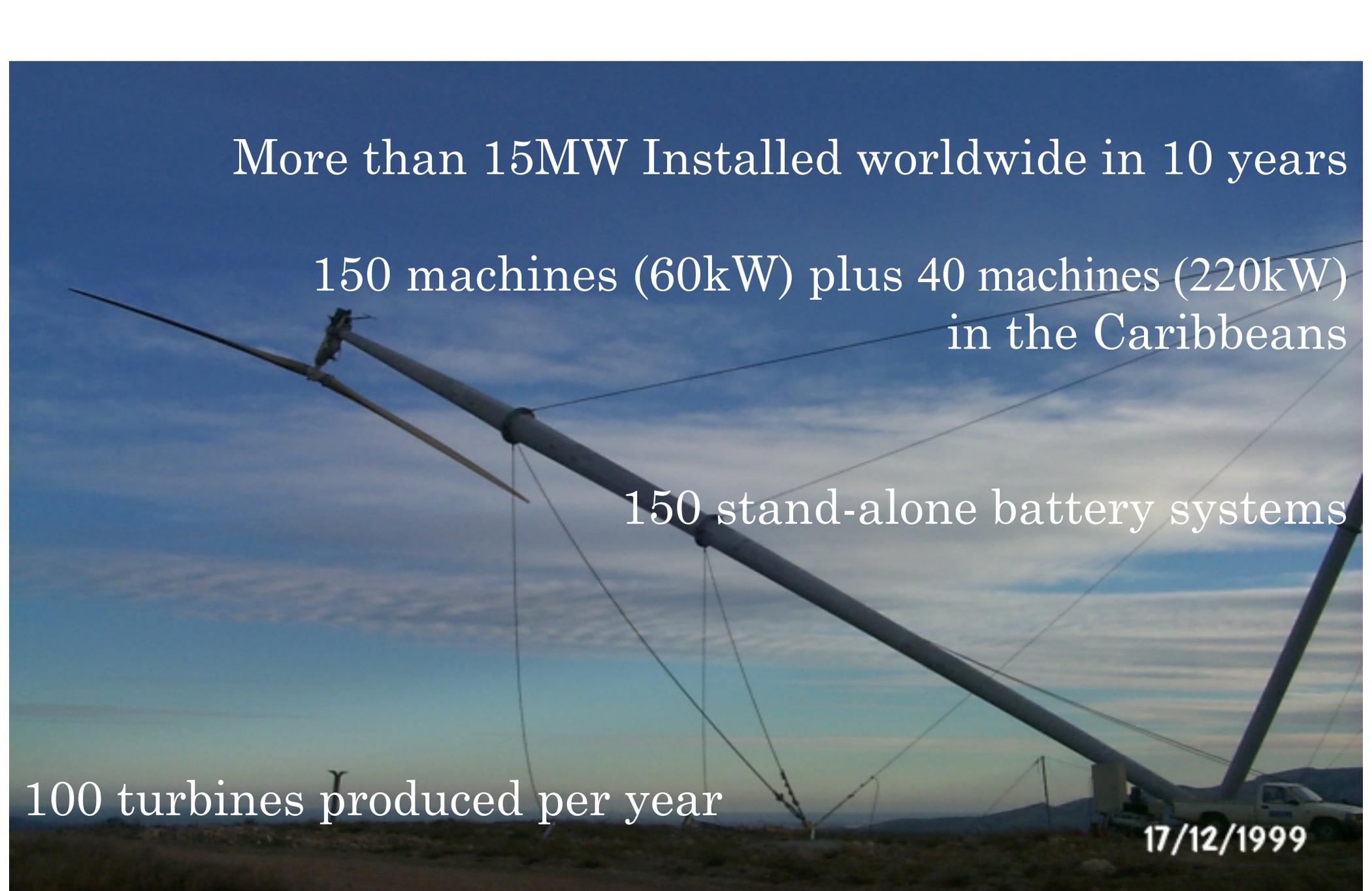
Stand-alone battery charging

Hybrid wind diesel

Grid connection

Water pumping

Vergnet Canada Ltd.



