



## **Wind Farms: Unique Risks and Carbon Trading**

Ana Paula Ares

Senior Director

La Jolla, California – May, 2010



## Favorable Momentum For The Wind Power Sector

- > Sharp increase in energy needs throughout the world
- > Rising energy prices
- > Insecurity of natural gas and hydro capacity supply
- > Growing environmental awareness



## Wind Farms: Key Drivers for a Green Growth

- > Proven technology
- > Abundant regional resources: underutilized, energy supply security
- > Speed of deployment
- > Increased number of countries with specific wind power targets
- > Government support through state based incentives



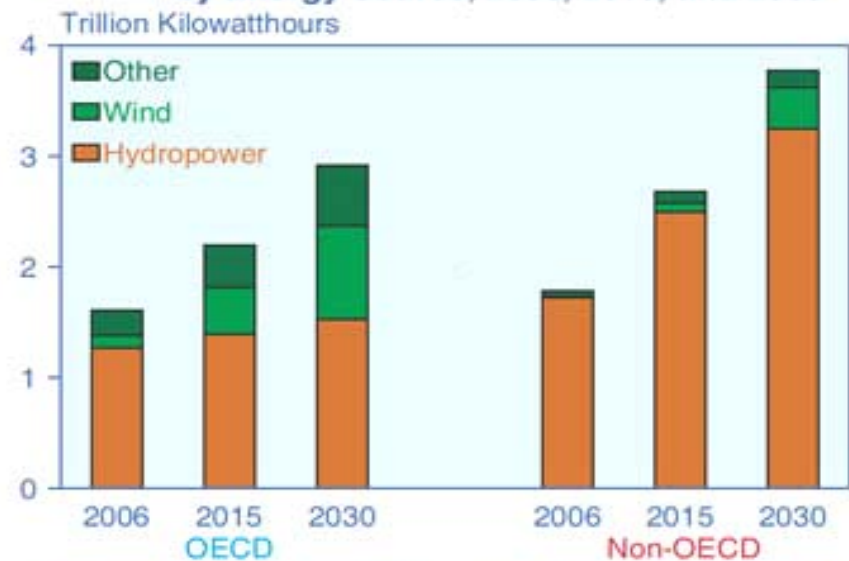
## Some Renewables' Statistics

**Figure 6. World Electricity Generation by Fuel, 2006-2030**



Sources: **2006:** Energy Information Administration (EIA), *International Energy Annual 2006* (June-December 2008), web site [www.eia.doe.gov/iea](http://www.eia.doe.gov/iea). **Projections:** EIA, *World Energy Projections Plus* (2009).

**Figure 7. World Renewable Electricity Generation by Energy Source, 2006, 2015, and 2030**

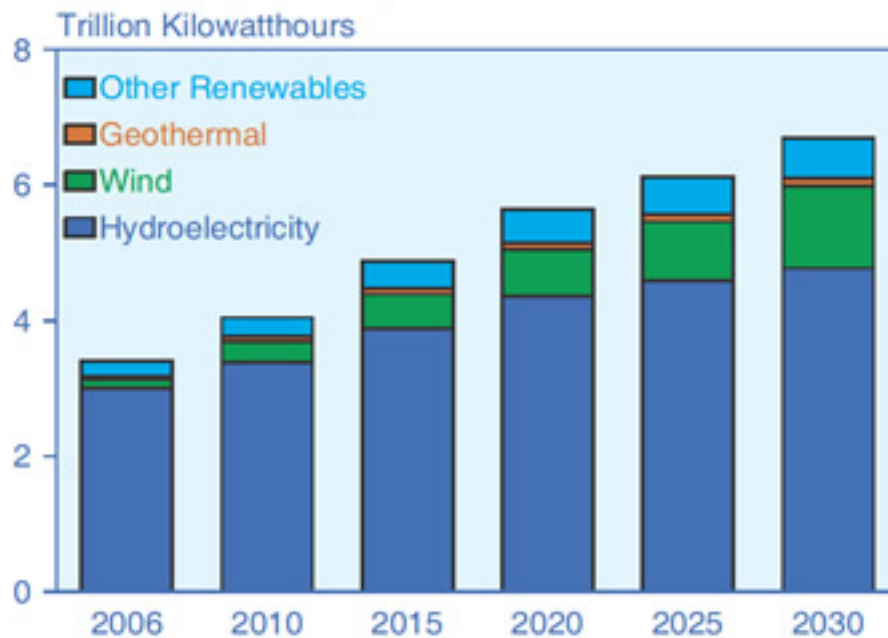


Sources: **2006:** Energy Information Administration (EIA), *International Energy Annual 2006* (June-December 2008), web site [www.eia.doe.gov/iea](http://www.eia.doe.gov/iea). **Projections:** EIA, *World Energy Projections Plus* (2009).



## Projected Wind Power Growth

**Figure 17. World Renewable Electricity Generation by Source, 2006-2030**



Sources: 2006: Energy Information Administration (EIA), *International Energy Annual 2006* (June-December 2008), web site [www.eia.doe.gov/iea](http://www.eia.doe.gov/iea). Projections: EIA, *World Energy Projections Plus* (2009).



