



WIND ENERGY IN MEXICO  
Private Sector Participation

NOVIEMBRE 2005

## Founding Members

- Fuerza Eólica-Clipper
- EDF Energies Nouvelles
- Iberdrola
- Endesa
- General Electric
- Preneal
- Expansión Exterior
- Aeolus
- Eoliatec
- Soluciones en Energías Renovables
- Vestas
- Cableados Industriales
- Gamesa Eólica

## Worldwide Experience

<b>Members</b>	<b>Installed Capacity</b>
• Fuerza Eólica/Clipper	900 MW
• EDF Energies Nouvelles	790 MW
• Iberdrola	3,100 MW
• Endesa	1,100 MW
• Preneal	328 MW
• Gamesa	1,222 MW
• Unión Fenosa	450 MW
• VESTAS	Manufacture
• GE	Manufacture

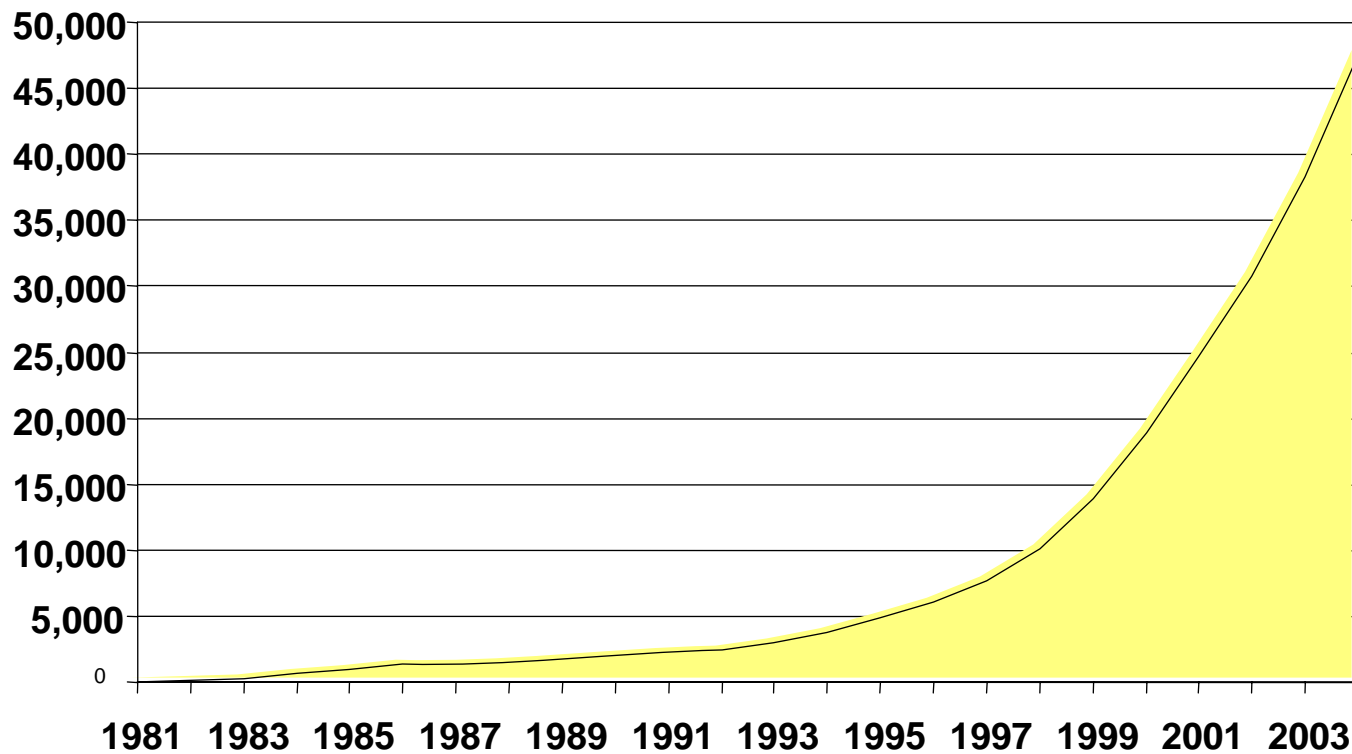
Country	Installed Capacity Total end of 2004 (MW)	Installed capacity in 2004 (MW)	Growth rate (2004)
Germany	16628.8	2019.7	13.8%
Spain	8263	2061	33.2%
US	6740	370	5.8%
Denmark	3117	7	0.2%
India	2985	875	41.5%
Italy	1125	221	24.4%
Holland	1078	170	18.7%
Japan	896.2	390	77.1%
UK	888	240	37.0%
China	764	197	34.7%
Mexico	5	0	0.0%
Rest of the world	5131.4	1770.1	63.2%

