U.S. IS WORLD’S #1
WIND ENERGY PRODUCER

U.S. 190.9 MILLION MWh
CHINA 185.1 MILLION MWh

GERMANY 84.6 MILLION MWh
SPAIN 47.9 MILLION MWh

Source: GWEC, EIA, 2015
Recent additions to the U.S. power grid

- **2010-2015**: Wind was 28% of all new electric generating capacity
- **2015**: Wind #1 with ~34%, Solar ~29%, Gas ~24%

75 gigawatts of U.S. wind power, led by Texas

Mainstream power, reliably integrated

Source: AWEA Annual Market Report 2014
Jobs in wind power across America

Source: AWEA Annual Market Report 2014
Lower wind costs include economies of scale
Reasons for falling wind costs

• Economies of scale (turbines, companies)
• Technology accessing higher winds
• Policies now predictable
• Optimized siting
• More transmission to cities
• Predictive O&M
• U.S. manufacturing
Wind energy costs still falling, capacity factors still rising

Impact on Levelized Cost of Energy of Assumed Factors (% Change)

- Wind turbine cost: 100% (2015), 81.5% (2025)
- BoP & development: 100% (2015), 4% (2025)
- Capacity factor improvement: 100% (2015), -8.7% (2025)
- OPEX: 21% (2015), 112% (2025)
- Interests: 13% (2015), 2% (2025)
- Tax: 12% (2015), 5% (2025)

Net Capacity Factor Improvement (% Change)

- Larger rotor: 4% (2025)
- Higher tower: 2% (2025)
- Site tailored design/real-time control: 5% (2025)
- O&M best practice: 2% (2025)
- 2025: 112%
Wind cost vs. gas cost
2012-2022

Source: NREL
Boom-bust cycle is over with 5-year PTC

Wind power is increasingly cost-competitive
The U.S. wind resource

- Wind could power more than 13 times U.S. electricity needs
- New technology is reaching higher winds, making wind energy possible in new regions of the country
Wind Vision: 10% by 2020; 20% by 2030

Source: DOE Wind Vision and AWEA Market Data
Major brands purchasing wind to cut costs & carbon
Bipartisan support for wind energy holds firm

Gallup, *Annual Environment Poll*, March 5-8, 2015:
- 70% say U.S. should put more emphasis on producing more domestic energy from wind; 14% say the same emphasis as now
- Among Republicans, 63% want more emphasis on wind

- 74% support extending federal tax incentives for wind and solar
- 87% think renewable energy is important to the country’s future

Public Opinion Strategies, for *Pew Charitable Trusts*, March 2015
- 77% support increasing the use of wind energy
- 75% describe renewable energy as reliable
- 68% support restoring wind energy PTC, 47% “strongly support”
Wind is America’s energy future

2008 DOE: Wind can supply 20% of U.S. electricity

2015 DOE: Wind can supply **35%** of U.S. electricity
Corporate purchasing of wind power rising sharply

- Corporations like Apple, Google, Microsoft, and others are increasing their purchases of wind power.
- In 2015, the total corporate purchases reached 3092 MW.
- Companies such as Salesforce, Equinix, Amazon, and Equinix have significant purchases.
- The chart shows a significant increase in wind power purchases from 2008 to 2015.
**WHY COMPANIES ARE TURNING TO WIND POWER**

**GOOGLE**

“Because energy is a large operating expense at Google, it is beneficial to power the data centers with low-cost wind power.”

**DOW CHEMICAL**

“Dow is always looking for win-win solutions – good for the environment and good for business. By entering into this agreement, Dow is taking a serious approach to our future energy needs in Texas and cost-competitive wind energy is a great opportunity.”

**IKEA**

“The US has amazing wind and sun resources that will never run out. We are delighted to make this investment – it is great for jobs, great for energy security, and great for our business. Importantly, it’s great for the future of our climate.”

**YAHOO!**

“At Yahoo, we’re committed to being an environmentally responsible company...Driving the development of cleaner and renewable sources of power is an important piece of our sustainability strategy.”

**MICROSOFT**

“The Pilot Hill Wind Project is important to Microsoft because it helps solidify our commitment to taking significant action to shape our energy future by developing clean, low-cost sources to meet our energy needs.”

*Courtesy of Jean-Jacques Halans*
How much wind demand the Clean Power Plan will drive

Source: EIA
Wind is key to Clean Power Plan compliance

Reduction of CO₂ emissions rate from wind projects, 2012-2030

Sources: AWEA U.S. Wind Industry Annual Market Report Year Ending 2015; EPA
Trend: New lines access vast supply of low-cost, carbon-free wind

Recently developed lines

Source: AWEA 2015 Annual Report. Wind project capacity includes projects under construction.
High-voltage DC lines coming
U.S. offshore: the next frontier
THANK YOU!

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