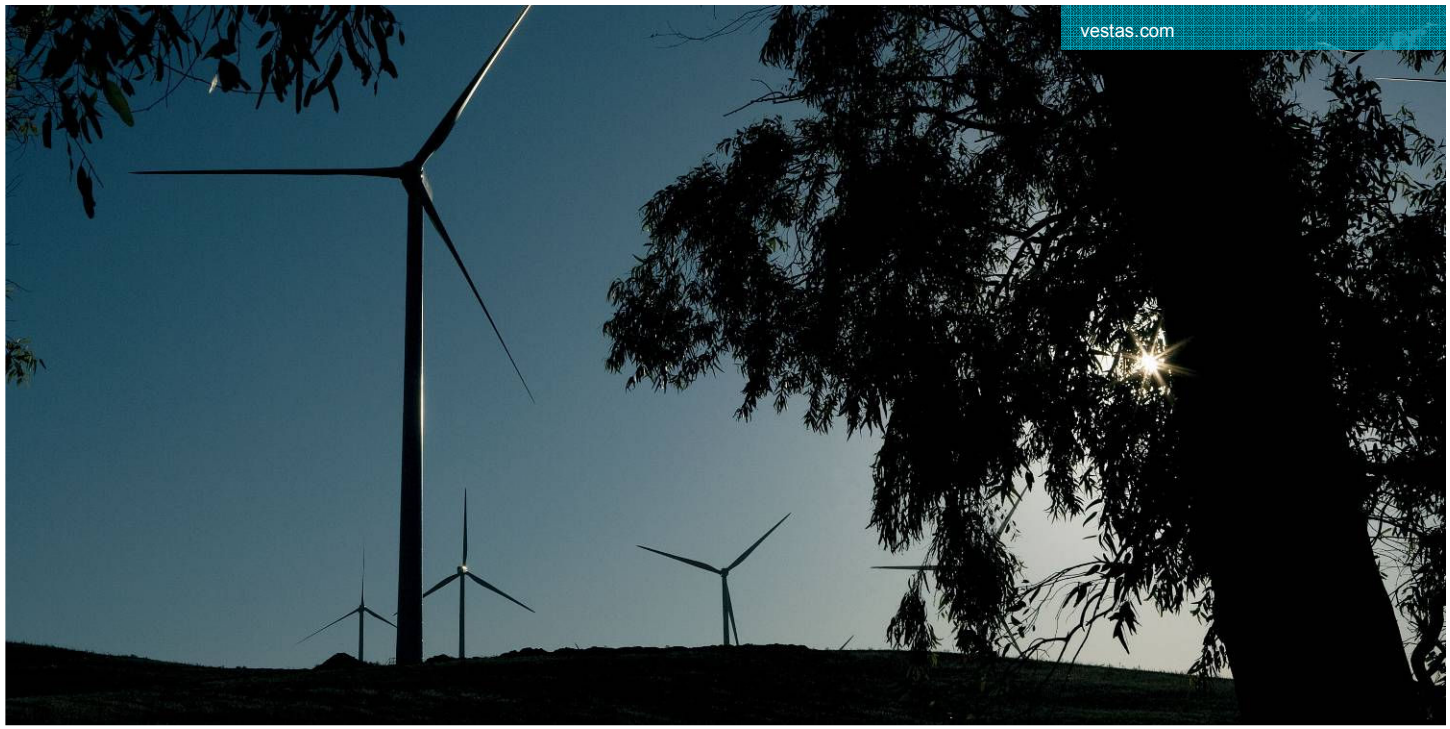
No. 1 in Modern Energy

How to create an attractive wind market

OSCE Conference on Renewable Energy
Baku, 13.10.2009
Karl Heinz Fatrdla



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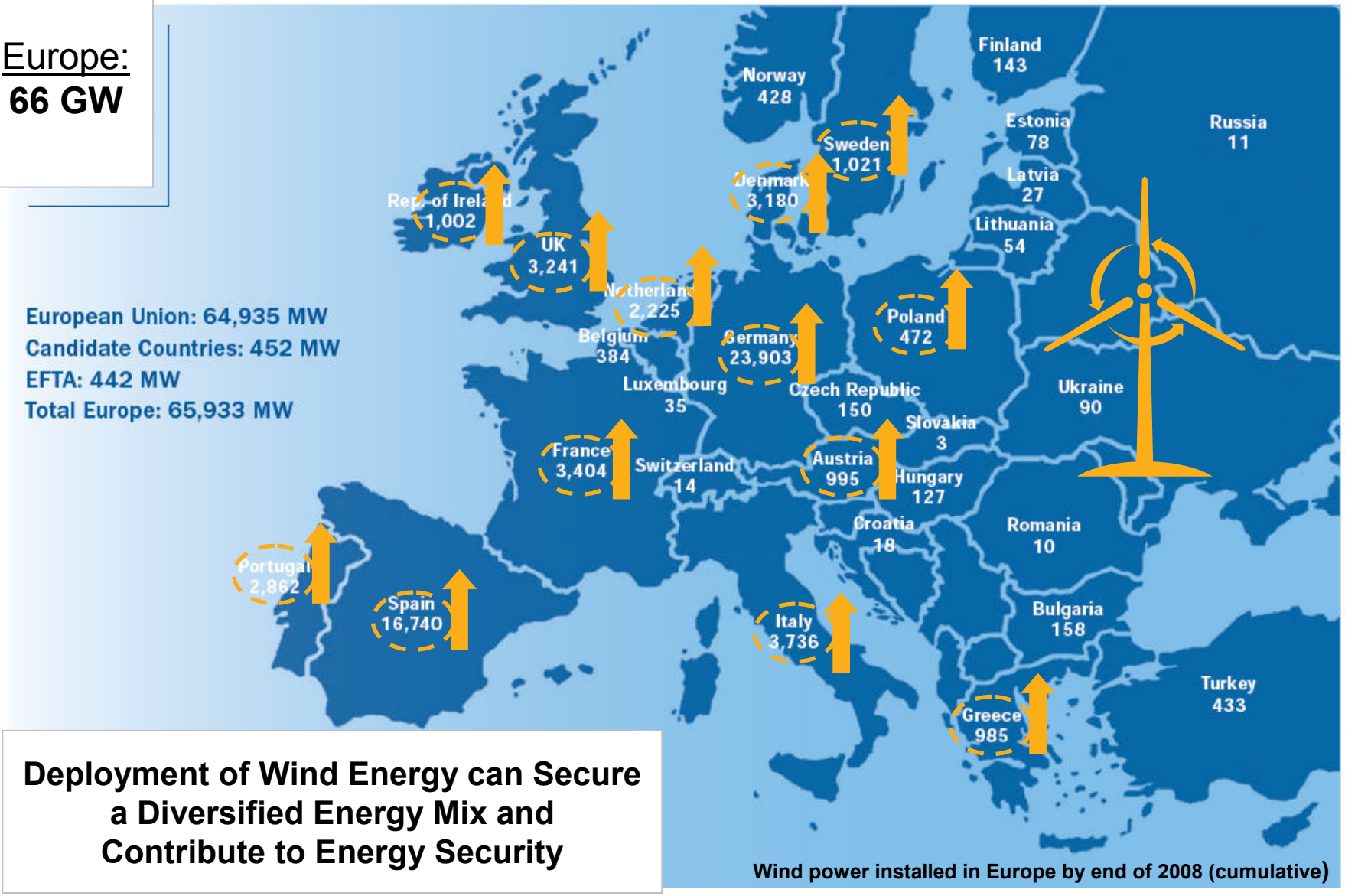
European Countries Recognize the Virtues of Wind Energy

Europe:
66 GW



Deployment of Wind Energy can Secure a Diversified Energy Mix and Contribute to Energy Security

Wind power installed in Europe by end of 2008 (cumulative)

