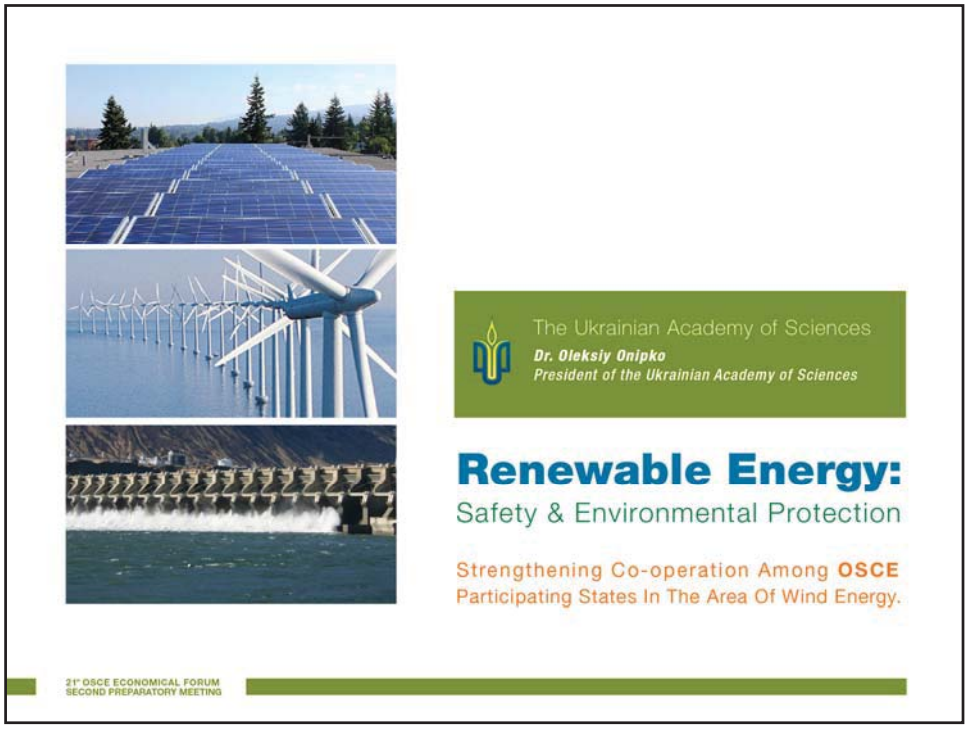
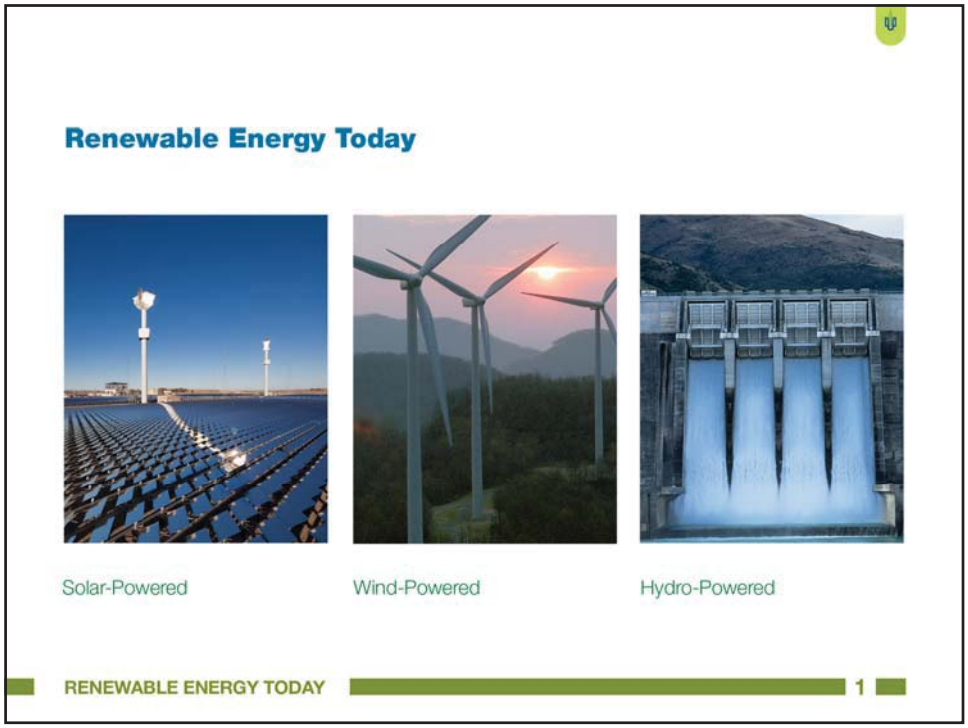
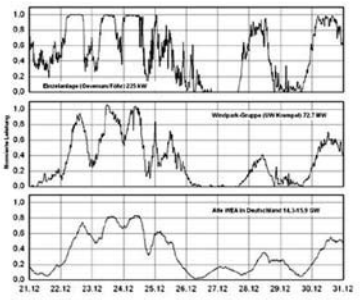
EEF.NGO/14/13
16 April 2013

