



Distributed Wind 2016



Investment Tax Credit Update

Moderator

Alice Orrell, Pacific Northwest National Laboratory

Speakers

James Duffy, Nixon Peabody LLP

Lloyd Ritter, Green Capitol, LLC

ITC FOR DISTRIBUTED WIND DISTRIBUTED WIND 2016 DWEA

Jim Duffy, Partner, Nixon Peabody LLP
jduffy@nixonpeabody.com
February 23, 2016

NIXON PEABODY

RECENT LEGISLATION

- Two acts, approved by the Congress, were signed by the President on December 18, 2015:
 - › Consolidated Appropriations Act, 2016 (the “Appropriations Act”); and
 - › Protecting Americans from Tax Hikes Act of 2015 (the “PATH Act”)

RECENT LEGISLATION

- › The Appropriations Act addresses wind and solar.
- › The PATH Act addresses Production Tax Credit (“PTC”) technologies other than wind (i.e., biomass, geothermal (for electricity), landfill gas, municipal solid waste, qualified hydropower, and marine and hydrokinetics), as well as certain other fuels and Indian coal.
- › There are no changes to the Investment Tax Credit (“ITC”) for fuel cells, microturbines, cogeneration and geothermal (for heat).
- › Also, no changes for the small wind ITC.

PTC FOR WIND

- Prior to the Appropriations Act, to be eligible for the PTC, construction must have begun by 2014
- The PTC for 2015 was 2.3 cents per kilowatt hour of electricity produced and sold to an unrelated third party, a price which is annually adjusted for inflation
- Now, construction must begin by December 31, 2020, but the PTC is reduced over that time
- If construction begins in 2015 or 2016, the PTC is not reduced
- If construction begins in 2017, the PTC is reduced by 20%
- If construction begins in 2018, the PTC is reduced by 40%
- If construction begins in 2019, the PTC is reduced by 60%
- There is no wind PTC if construction does not begin by December 31, 2019

ITC FOR WIND

- There is now a similar phase-down of the 30% ITC for wind projects opting out of the PTC into the ITC
- If construction begins in 2015 or 2016, the ITC remains at 30%
- If construction begins in 2017, the ITC is reduced by 20%, to a 24% ITC
- If construction begins in 2018, the ITC is reduced by 40%, to an 18% ITC
- If construction begins in 2019, the ITC is reduced by 60%, to a 12% ITC
- There is no wind ITC if construction does not begin by December 31, 2019

PTC FOR TECHNOLOGIES OTHER THAN WIND

- Biomass, geothermal (for electricity), landfill gas, municipal solid waste, qualified hydropower, and marine and hydrokinetics are now eligible for the full PTC for which they were eligible before the recent legislation if construction begins in 2015 or 2016
- These facilities are also eligible to elect the full ITC if construction begins in 2015 or 2016
- There is no phase down for these facilities; if construction does not begin by December 31, 2016, then there is no PTC and no ITC

ITC FOR SOLAR

- Solar has not been eligible for the PTC since 2005, so solar can claim only the ITC
- Prior to the recent legislation, solar was eligible for a 30% ITC if placed in service by December 31, 2016 and a 10% ITC if placed in service thereafter
- Under the recent legislation, the solar ITC has been provided an extended and gradual phase down.
- Also, the solar paradigm has moved from placement in service to beginning construction

ITC FOR SOLAR

- If construction begins in 2016, 2017, 2018 or 2019 and the facility is placed in service by December 31, 2023, there is a full 30% ITC
- If construction begins in 2020 and the facility is placed in service by December 31, 2023, there is a 26% ITC
- If construction begins in 2021 and the facility is placed in service by December 31, 2023, there is a 22% ITC
- If construction does not begin by December 31, 2021 or the facility is not placed in service by December 31, 2023, there is a 10% ITC
- The 10% ITC is a permanent provision

ITC FOR OTHER TECHNOLOGIES

- The ITC for other technologies continues to require placement in service by December 31, 2016
- This covers fuel cells, microturbines, cogeneration and geothermal (for heat)
- The separate small wind (under 100kW) ITC was also not extended
- However, there is no size requirement on the wind PTC and the ability of a wind facility to opt out of the PTC into the ITC