Sources: EWEA 2009

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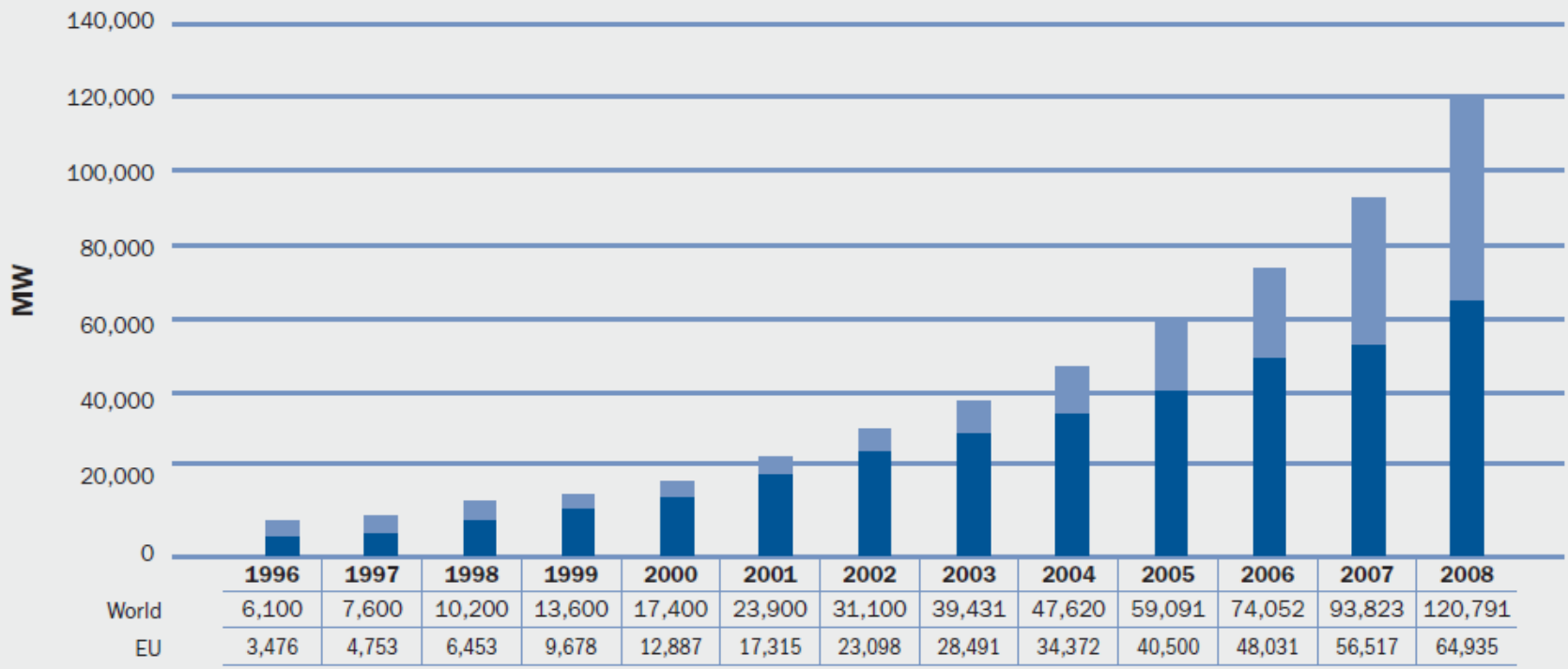
Global and European Track Record

> 120 GW in 2008

Global cumulative wind power capacity 1996-2008 (in MW)



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
World	6,100	7,600	10,200	13,600	17,400	23,900	31,100	39,431	47,620	59,091	74,052	93,823	120,791
EU	3,476	4,753	6,453	9,678	12,887	17,315	23,098	28,491	34,372	40,500	48,031	56,517	64,935