More than 15MW Installed worldwide in 10 years

150 machines (60kW) plus 40 machines (220kW)
in the Caribbeans

150 stand-alone battery systems

100 turbines produced per year

17/12/1999

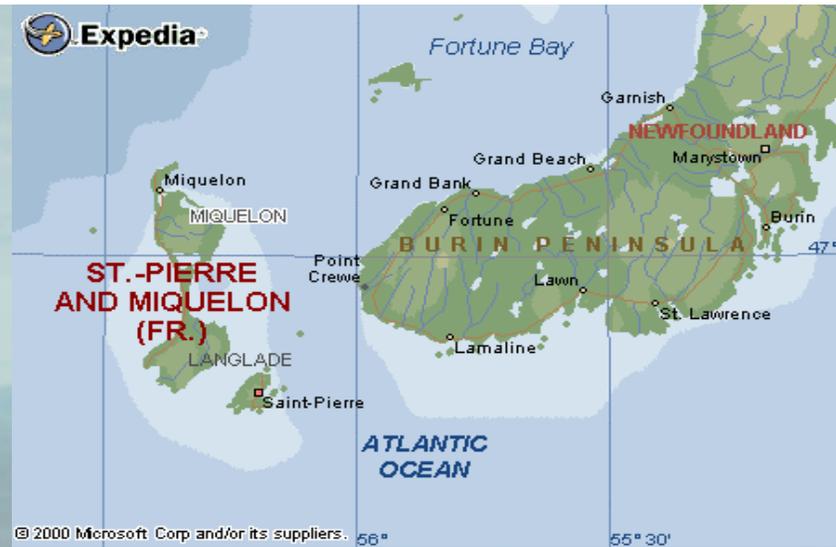
Wind energy products & systems

Vergnet Canada Ltd.