ENGLISH only







Smoothing Of Wind-energy Oscillation With Increase Of Wind Turbine Quantity

 +  +  = efficient renewable energy

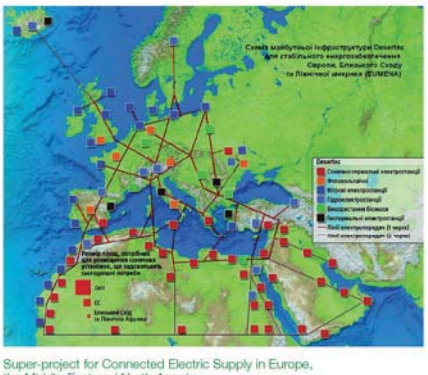
Solar-Powered + Wind-Powered + Hydro-Powered = combined energy sources

RENEWABLE ENERGY TODAY 2

Example Of Small-Scale Combined Energy Sources

290 MW- CAES Anlage Huntorf der E.ON Kraftwerke
erfolgreich in Betrieb seit 1978

290MW Accumulation Energy Station in Germany



Super-project for Connected Electric Supply in Europe,
the Middle-East and North America

RENEWABLE ENERGY TODAY 3

Wind Energy

Types of Wind Energy:

Small Wind

Large Wind

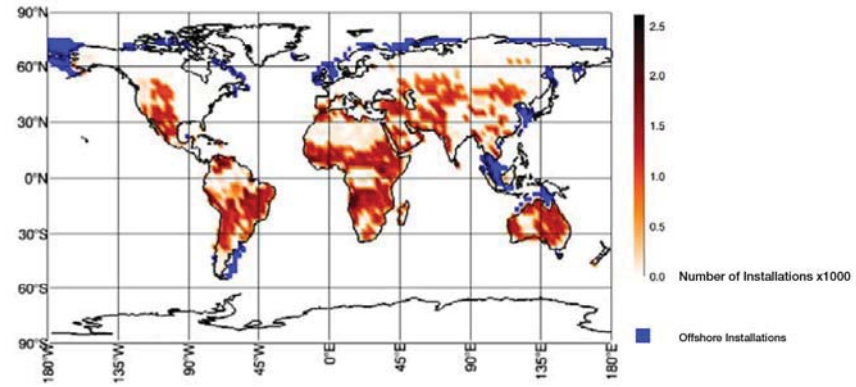
Dangers of Using Large Wind Energy

Wind Shadows Behind Large Wind Turbines

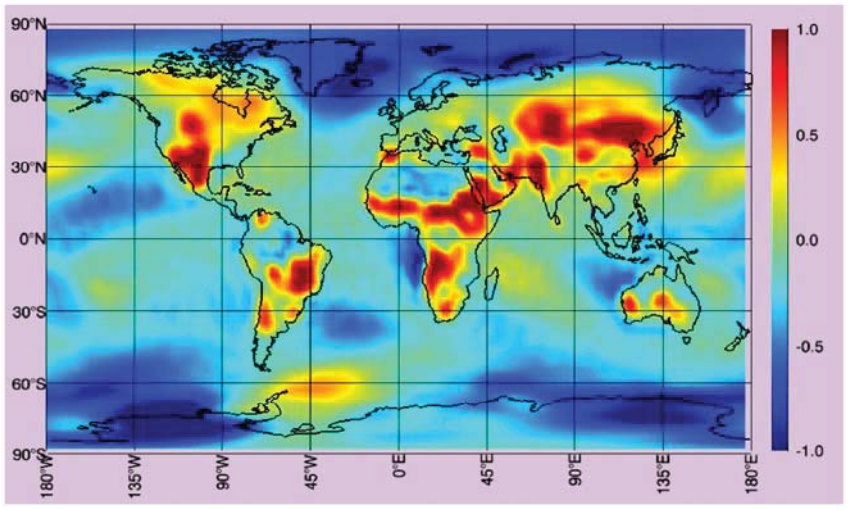
- *Severe effect on climate*
- *Dangerous for birds*
- *Visual Polution*