ITC FOR WIND

- Note that wind facility does not have to meet all of the requirements to claim the PTC in order to opt out of the PTC into the ITC
- A facility must be a “qualified facility” under the PTC provisions in order to opt into the ITC
- A facility using wind to produce electricity is a “qualified facility” under the PTC provisions
- The PTC requirement of electricity sales to an unrelated person is separate from the determination of a “qualified facility”

BONUS DEPRECIATION

- Depreciation is a writing down, or amortizing, of the cost of an asset
- Renewable energy facilities are generally depreciated over 5 years, using 5-year MACRs
- Depreciation “losses” can be used to offset income and reduce taxable income (subject to certain requirements)
- Bonus Depreciation does not mean “extra” depreciation, but the ability to claim depreciation on a more accelerated basis

BONUS DEPRECIATION

- For 2012, 2013 and 2014, 50% Bonus Depreciation was available, so that 50% of a facility's depreciable basis could be claimed the day the facility was placed in service, and the remaining 50% would be claimed over five-years, using five-year MACRs
- Under the PATH Act, 50% Bonus Depreciation was extended for facilities placed in service in 2015, 2016 and 2017
- Also, a phase-down was provided of 40% Bonus Depreciation for facilities placed in service in 2018 and 30% Bonus Depreciation for facilities placed in service in 2019



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Distributed Wind 2016



Developing New Markets

Moderator

Britton Rife, eFormative Options

Speakers

Lisa Daniels, Windustry

Ed Doody, Owner, Lawrence Doody and Sons, LLC

Heather Rhoads-Weaver, eFormative Options

Darrin Russell, Northern Power Systems

Community Wind “It Takes a Village”



Lisa Daniels
Executive Director
Windustry

Washington, DC
February 23, 2016



Who is Windustry?

- Non-profit organization based in Minneapolis, MN - locally, regionally and nationally
- Focus on landowner/community options for community-scale renewable energy
- Lead partner in Midwest Regional Wind Energy Center (MWEC)
- Promote supportive state and national policy droessler1066@gmail.com
- www.windustry.org



What is Community Wind Energy



- Simple and flexible concept
- Any size project
- Energy to offset own use or sell wholesale (generation can be on either side of the meter)
- Distributed Energy - fits on local electrical grid

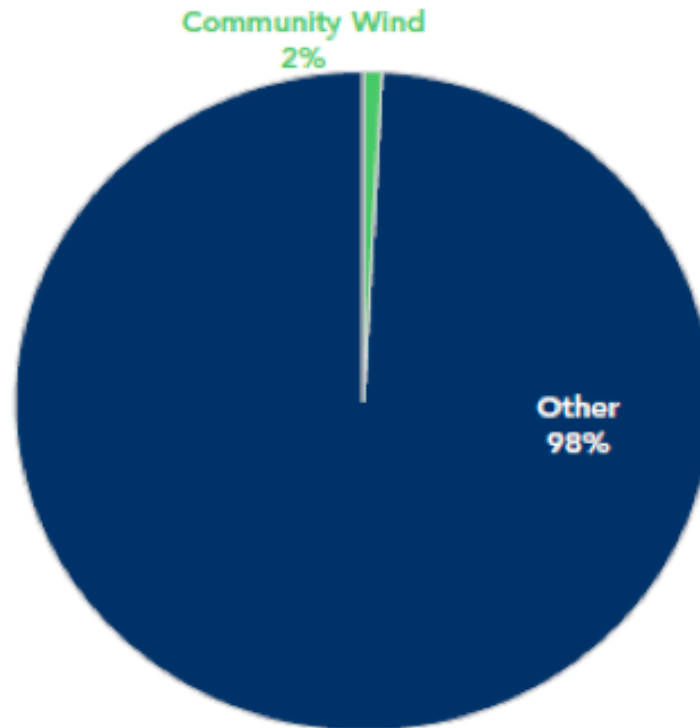
■ KEY Goals:

- Local investment, ownership, control
- Optimize local benefits

Community Wind: A Small Slice but Great Potential

Figure 42

Community Wind Ownership of U.S. Wind Power Projects Installed during 2014



Types of Community Wind

- Community owned wind
- Community shared wind
- Corporate Wind
- Virtual Power Plants

Local Solutions

- Voluntary Green Power Producer vs Compliance
- Getting the projects counted on state and federal basis
- Rank higher than REC procurements

Local/Community Success Stories across the US

- Farmer and Local Investors
- Municipalities/Muni Utilities
- Rural Electric Cooperatives
- Schools K-12, Colleges
Universities
- Tribal Communities
- Public/Private Partnerships
- Businesses
- Potential for many more...