Miquelon

47°N – 56°25' W
700 inhabitants
main activity fishing



Wind farm



Diesel power plant

No electrical cable between Saint-Pierre and Miquelon

Project granted in 1997 by EDF under the EOLE 2005 program

Installation started in June 1999

First connection on the grid in April 2000

Wind turbine type: GEV15/60

Rotor diameter: 15 m

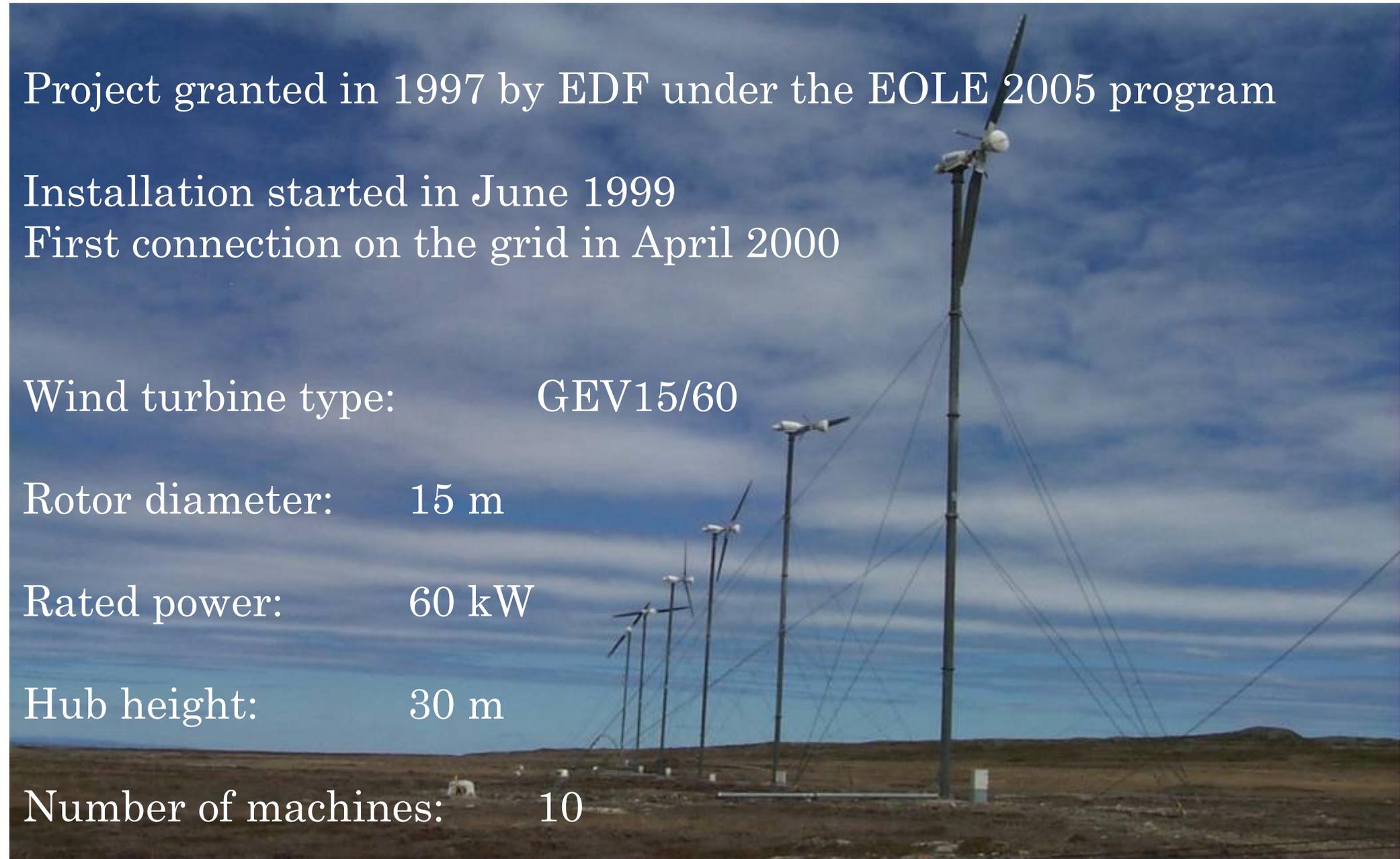
Rated power: 60 kW

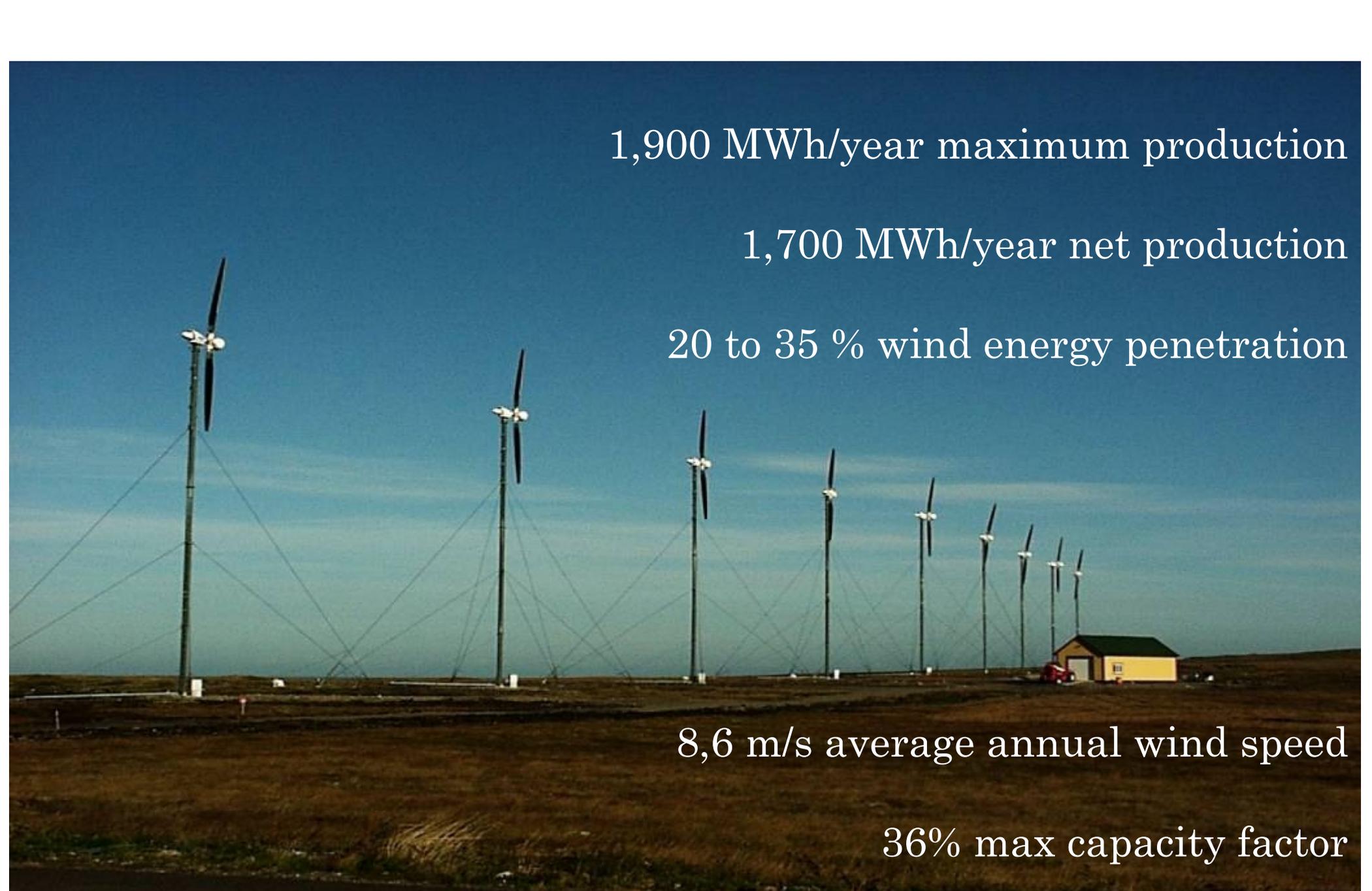
Hub height: 30 m

Number of machines: 10

Miquelon wind diesel project

Vergnet Canada Ltd.