Simulation Conducted by *U.S. National Center for Atmospheric Research*

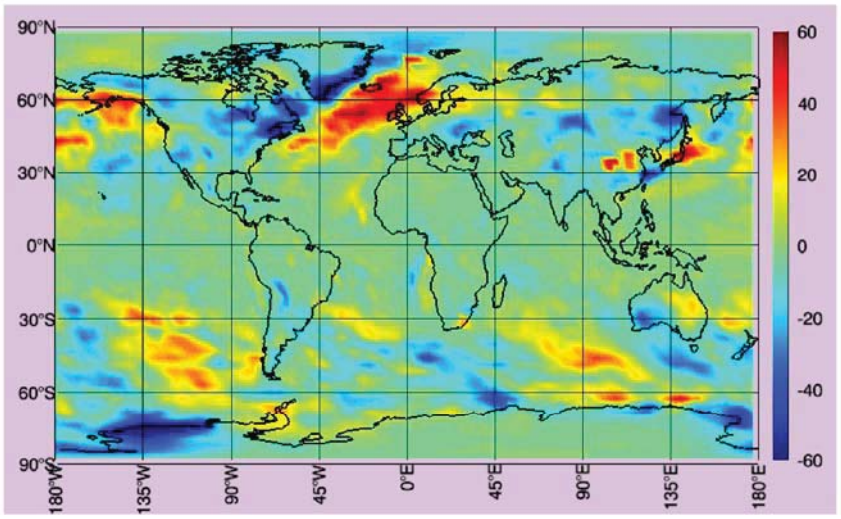
Simulation ran for 60 years, means of the last 20 years (years 41-60) of each of the model integrations are used in the analyses.



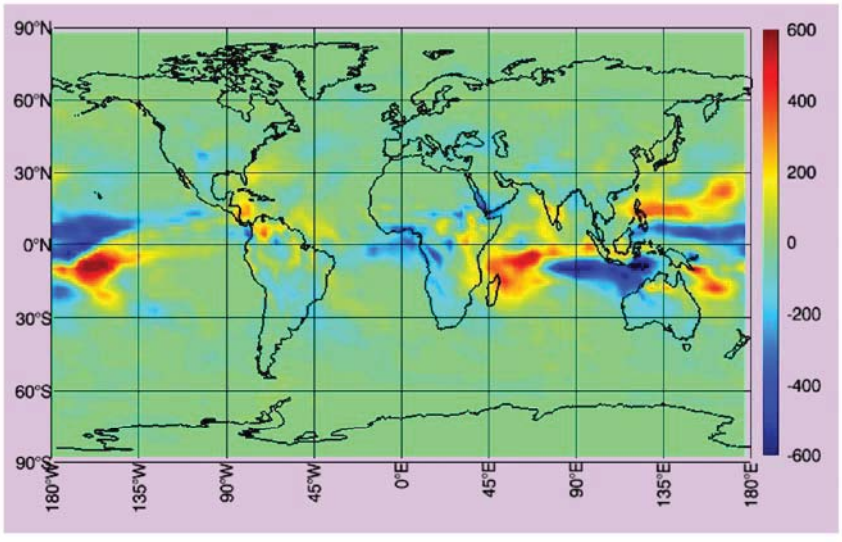
Locations of Land & Offshore Windmill Installations in Simulation



Temperature Variation in (°C)



Change Of Largescale Precipitation (mm/yr)