**TOTAL: 47,621.4 MW INSTALLED**

**\* SOURCE: WWEA 2004**

# Wind Energy Evolution

MW Installed



## Benefits for Mexico

- Increase in energy portfolio diversity
- In line with the Treaty of Kyoto:
  - Clean Energy not dependable on Fossil Fuels.
  - Reduction on Natural Gas Imports.
  - Credibility.
- Long term security in the cost of energy by not depending on fossil fuels or exchange rates.
- Each kWh generated implies a reduction of Natural Gas (imported), carbon or diesel consumption. It also increases the level of water at the Hydroelectric plants for an efficient use at peak hours.
- Quality of life improved for Mexicans.

# Opportunities

- **The wind resource in Oaxaca is recognized to be one of the best in the world.**
- **Local and international financial institutions have expressed interest**
- **The Wind Projects will activate the local economy**
- **Job creation during the construction and operation of the Wind Farms.**
- **Creation of a national industry associated with Wind Energy**

**In Mexico, 3,800 MW could be developed in a short and medium term (2006-2014)**

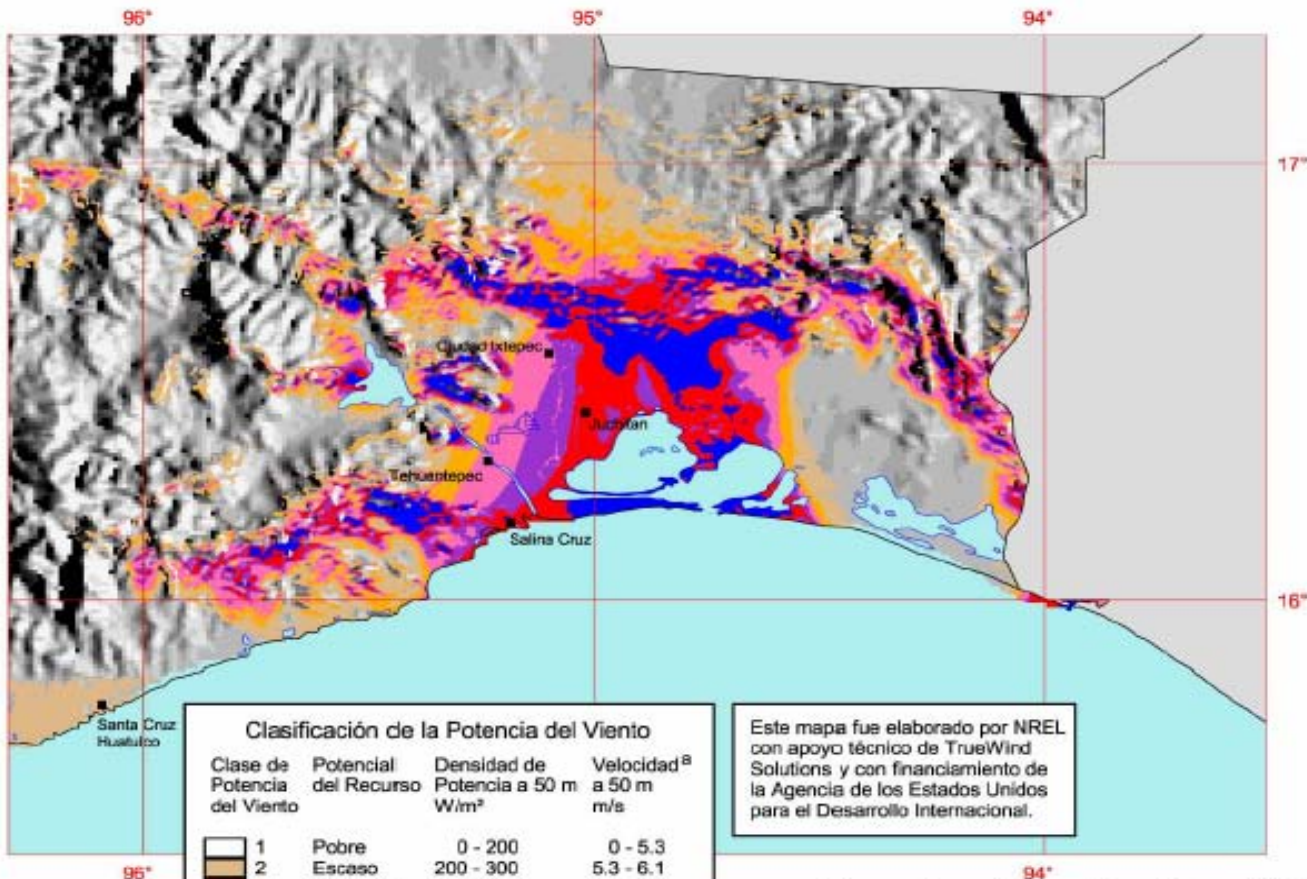
## Plans for México 2006 - 2014

Company	Capacity	Investment (USD)
• Fuerza Eólica/Clipper	150 MW	\$ 200
• EDF EN	350 MW	\$ 450
• Eoliatec	300 MW	\$ 375
• Iberdrola	250 MW	\$ 320
• Endesa	400 MW	\$ 500
• Preneal	800 MW	\$ 1,000
• Soluciones en Energía Renovable	250 MW	\$ 320
• Gamesa	300 MW	\$ 375
• Unión Fenosa	300 MW	\$ 375
• CFE	600 MW	\$ 750

**TOTAL : 3,800 MW y 4,650 MUSD**



## Región del Istmo de Oaxaca - Mapa de Recursos Eólicos



**Leyenda**

■ Poblado o ■ Capital

20 0 20 40 60 80 Kilómetros



Agencia de los Estados Unidos para el Desarrollo Internacional



Departamento de Energía de Estados Unidos  
Laboratorio Nacional de Energía Renovable



# Alternatives

- **Independent Power Producer.** **600 MW**
- **Self – Supply .** **3,200 MW**
- **Total** **3,800 MW**

# Independent Private Producer

- With a Public Bid, The CFE (Federal Commission of Electricity), will require O & M of a Wind Farm and commit to buy the energy with a long term contract.
- The Public Bid winner will need to finance the complete project.
- **An energy price subsidy is required** due to the actual rules of the CFE in the IPP scheme..