1,900 MWh/year maximum production

1,700 MWh/year net production

20 to 35 % wind energy penetration

8,6 m/s average annual wind speed

36% max capacity factor

Miquelon wind diesel project

Vergnet Canada Ltd.

15 m rotor diameter
60 kW rated power
92 rpm rotor speed

30 or 40 m tower

5 m/s cut-in
15 m/s rated
25 m/s cut-out

2,400 kg nacelle
(5,300 lbs)

6,500 kg tower
(14,300 lbs)

Active stall off-grid rotor speed control

Downwind 2 bladed teetering hub

Passive stall power limitation

Soft starter grid connection

Tilttable tower

Passive yaw

GEV15/60 Wind Turbine

Vergnet Canada Ltd.



Light weight for easy shipping and transportation

Designed for easy installation and maintenance

GEV15/60 Wind Turbine

Vergnet Canada Ltd.

GEV15/60 Wind Turbine

Parking brake

Asynchronous generator

Cast aluminium frame

IP55 protection

1,500 rpm for 50 Hz grid

1,800 rpm for 60 Hz grid

Integrated drive train

with 2 stage planetary

gearbox

7.5 m Epoxy glass fibber blades

Vergnet Canada Ltd.



GEV15/60 soft starter

Specially adapted thyristors soft starters

Smart speed and power measurements

Reliable and smooth connection to the grid at start-up

Continuous connection to the grid even in low wind

Vergnet Canada Ltd.



GEV15/60

cold climate adaptations



High ductibility
high impact
low temperature steel

Specially designed reinforced
structure

High viscosity
low temperature synthetic
lubricants

IP55 sealed generator heated by
soft starter

Drift snow protected nacelle

Vergnet Canada Ltd.

Low temperature silicon rubber
and elastomers for seals

Black coated blades

Stall strips on leading
edge of blades to limit
the power due to high
air density

Special coatings for low
temperature salty
environment

GEV15/60 cold climate adaptations

Vergnet Canada Ltd.

New plant: 2 x 1200 kW WARTSILA
1 x 800 kW WARTSILA

Old plant: 4 x 500 kW POYAUD

Total: 5200 kW

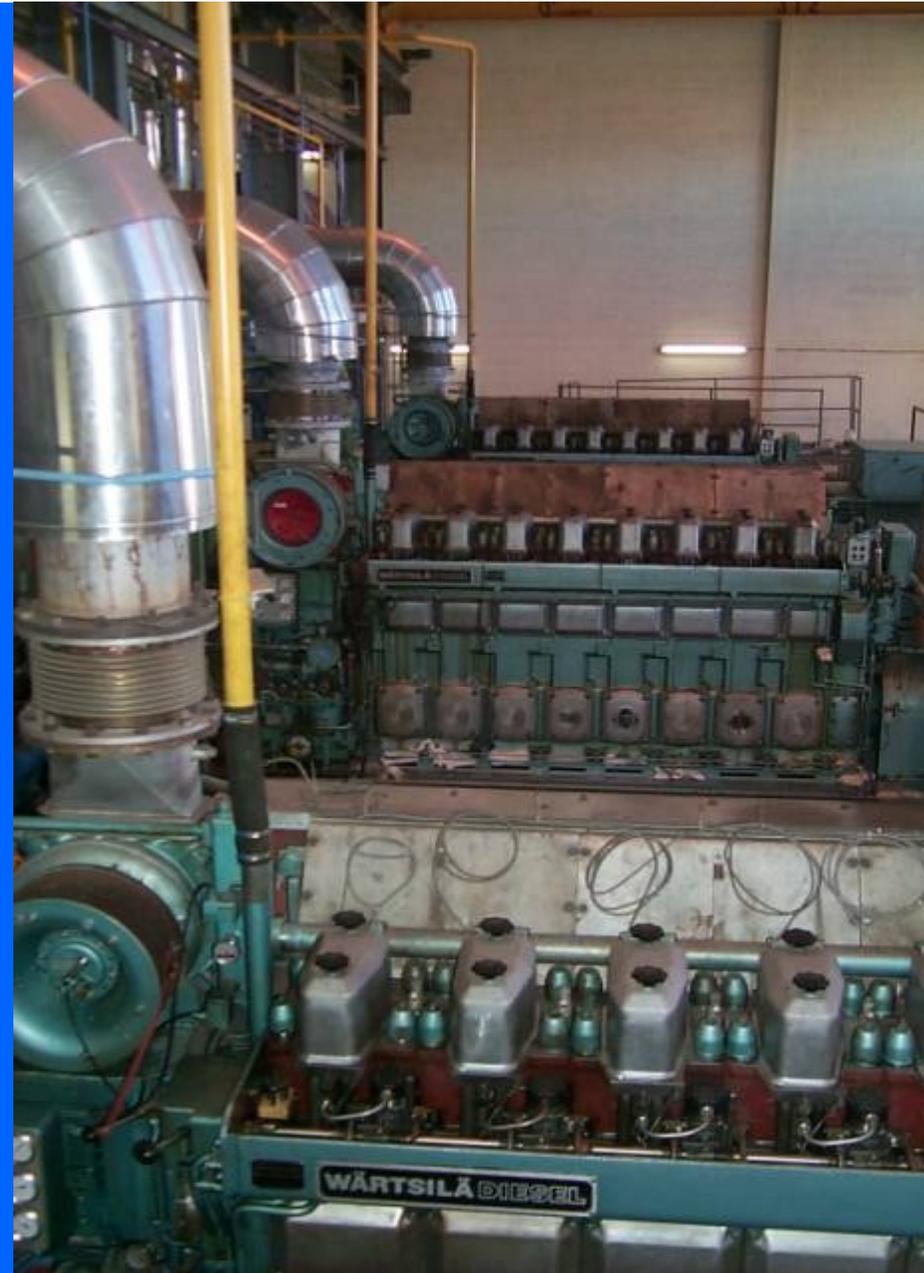
5800 to 6000 MWh of energy delivered
per year