## Wind Farms: Unique Risks

	Wind Projects	Thermal Projects
<b>Pre-investments costs</b>	Significant	Limited
<b>Project Scale</b>	Small	Medium-Large
<b>Power Outage</b>	Intermittent/requires back up	Constant
<b>Economic Incentives</b>	Imperative	Self-Sustained
<b>Regional Financial Track Record</b>	Scarce	Ample



## Fitch's Credit Analysis

- > Risk factors that may impact the economics of a project :
  - economic and legal framework in which the project operates
  - exposure to price risk
  - completion risk (for projects under construction)
  - expected power output (independent engineer)
  
- > Financing structure



## Risk Factors

### > Regulatory Risk

- Key issue: sustainable regulatory framework
- Country's level of commitment towards renewables
- Wind turbines still cannot compete on price alone with thermal power plants
- Public incentives are essential:
  - > Feed-in tariffs
  - > Green certificates
  - > Tender process
  - > Tax incentives



## Risk Factors

### > Construction Risk

- Straightforward and fast construction process
- Onshore wind farms lower construction risk than for thermal power plants.

Key factors:

- Turbine manufacturers
- Potential bottlenecks in the turbines' supply chain
- Supply agreements in place
  - > reduce risks of material cost overruns
- Timeframe to obtain all of the necessary planning and construction permits

### > Energy Production Risk

- Energy Production assessment methods=> uncertainty
- Fitch's Base case: P50 estimate a typical haircut applied assessment (10%)
- Fitch focuses on how the cash flows are affected by single year events



## Risk Factors

### > Price Risk

- Fixed - price, long-term off - take versus pure market risk
  - > As the risk increases, the level of DSCR necessary to achieve an investment - grade rating will also rise
- Exposure to price risk can take the form of exposure to the wholesale power price or to that of Green Certificates
  - > Mitigant: off take contracts with third parties; Fitch assesses counterparty risks
- Most investor - friendly incentive systems give wind farms priority of dispatch together with long - term fixed prices

### > Operational Risk

- Technology used
- Experience of the operator
- O&M: sufficient to maintain turbines performance



## Financing structure

### > Quantitative factors analysis:

- Fitch's 'Base Case':
  - > likely to occur
  - > transaction's long-term average performance
- Fitch's 'Rating Case':
  - > expected performance under a scenario incorporating a harsh but feasible combination of stresses
- Onshore wind farm debt: Minimum DSCR of 1.30x under the Fitch Rating case to be in-line with an investment grade rating

### > Structural features that might reduce volatility:

- Debt service and maintenance reserves, cash trap mechanisms, hedging of interest rate and inflations risk



## Qualitative Characteristics of a Typical Onshore Wind Farm Project that are Consistent with Investment-Grade Ratings

Construction risk	Fixed-price Engineering Procurement and Construction contract with experienced contractor; adequate completion guarantees and liquidated damages provisions; permits granted.
Operational risk	Technology with track record of proven and reliable performance; experienced operator; appropriately structured insurance (including business interruption insurance).
Price risk	Limited exposure to market risks; investment-grade off-taker.
Project size	Minimum capacity of 100MW and diversified by number of turbines (more than 70).
Structural features	Fully amortising debt over the asset's economic life or limited and mitigated refinancing risk; minimum of six months of debt service reserve; sufficiently tight cash-sweep or equity lock-up triggers; major maintenance or operational reserve.

Source: Fitch



## Carbon Trading

- > Carbon Markets = Valuable tool for limiting CO2 and other gas emissions
- > LA well positioned to participate in the global carbon market:
  - Natural resources
  - Geographic endowment
  - Regional leaders: Brazil, Chile
- > External Policy Factors will determine:
  - The form the LA carbon markets takes
  - The rules through which these markets operate
  - The level of investment these markets attract



## Carbon Credits: Fitch's rating approach

- > Carbon Credits: Case by case analysis
  - Carbon credits sales contract
    - > Analyze off-taker credit quality
    - > Fixed price contract versus market price contract
      - apply some type of price discount in the analysis
  - Carbon credits market sales
    - > Carbon prices have a history of volatility
    - > Uncertainty about long term prospects
    - > Apply harsh assumption to future carbon prices



## Concluding Remarks

- > Fitch has a track record in analyzing wind farm projects
- > Generally, such ratings have been private, used for banks participating in the financing of the projects
- > Wind farm transactions are rated on the back of power revenues
- > Carbon credits can provide a potential upside to the project



**Fitch Ratings**

*www.fitchratings.com*

**New York**

One State Street Plaza  
New York, NY 10004  
+1 212 908 0500  
+1 800 75 FITCH

**London**

101 Finsbury Pavement  
London  
EC2A 1RS  
44 20 7417 4222

**Singapore**

7 Temasek Blvd.  
Singapore 038987  
+65 6336 6801