



# **Commercial Applications for Small Wind Systems**

***Southwest Windpower, Inc***

Andy Kruse

# Small Residential/ Commercial Wind



Entegrity Wind  
50KW



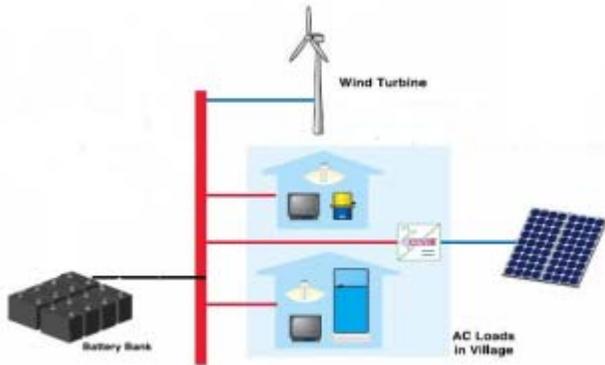
Northern Power Systems  
100KW



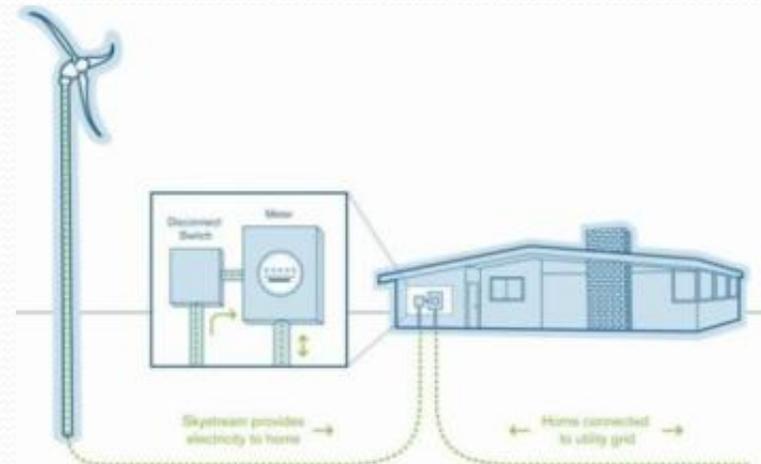
Southwest Windpower  
2KW

Small wind is typically identified as a wind turbine with a rating of 100KW or less and works on the retail side of the meter

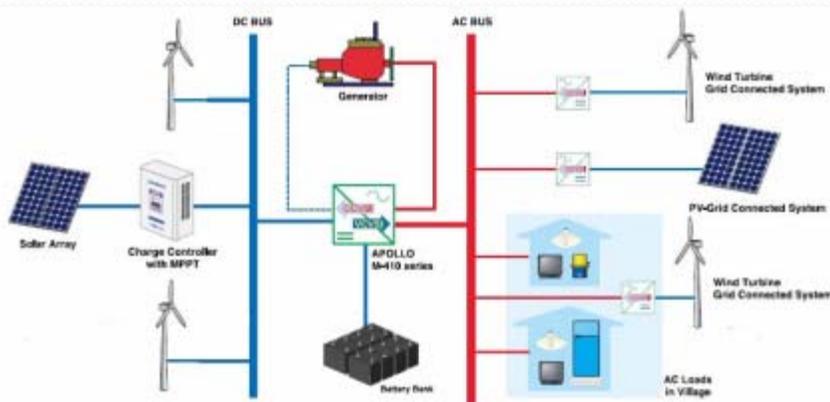
# How Small Wind Systems are Used



Remote Stand-alone system



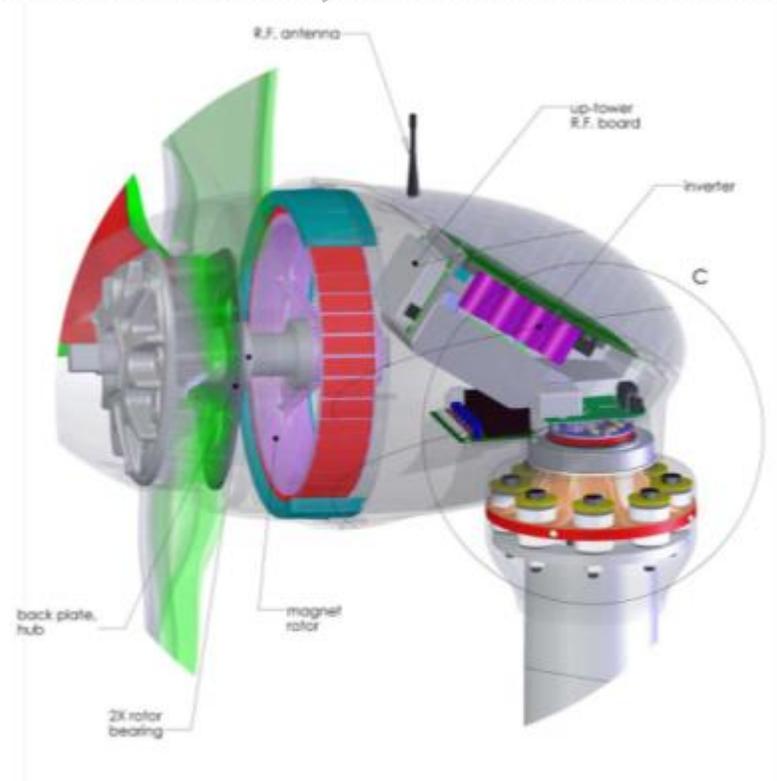
Grid Connected Home



Micro-Grid for Village Electrification

# Today's Technology: Reliable, Safe and Quiet

- Minimal moving Parts
- Produced with Corrosion resistant materials
- Survives winds in excess of 140 mph
- Maintenance is annual inspection from the ground
- Low speed (50-300 rpm)
- Electrical standards require compliance with all the latest IEEE and UL 1741 Safety Standards such as anti-islanding
- Mechanical standards have been created by the IEC. Small wind systems must comply with the new standard