Source: GWEC/EWEA

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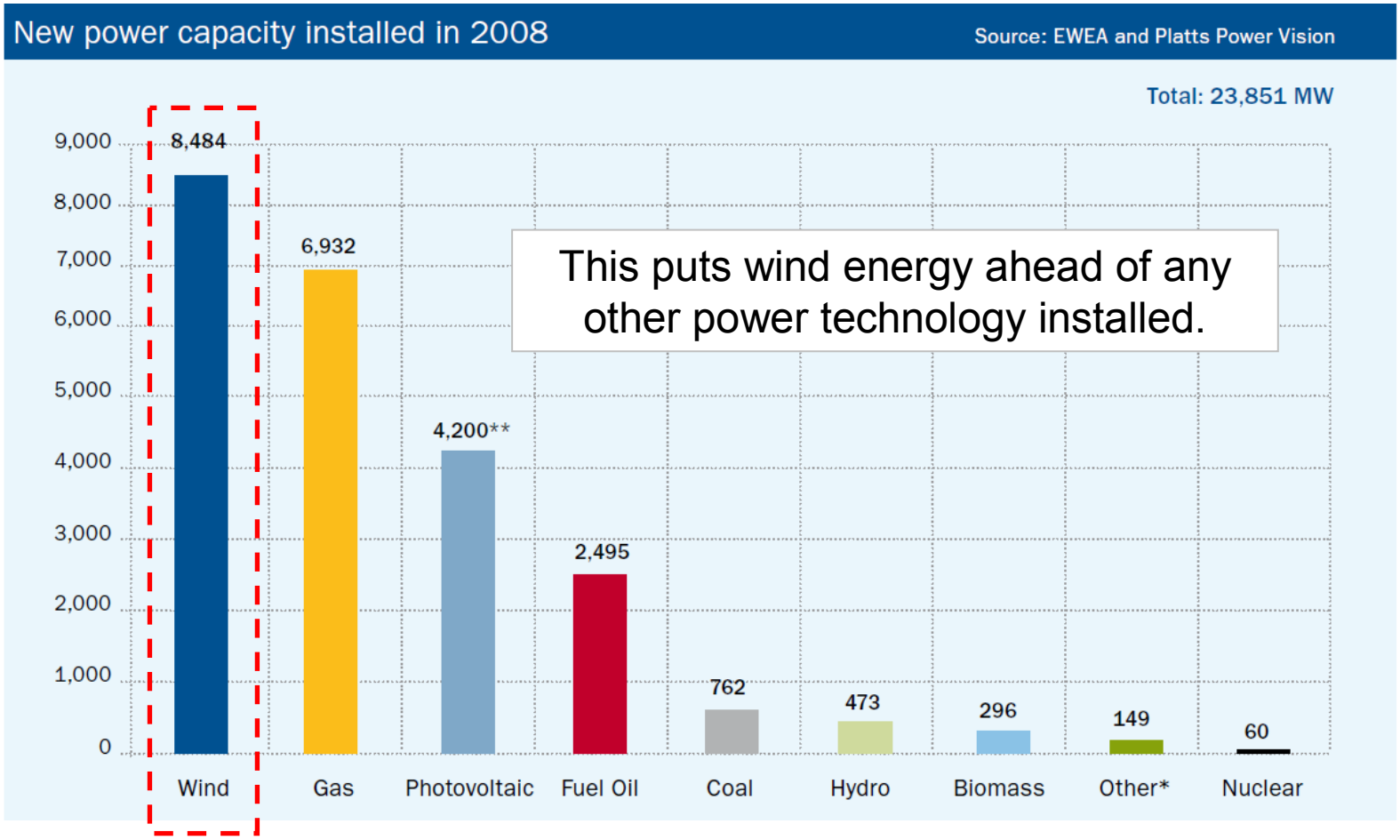
8,484 MW wind power was installed in the EU in 2008



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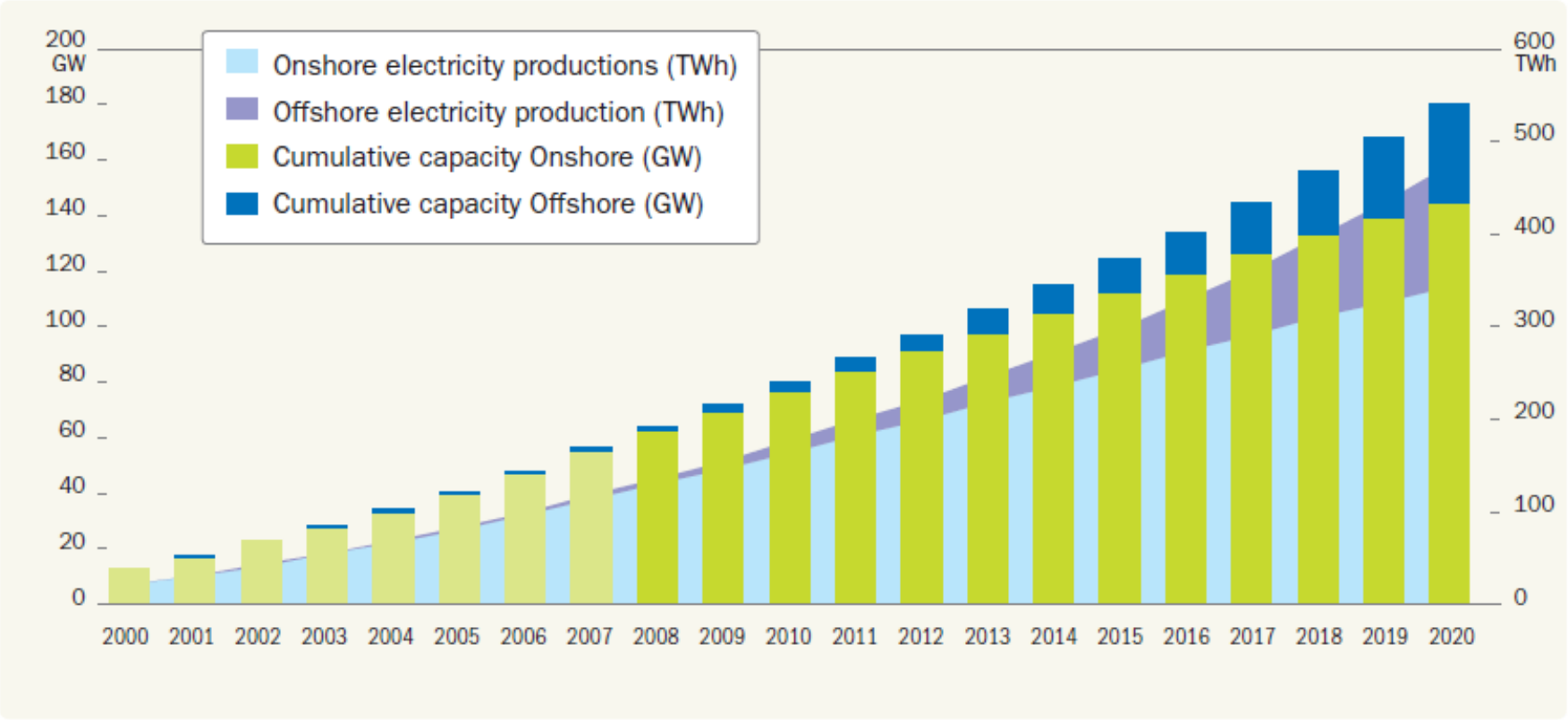
Projected European Electricity from Wind Power to 2020