Spirit Lake, Iowa

In Closing

- Be Innovators
- Work Together
 - Smart Wind Roadmap to Smooth out the Manufacturing
 - Get communities “Wind Ready”
 - Use creative finance methods
- Launch a Scouting Mission

Waste Water and Distributed Renewable Energy

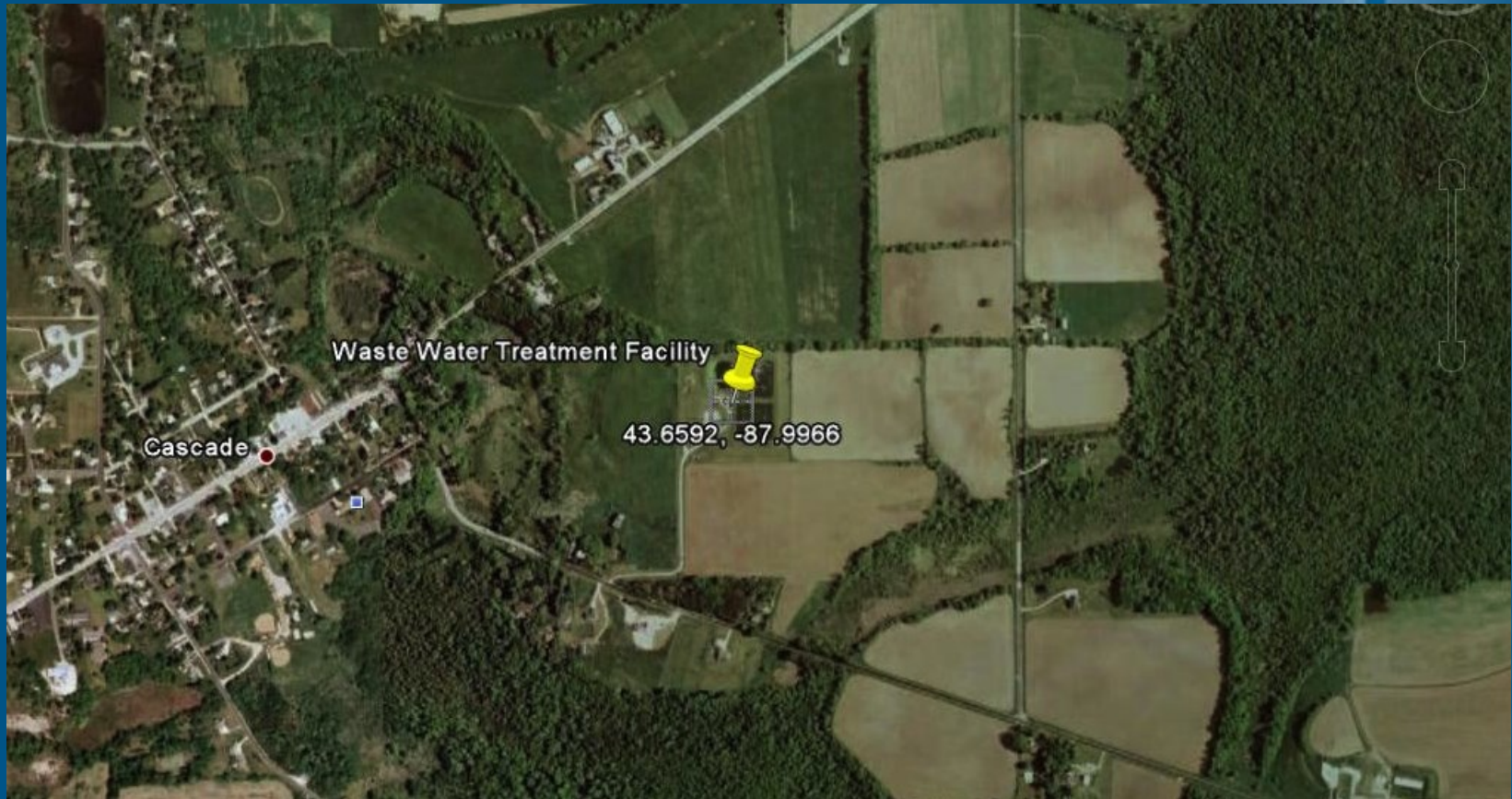
- It's a good match
 - 24/7 use of energy
 - High energy user
 - Usually sited away from densely populated neighborhoods
 - Well suited to moving and storage of water