1250 kW maximum power load

700 kW average power load

450 kW minimum power load

35 to 50% minimum load on running diesel



Miquelon diesel power plant

Vergnet Canada Ltd.



Miquelon wind diesel project

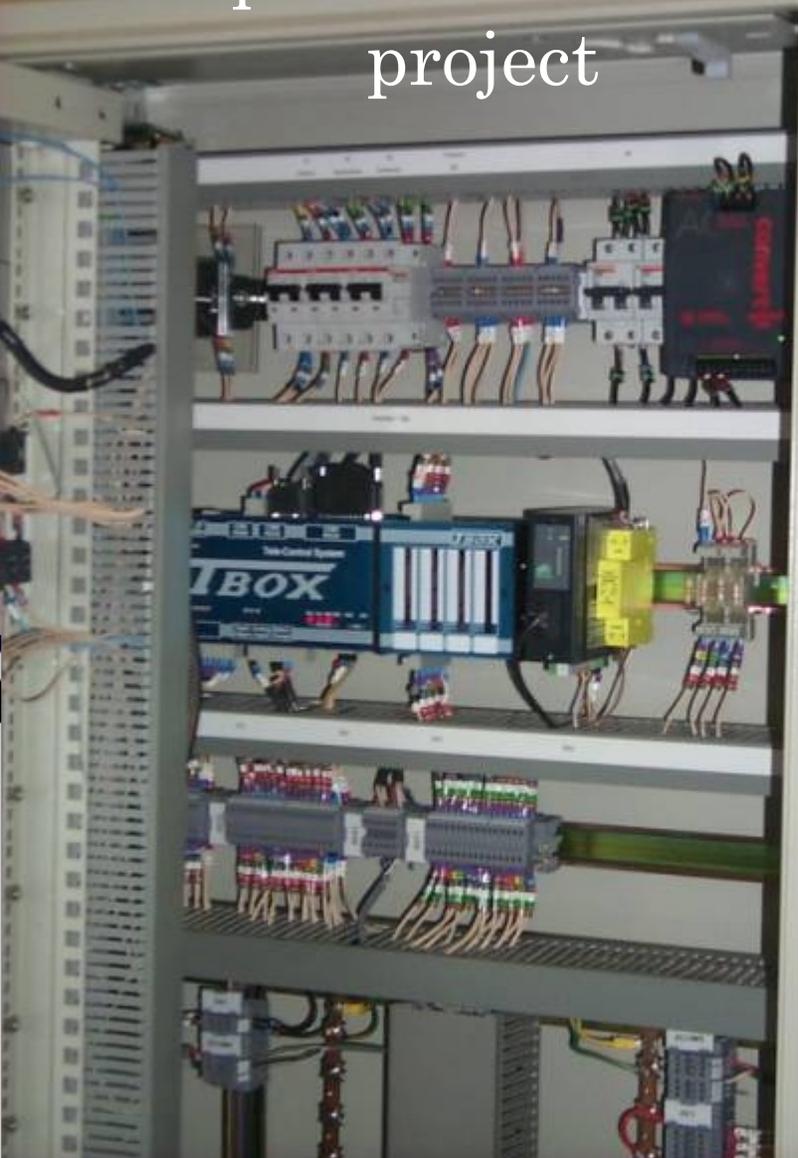
652 kW generated by the diesel generator