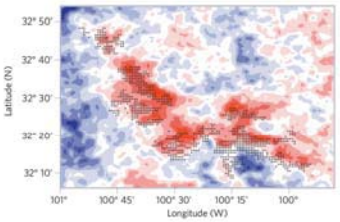
Change Of Convective Precipitation (mm/yr)

Analyses Of Satellite Data For The Period Of 2003–2011 Over A Region In West-central Texas, Where Four Of The World's Largest Wind Farms Are Located

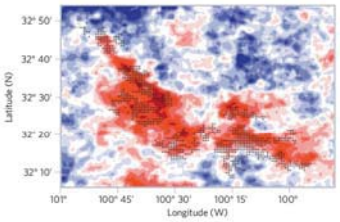
Location of One or More Wind Turbines

Temperature Variation in (°C)

−1.1 −0.7 −0.3 0.1 0.5 0.9



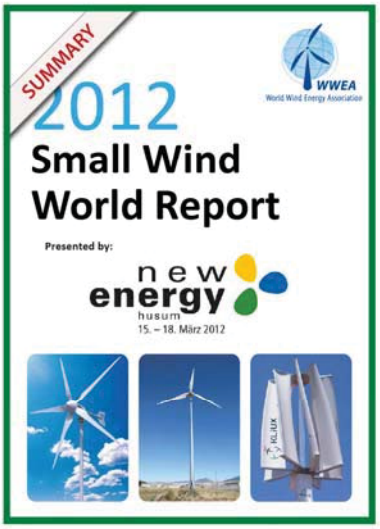
Temperature Difference between (2011-2009) and (2005-2003)



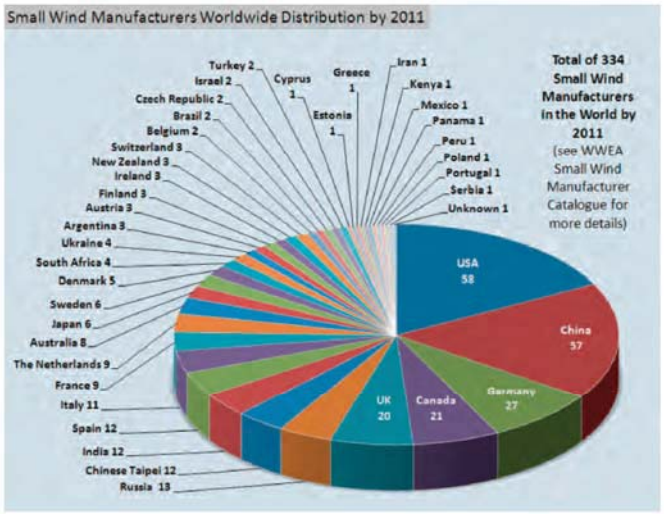
Temperature Difference between (2010) and (2003)