2010

Cascade Village, Wisconsin

- 130,000 gpd aerated natural pond treatment plant
- serves 700 customers in & near village
- Installed two 100 kW wind turbines
- Ave annual electrical savings, \$30,000
- Savings approx. 10% of annual budget of \$330,000

After 2 years of studying options – Cascade selected an action plan



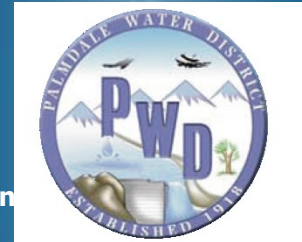


Palmdale Water District, Diverse Renewable Generation Portfolio

- 250 kW hydroelectric generator
- 250 kW digester gas-powered fuel cell that turns exhaust into electricity and heat
- 30 kW of solar PV
- 950 kW wind turbine
- PWD saves over \$250,000 per year in electricity costs



Wind turbine, solar panels, and hydro electric dam



Photos courtesy of Palmdale Water District



Methane gas digester system

Atlantic City, NJ



Water and Waste Water Treatment Facilities & Wind/Solar

- City of Seadrift, TX 2011 Water
- Town of Tuscola, IL 2011 WW
- Guthrie, OK 2011 Water
- Evansville, Wi 2010 Water
- Talbot County, MD 2010 Public Works
- Prince Edward Is., Canada 2009 Water
- Deer Island, Boston Harbor 2012 WW
- Atlanta City, NJ 2005 WW

And More

- Barnstable MA
- Richland NY
- Lynn MA
- Middlesex County NJ
- Hammonton NJ
- Adair Iowa





Distributed Wind 2016

About Doody Farm

- 300 milking head
- Family run business
- Located in Otisco, NY
- Longstanding

TURBINE STATE

- Generating
- Freewheeling
- Waiting for Wind
- Shut Down

Rotor speed 40.8 rpm

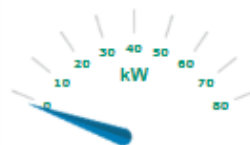
WIND SPEED



3.9 m/s

5-min avg 3.8 m/s
24-hr peak 8.4 m/s

POWER



-2.5 kW

5-min avg -0.9 kW

ENERGY

Last 24 Hours

201.0 kWh

Total

471,680 kWh

HOME

MONITOR

CONTROL

HISTORY

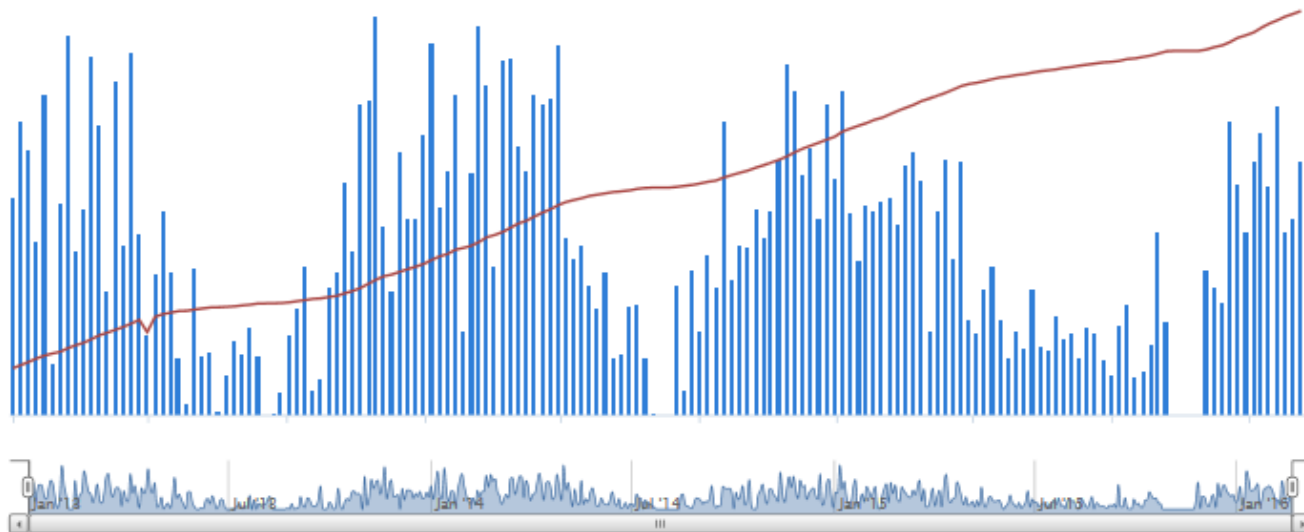
ADMIN

Energy

Wind Speed

Zoom 1m 3m 6m YTD 1y All

From Jan 1, 2013 To Feb 21, 2016



[i explanation of energy chart data](#)