225 kW generated by 5 wind turbines

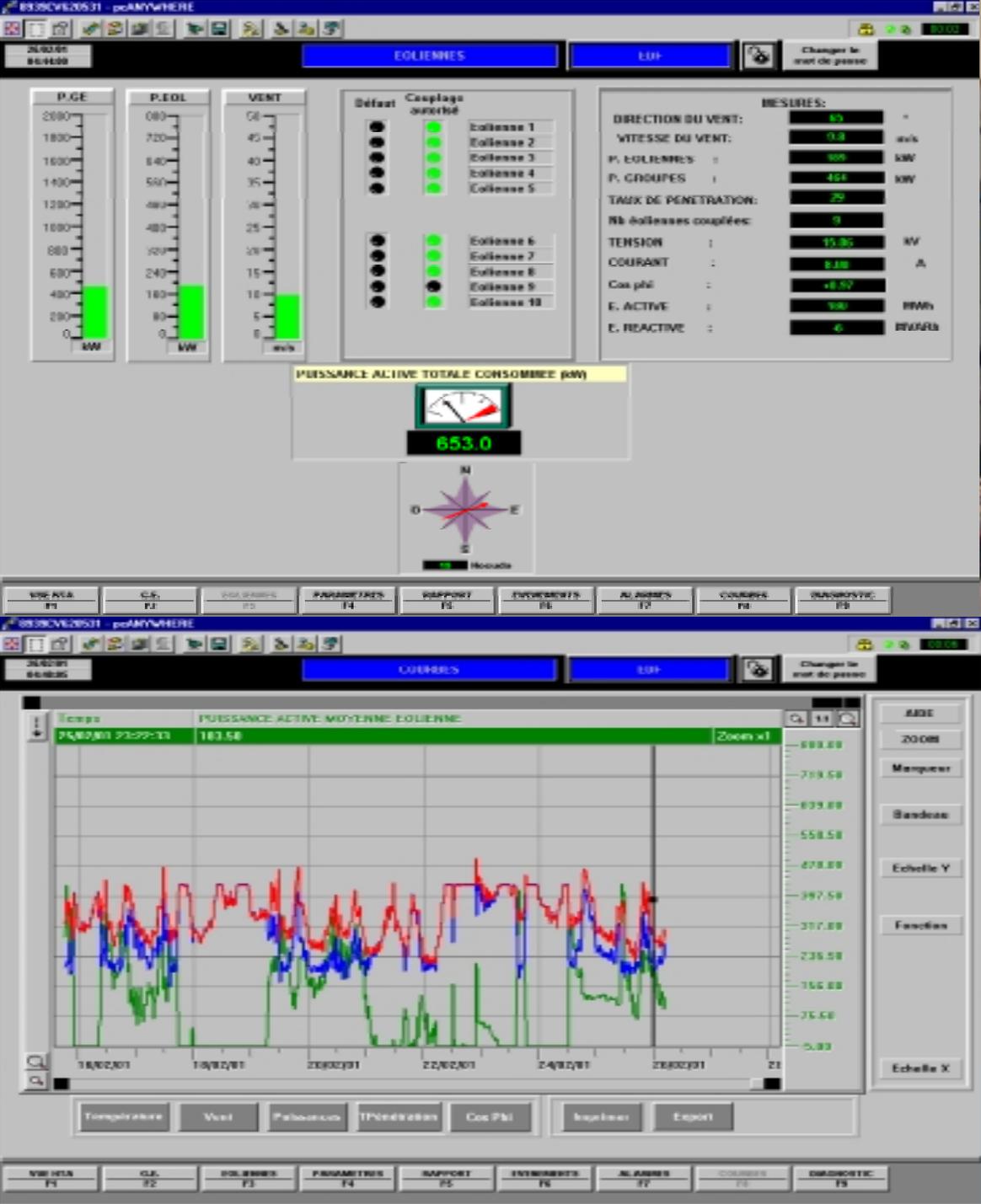
877 kW load demand on the grid

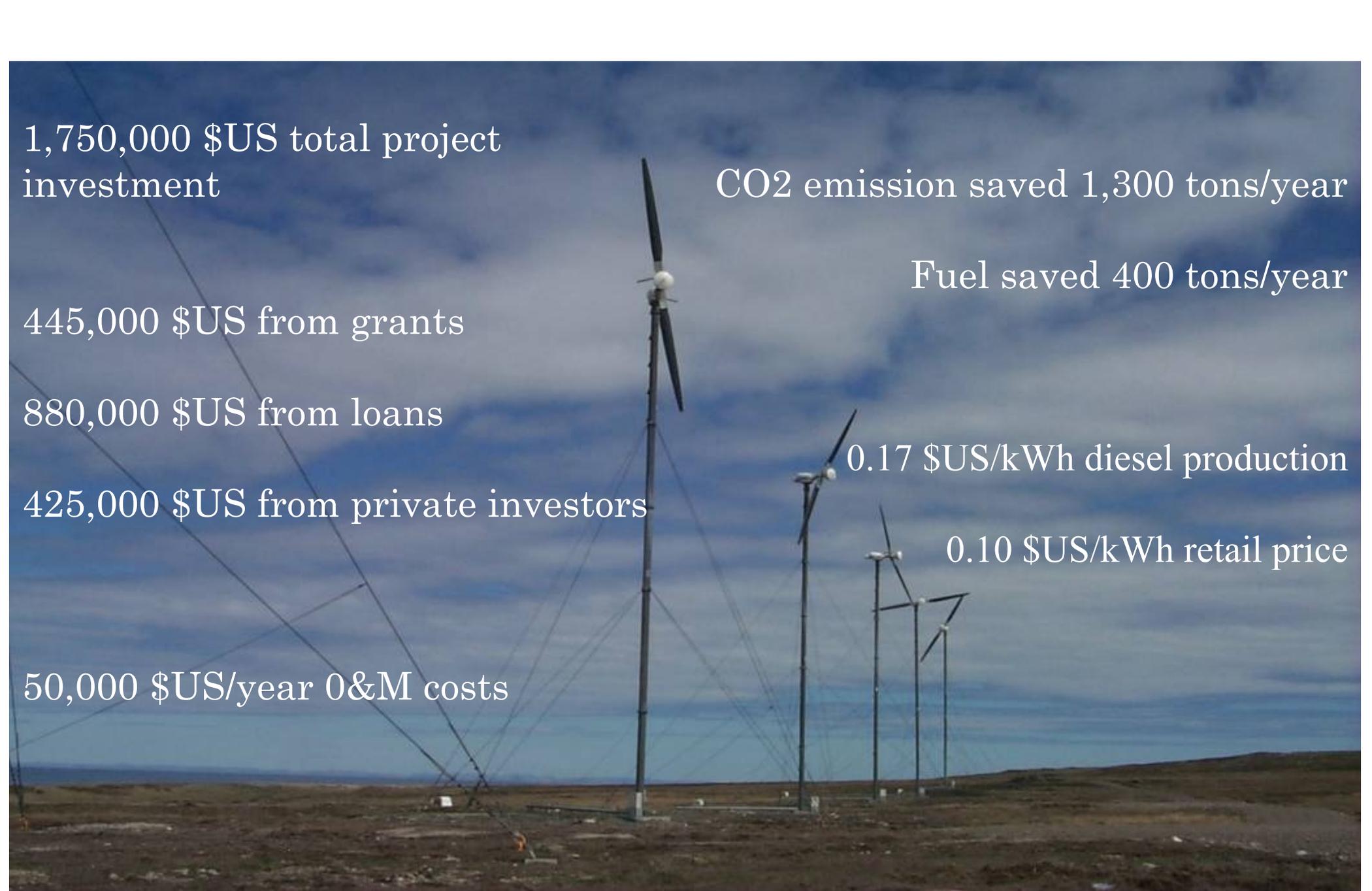
Wind energy injected to the grid depending demand and min diesel load

Miquelon wind diesel project



Vergnet Canada Ltd.





1,750,000 \$US total project investment

445,000 \$US from grants

880,000 \$US from loans

425,000 \$US from private investors

50,000 \$US/year O&M costs

CO2 emission saved 1,300 tons/year

Fuel saved 400 tons/year

0.17 \$US/kWh diesel production

0.10 \$US/kWh retail price



Typical standalone battery charging system

Automatic centralized energy management

Diesel cycling depending wind energy, load demand & battery state of charge

28/7/1999

Vergnet Canada Ltd.

GEV29/275 Wind Turbine

29 m rotor diameter
275 kW rated power
50 m or 60 m tower
46 rpm rotor speed

5 m/s cut-in, 25 m/s cut-out

Nacelle: 8 tons

Tower: 10 ton

Heaviest component: 2 tons

Transport in 40 ft containers

70 machines (220kW)
installed in 2000-2002

40 machines (275kW)
on order for 2003

Vergnet Canada Ltd.