Need for Small Wind Energy

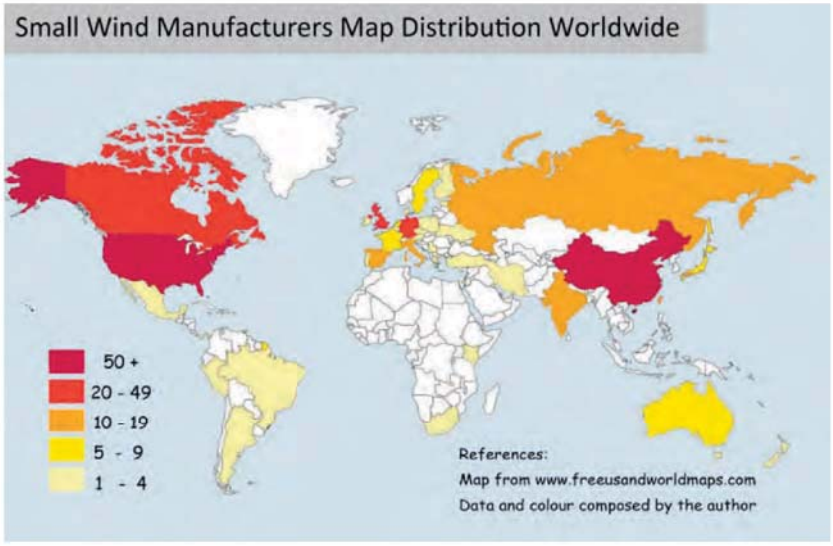
Different Small Wind Turbines



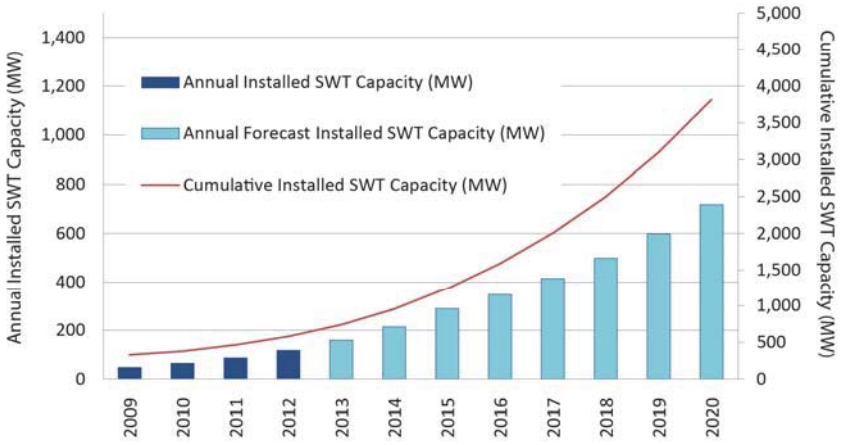
Data from the Small Wind World Report 2012



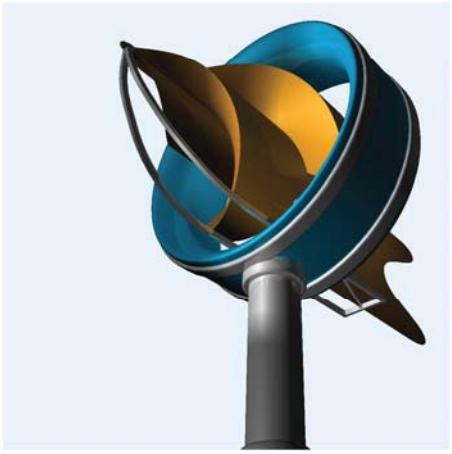
Small Wind Manufacturers Map Distribution Worldwide

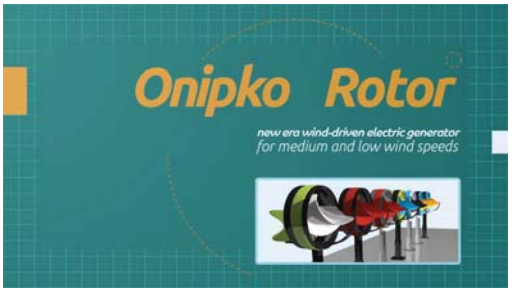


Small Wind Turbines Installed Capacity World Market Forecast 2020



New Era Small Wind Turbine: Onipko Rotor





CHARACTERISTICS:

- Electricity from areas with low wind speed
- Starts energy production from 0.1m/sec speed
- Very high efficiency in utilizing wind power
- Works with abrupt wind variation
- Low noise leve
- Ornithological safety (safe for birds)
- Ergonomic design

Suggestions On Strengthening Co-operation Among OSCE Participating States In The Area Of Wind Energy:

-Further support and strengthening of OSCE's role as a medium for sharing technology to reduce the adverse environmental impact of energy, such as progressing small wind technology in favor of large wind technology, etc…

-Development and implementation of pilot projects in the small wind energy sector.

-Creation of an international network between academia, the business sector, and society for the sustainable development of the global energy sector, in order to elaborate new golden rules of wind energy.

-Provide efforts for the creation of a future Connected Electric Supply System in the OSCE area.

Renewable Energy:

Safety & Environmental Protection

Strengthening Co-operation Among **OSCE** Participating States In The Area Of Wind Energy.

Thank You!

Contacts:
Ukrainian Academy of Sciences
03142, Kyiv Semashko 13 strt.
tel: + 380 44-424-51-81 / + 380 50-419-77-99
email: ONI1@i.ua
Dr. Oleksiy Onipko