Disclaimer: All information presented in the above charts is for general information only. Endurance Wind Power Inc. does not make any express or implied representation or warranty as to the accuracy or completeness of the data, and the end user agrees that Endurance Wind Power Inc. shall have no liability relating to such data, or its use, or for any errors or omissions therefrom.



Distributed Wind 2016

State Markets and Policies

Heather Rhoads-Weaver

Market, Policy & Development Consultant

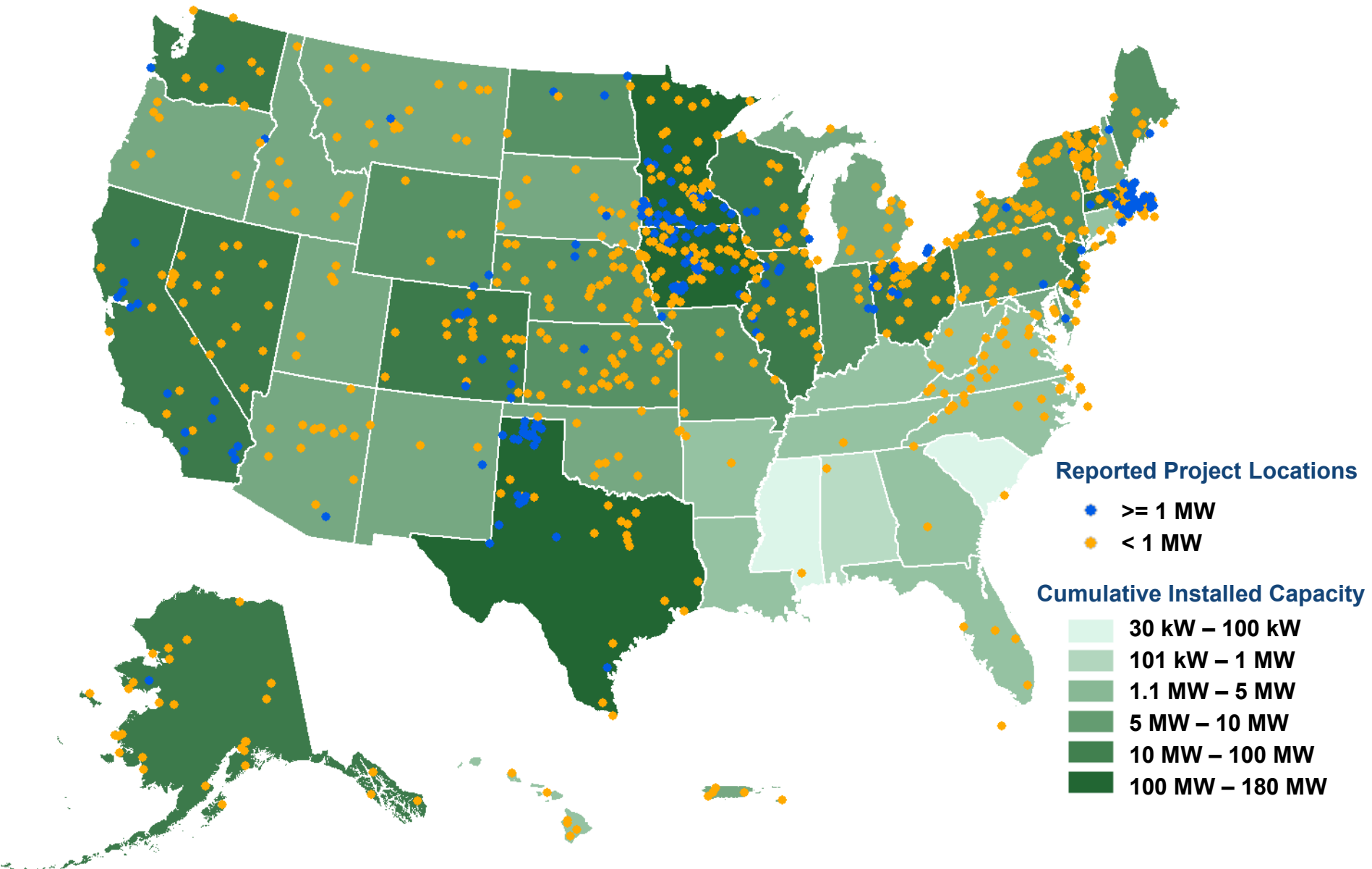


Thanks also to: Matt Gagne & Britton Rife, EFO; Alice Orrell, PNNL;
Ian Baring-Gould, NREL; Russell Tencer, United Wind