> 180 GW in 2020



Sources: EWEA 2008

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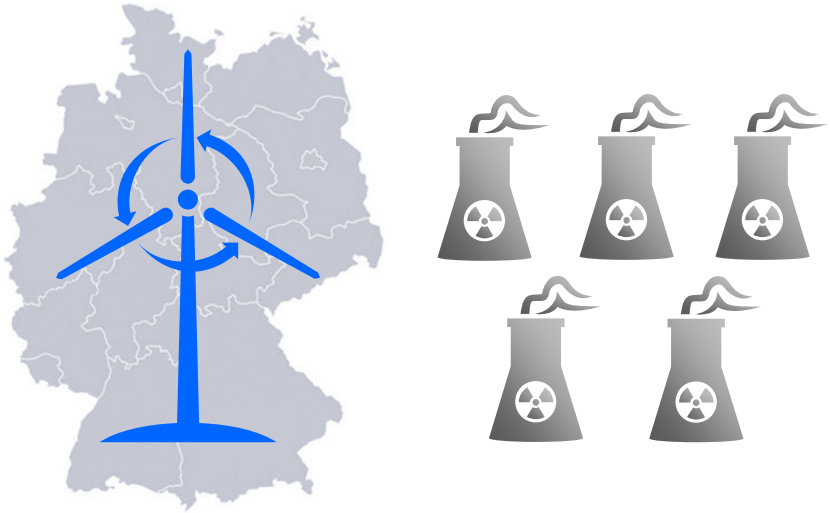
Wind Farms Today are Real Power Plants. An Example.

In 2007, the German electricity generation from renewable sources increased 30% to 66.7 TWh

Wind energy accounts for 40,5 TWh

This is…

Equivalent to the annual output of five nuclear power plants



Sources: Die Welt, September 10, 2009, p.3, Deutsche Bundesnetzagentur 2009, Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (BMU), Erneuerbare Energien in Zahlen 2009

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What has created an attractive wind market?

- **Business case certainty** is a basic requirement for securing investments and larger deployment of wind energy.

- **Stable framework of conditions** need to be put in place.

- Government attention has to be given to **pro-active planning and policies**.

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Regulatory Best Practice Essentials

- **Support System:**
  - A feed-in tariff requiring utilities to buy all power produced from wind power.

- **Open and guaranteed access to the grid:**
  - Transmission System Operators (TSOs) are required to finance, construct, interconnect, and operate the transformer stations and transmission and distribution infrastructure for wind power.

- **Fair and streamlined permitting procedures:**
  - I.e.: approval of pre-investigation of sites, environmental impact assessments, construction and operation, and licenses to produce electricity.