Skystream is the result of a SWWP/DOE partnership

# Concept Overview



## DESIGN OBJECTIVES

- Not be noticed (blends in)
- Pleasing appearance
- Fully Integrated Design
- Operates extremely quietly
- Remote monitored
- Can be integrated into other devices
- Produces energy at a low COE as compared to other R.E. technologies

Skystream was designed to blend into its environment but while at the same time efficiently, quietly producing electricity for a specific application such as a home or business with little or no maintenance.

# Battery Charging Applications



Antarctica (Remote Monitoring)



Remote surveillance

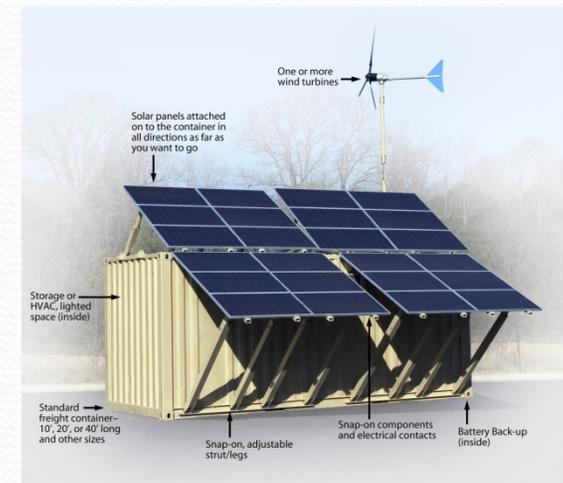


Canada (Telecom)



Texas (Pipeline Protection)

Offshore platforms



Hybrid wind/PV container systems

# Residential Applications



Kennebunkport, ME



New Jersey



Michigan

Small wind systems are used to reduce/eliminate a homes monthly energy bill. These systems typically range from 2-10 KW in size. The installed cost ranges from \$13 – 50K.

# Commercial Applications



**Kotzebue, Alaska – wind/diesel**



**NASA Visitor Centers (Texas)**



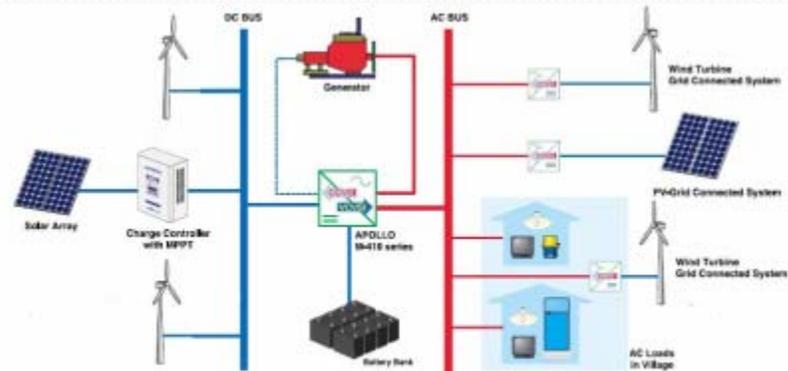
**Maldives Islands – wind/diesel**

# Micro-Grid Applications



**Micro-Grid Systems  
Maldives Islands**

Multiple Skystream's can also be used in micro-grid applications to reduce the consumption of diesel fuel.



Example of a micro-grid system using wind and PV

# Utah Maintenance Yard



Utah Department  
of Transportation  
SHED 4531:  
Milford, Utah

# Trench and Foundation



Trenching and the pouring of the foundation took approximately two days to complete

# Installation and Operation



The tower is a two piece mono-pole design. Installation was completed using the bucket truck to lift and position the turbine into place

# Milford Utah

Description	Cost
Skystream 3.7 Wind Turbine (240 V)	\$4,285.00
Skystream Monopole Tower (45 Ft)	\$2,960.00
Tower Foundation Bolt Kit	\$284.00
Wireless Remote Display Kit	\$232.00
Concrete Foundation	\$1,500.00
Shipping	388.05
Misc Wiring and Conduit	\$400.00
Contract Installation	\$4,000.00
<b>Total Project Cost</b>	<b>14,049.05</b>

Installation time took three days with a two week period in between to allow the foundation to cure

The facility's energy costs have been reduced by 60%. Thus far the customer is very happy with Skystream's performance.

# Conclusion

- The advancement of small wind turbine technology over the last 5-7 years has reduced cost of energy by as much as 60% in many models. Meanwhile, the cost of fossil fuels have more than doubled during the same period. Today renewable energy is a cost effective technology which will:
  - Reduce operating costs
  - Reduce reliance on imported fossil fuels
  - Help curb greenhouse gas emissions



***THANK YOU***  
***Southwest Windpower, Inc.***

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***“Renewable Energy Made Simple”***