# Self-Supply

- Scheme contemplated in the Law of Public Electricity Service (LSPEE).
- The self-supply society generates the electricity exclusively for its partners.
- **A subsidy is not required in the actual tariff scheme**

**It's an alternative permitted by the law and economically sound**

# Self-Supply

- The electricity generated is delivered at the interconnection point to the CFE and it's carried to the consumer centers (there is no need of physical changes in the consumer's infrastructure)
- The consumers still hold their normal contract with the CFE as a backup for the renewable energy, making sure the consumers of renewable energy always have supply.

# Benefits

- Energy price is below official tariffs – important cost reductions for the Offtakers; improving competitiveness.
- Security in the long term tariff. Price is not subjected to fossil fuel price or exchange rates.

The Offtaker does not provide financing

# Decisive Action

- Congress:
- Creation and Publication of a Renewable Energy Promotion Law.
  - Compromise – A Development Plan.
  - Incentives for Investment.
  - Clear rules for operation and delivery of energy.
  - National Integration
- Energy Regulatory Commission:
- Publication of a Interconnection Contract for Renewable Energy.
  - Capacity recognition.
  - Energy Bank mechanisms
- Secretary of Energy:
- Transmission.
  - Authorities compromise for a planning of the necessary transmission capacity.



# Conclusions

- Mexico is well positioned to take advantage of the emissions market and develop an important contribution to the problem of global warming.
- The renewable energy sources could account, in the best of cases, for 5% of the total generated electricity in 10 years
- Correct and opportune planning is necessary for the phased growth of transmission infrastructure, in such a way that allows the interconnection of CFE wind energy projects as well as self-supply projects in the short term (2006-2007), using the current installed capacity; in the medium term (2008-2010) in a second phase by repowering the existing lines; and in the long term (2011-2015), in a third phase, by the construction of new transmission lines, with the goal of having a total capacity of up to 3800 MW in the Isthmus of Tehuantepec within 10 years.

On behalf of all of AMDEE, thank you for  
your time and attention.