- **Ensuring sufficient new transmission capacity:**
  - Ensure dynamic support to the grid. Building the necessary transmission lines, for example, takes time and must be started early on in order to assist in implementing large scale wind power.

- **Wind has to be a key part of energy policy planning:**
  - Long term political support is a must (stability) – clear targets and timetables are needed.

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Best practices for different support schemes

- **The feed-in tariffs:**
  - guaranteed long term
  - technology specific
  - at high enough level
  - decrease over time

- **The quota and certificate market system:**
  - minimum number of independent market players
  - penalty for non-compliance significantly higher than production costs
  - minimum tariff to reduce investor risk

- **The tender system:**
  - continuous and predictable calls for tenders
  - technology specific and with an appropriate capacity

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Utilizing Azerbaijan's wind potential brings local benefits

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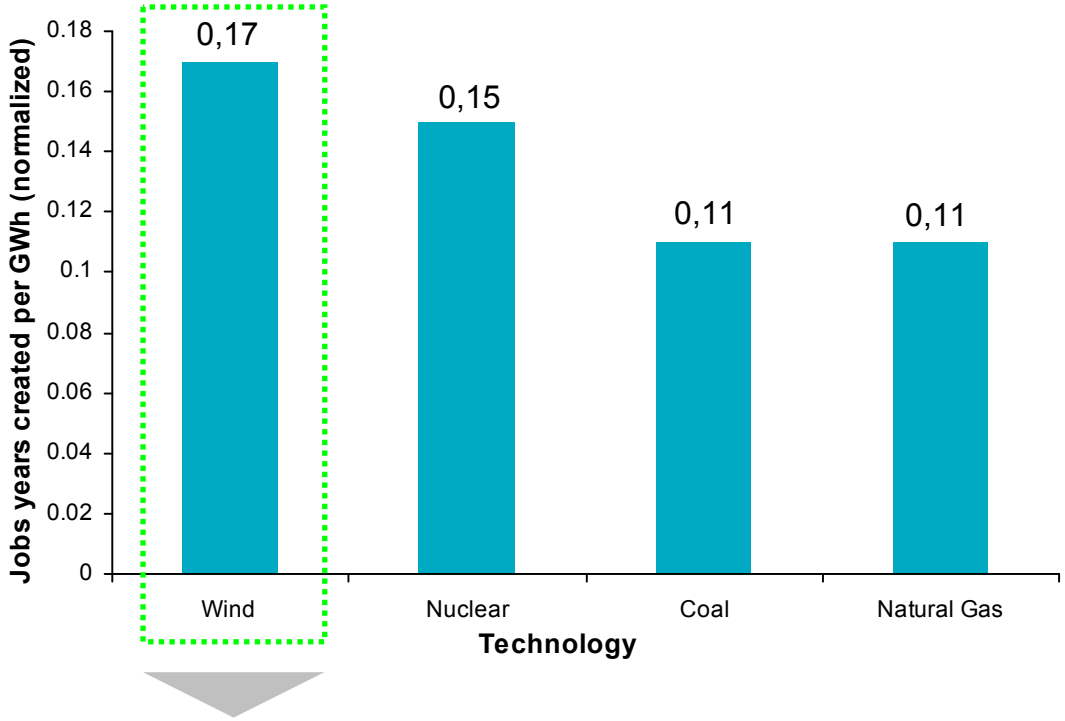
Wind Energy Creates Many New Jobs per GWh

Average employment for wind and non-renewable energy technologies, normalized to the amount of energy produced



Being more labour- and less fuel-intensive, one GWh of wind power production leads to higher employment than conventional forms of energy

