



# Wind Power and the Market REWP, Paris 24 March 2015



GWEC - Uniting the global wind industry and its representative associations



#### **Outline:**

- 1. Introduction
- 2. Brazil
- 3. Mexico
- 4. South Africa
- 5. Turkey
- 6. US
- 7. Future Market Design





#### How much does wind power cost?

- Very site specific:
  - Wind resource location
  - Competition among suppliers machines available
  - Cost/availability of Finance
  - Regulatory Regime
  - Planning process
  - Flexibility/size of grid
- Range of what utilities/offtakers pay at present:
  - <\$0.02/kwh (Great Plains, US) \$0.24/kwh (Japan)
  - IRENA 2014 costing study has 'average' at \$0.06-0.07/kwh (presumably will have gone down in the last 2 months due to rise in value of the dollar)



# BRAZIL

- Cheapest source of new generation capacity avg price last auction <\$0.05/kwh on 20 yr ppa ; roughly 1/3 cheaper than thermal;</li>
- Support available through less-than-market price finance (BNDES), but same available to all others as well – but at a 'price' due to FINAME rules;
- First few self-supply contracts Honda factory
- 'Free market' not very well developed





#### MEXICO

- To date, all wind through self-supply contracts;
- Heavily regulated vertically-integrated system impossible to determine 'price' for anything;
- Energy Reform moving towards more liberalised system;
- Aggressive targets of 9500 MW by 2018, and 12,000+ by 2020;
- Auctioning will begin late 2015/early 2016 (maybe) we'll have first real indications of 'real' prices at that time.





# **SOUTH AFRICA**

- Just getting underway, but cheapest on the market. Now going for about <\$ 0.055/kwh. New coal is ~ \$ 0.09/kwh;</li>
- 20 year ppa with strong local content requirements, price may go up as these kick in more, current pipeline of about 4 (8) GW;
- Selling price of electricity is generally below generation cost
- Main utility (ESKOM) in dire financial straits.

	TOTAL INSTALLED CAPACITY													
600													,	
500														
400													/	
300														
200														
100														
0	_													
year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
MW	3.16	3.16	3.16	3.16	3.16	3.16	8.36	8.36	10.16	10.16	10.16	10.16	570	
	Source: GWEC													



# TURKEY

- Most wind to date has been sold on the spot market; FIT (2005) deemed too low (\$ 0.073/kw);
- However, this is changing due to the availability of 'local content' which can rise the price up to \$ 0.037/kwh (i.e., max \$ 0.10/kwh);
- High wholesale prices and liquid market (and increasing demand) have made this a good market for wind (along with the good wind resources, of course.





# **UNITED STATES**

- Average PPA prices in 2013 across the country were \$0.025/kwh, exclusive of PTC, ITC, etc., so 'costs' were \$0.04 \$0.048;
- At the lower end of the national average wholesale price; competive with new-build gas;
- Lowest PPAs were \$ 0.016/kwh;
- Increasing # of direct supply contracts, but still small %'
- Wide regional variability;





#### Missing from all of these

- Cost of CO2
- Cost of water
- Costs of integration
- Costs of (lack of) SOX,NOX etc.
- Effect on balance of payments/foreign exchange
- Effect on employment and local economic development
- Effect of price stability
- Costs of fossil fuel subsidies
- Costs of nuclear insurance and decommissioning costs



#### New Market Design: what we need

- A price on carbon and some of the other externalities which the competition currently gets for free would be good;
- PPAs, preferably 20 yrs, to get affordable finance;
- A way to reward flexible generation: to make the system work, to avoid curtailment caused by inflexible generation, etc.;
- Ways to sell electricity for transport and heat as well as power.





# Thank you!

For more information:

Steve Sawyer, GWEC

<u>Steve.Sawyer@gwec.net</u>