GEV29/275 Wind Turbine

Downwind 2 bladed teetering hub

Passive yaw

Pitch control power limitation

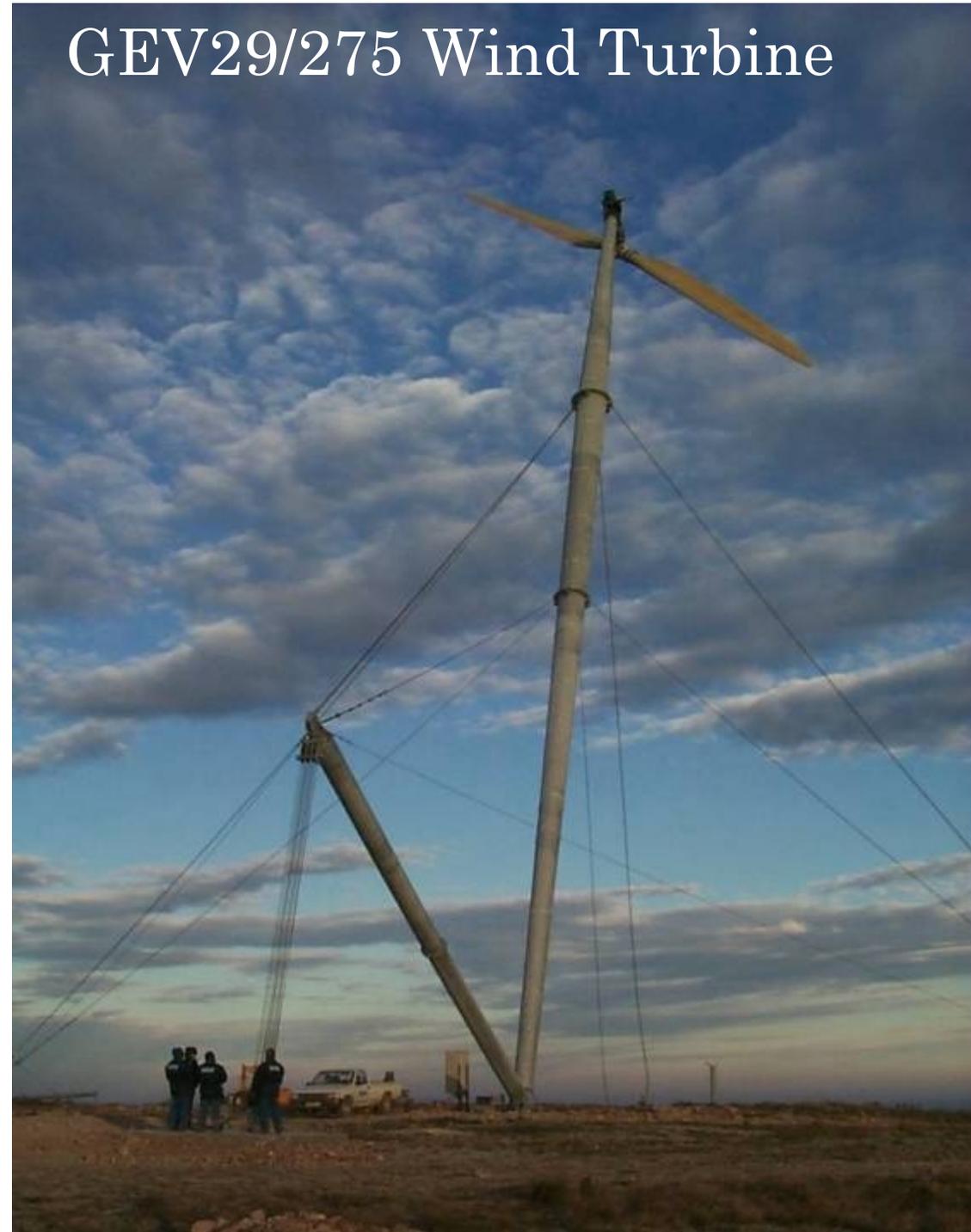
Aerodynamic brake

High speed shaft emergency disk
brake

Lattice or tubular tiltable towers

Soft starter wind-diesel or grid
connection

Vergnet Canada Ltd.



Vergnet Canada Ltd.

Venture created mid 2001 between
Wenvor-Vergnet Canada Inc. &
Vergnet S.A.

Local adaptation, local production of a
complete range of wind turbines
10kW – 20kW – 60kW
(275kW in 2003)

Assembly plant near Toronto

Participation of NRCan
in the 10kW and 60kW projects

Sales & Marketing for Canada, Alaska
and USA

Vergnet Canada Ltd.





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Wind-Diesel 2002 Workshop - Séminaire Éolien-Diesel 2002
Anchorage, Alaska - September 23 and 24, 2002

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