Sources: Kammen/Engel 2009

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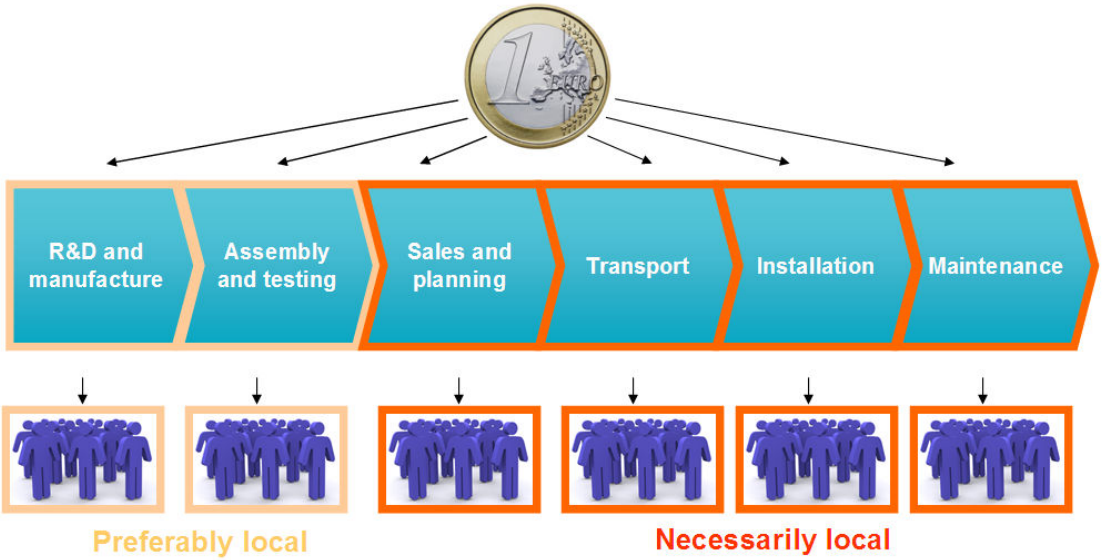
Green Jobs Created by Wind Energy Deployment

	65,9 GW installed 154,000 jobs created
	22,3 GW installed 80,000 jobs created
	14,7 GW installed 31,500 jobs created
	3,1 GW installed 21,600 jobs created
	25 GW installed 85,000 jobs created
	12,2 GW installed 40,000 jobs created



Sources: EWEA 2009, AWEA 2009, CREIA 2009, Vestas 2009

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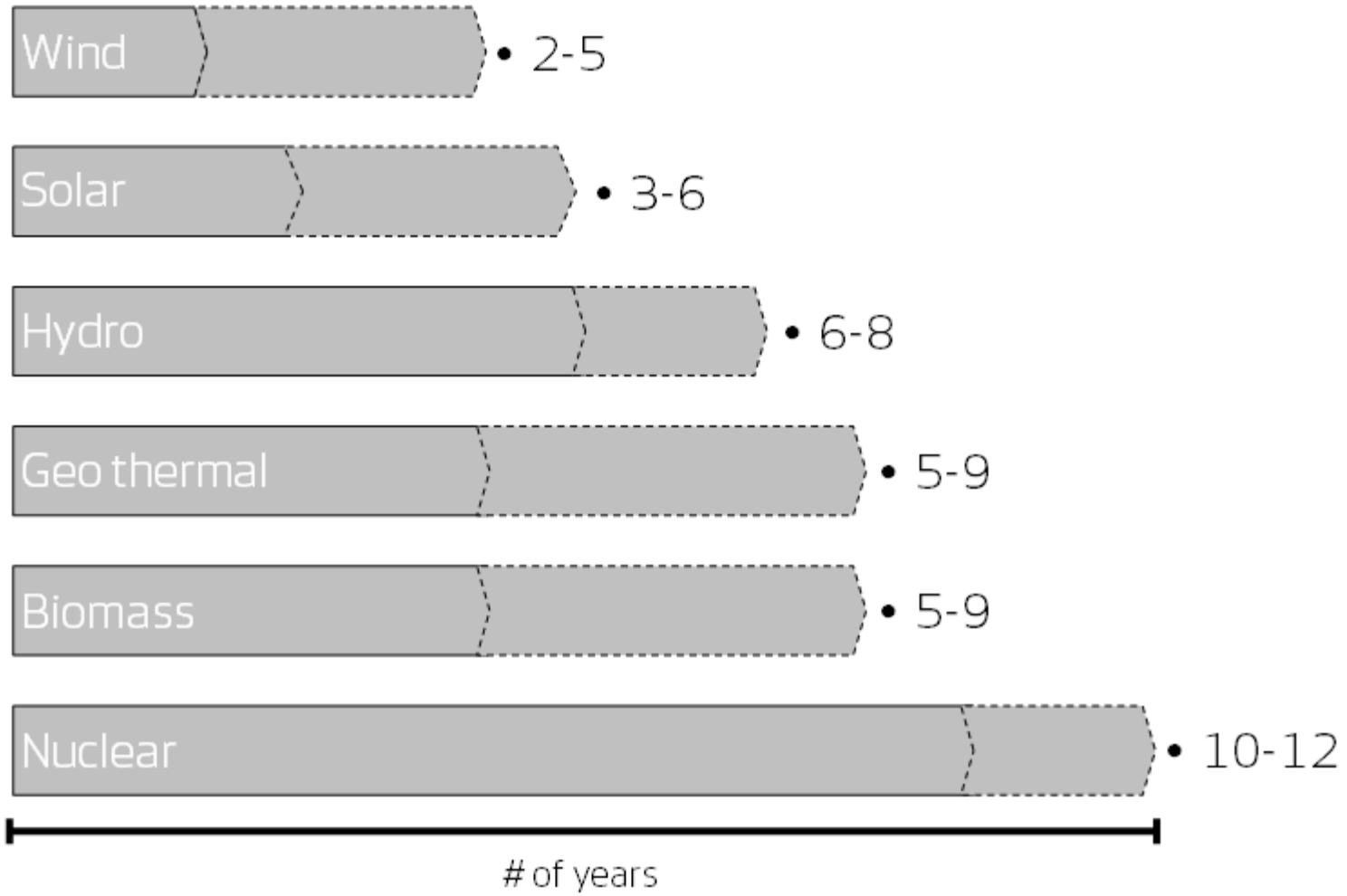
Fast Ramp Up & Low Lead Time



Sources: FPL Energy 2008, IEA 2008, EWEA 2009

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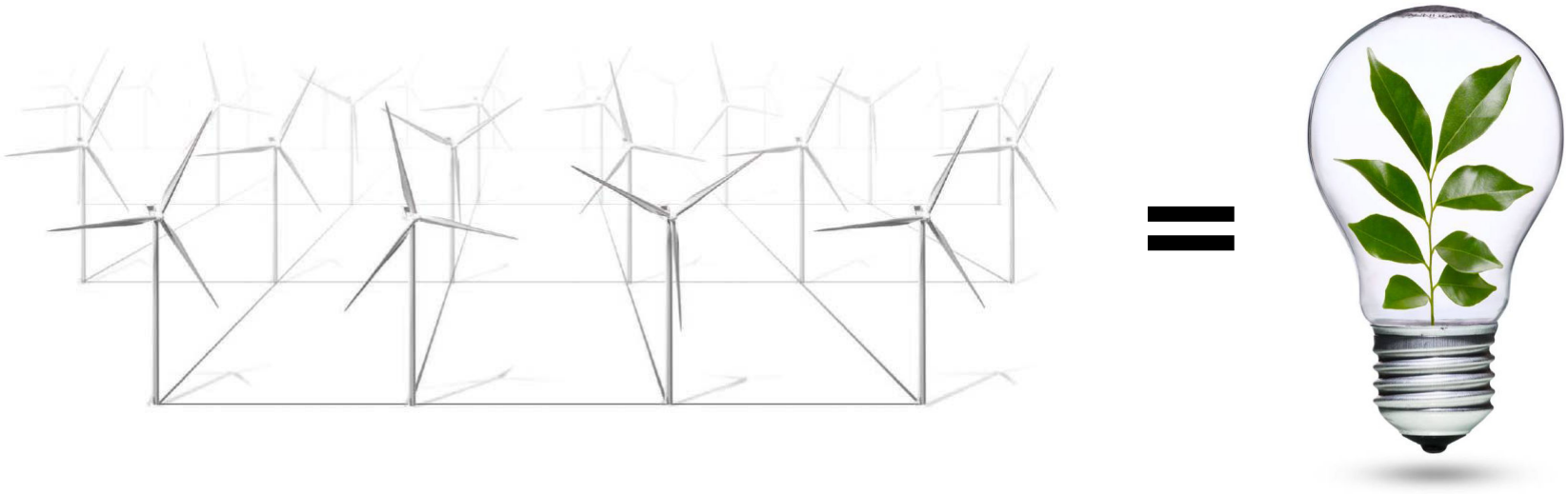
Clean Technology with No Fuel Costs



A Vestas V90 3.0-MW turbine alone is carbon neutral after only seven months of energy production; during its lifetime it saves the atmosphere from 220,000 tons of CO2

In conclusion…

Wind power is a key technology option for Azerbaijanian power generation

Because Wind Energy is…

Competitive

Predictable

Independent

Fast

Clean

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