February 23, 2016

DW16 – Washington, DC

Distributed Wind Installed Capacity



Source: eFormative Options, U.S. DOE 2013 Distributed Wind Market Report

Top States for Distributed & Small Wind Capacity

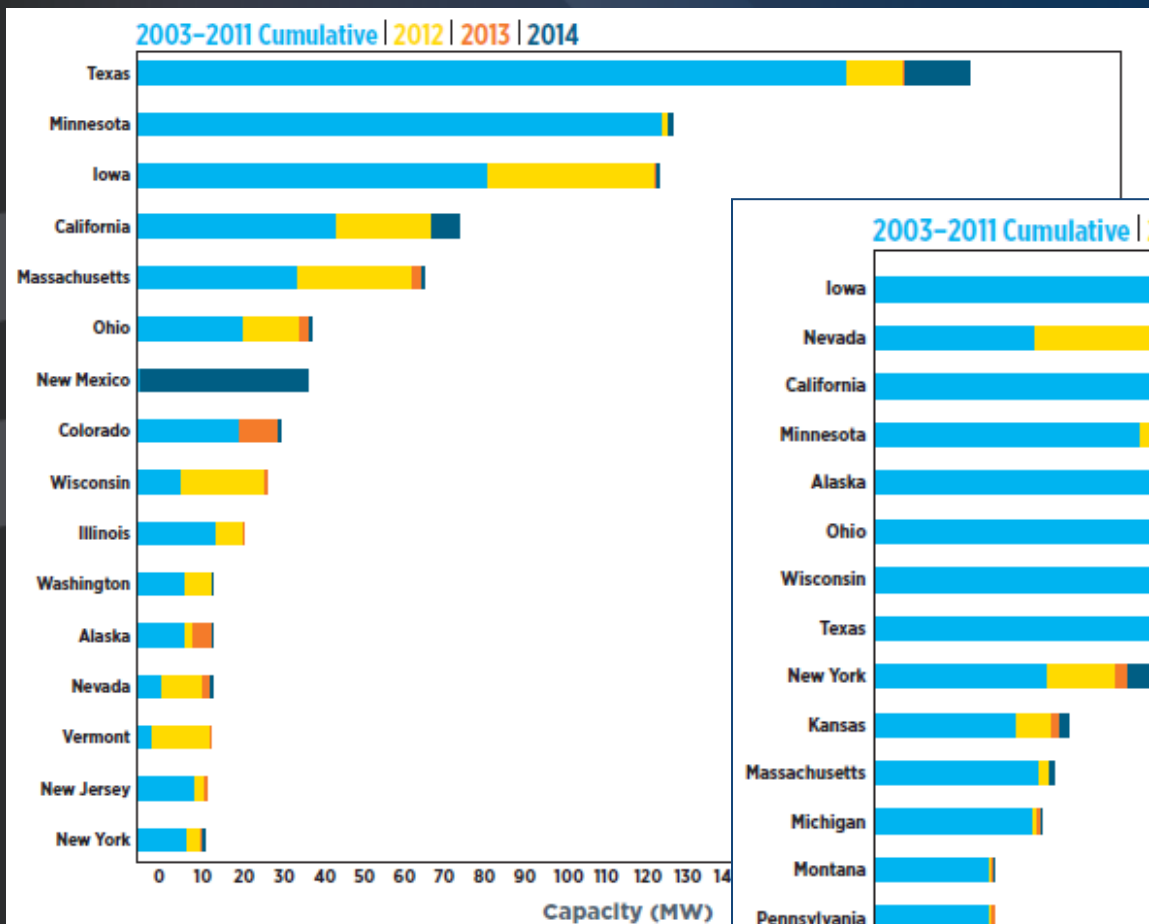


Figure 7: Top States for Distributed Wind

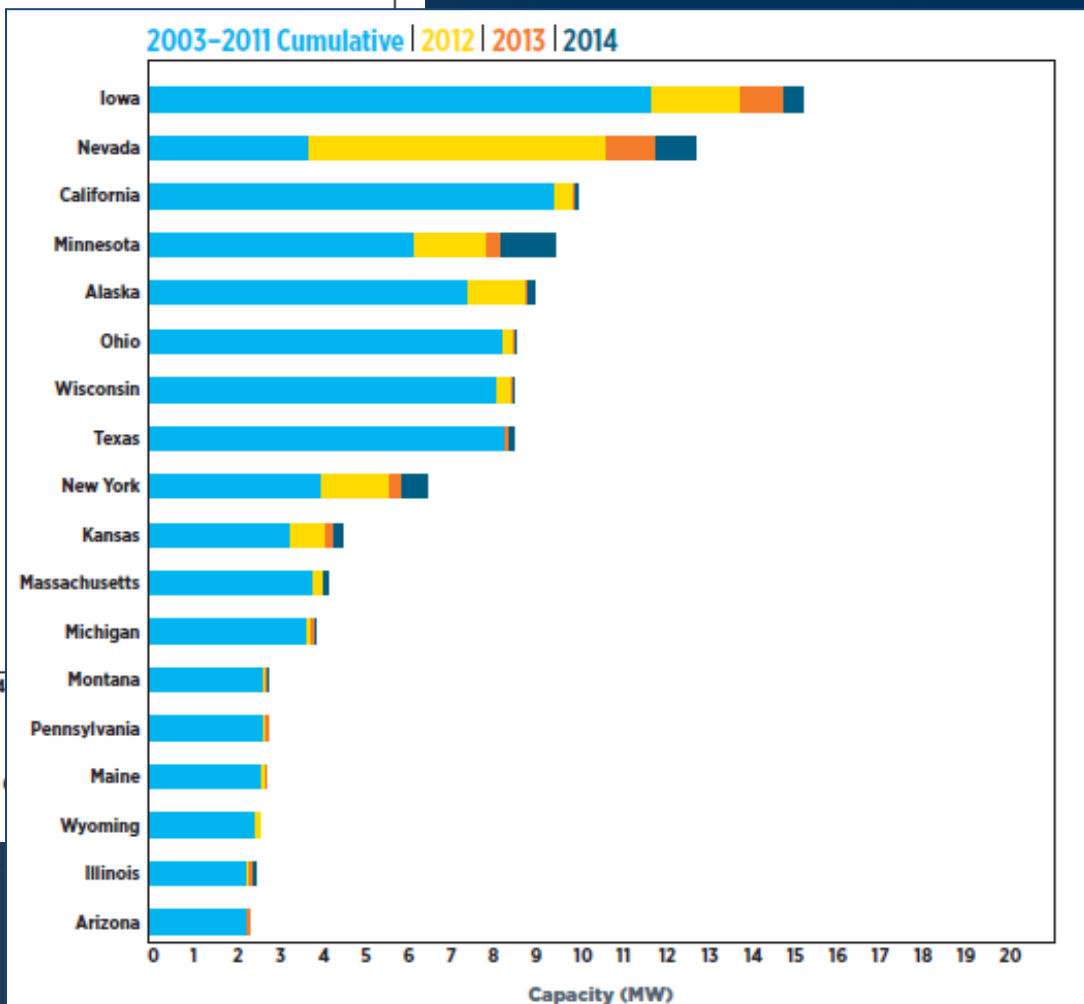


Figure 8: Top States for Small Wind Capacity, 2003-2014

DISTRIBUTED WIND Policy Comparison Tool

Version 3.2 Last Policy Update 9/14/15



SCENARIO	CAPITAL COST	FINANCIAL	FEDERAL	STATE	TECHNICAL
----------	--------------	-----------	---------	-------	-----------

1) SELECT A STATE

Select your state of interest in the selector below or the map to the right.

New York



2) SELECT A SCENARIO

Select your sector of interest below. Additional turbine models can be selected on the Technical tab.

- Residential - 1.5 kW (100 ft tower)
- Residential/Farm - 8.9 kW (121 ft tower)
- Non-Taxed - 90 kW (121 ft tower)
- Commercial - 57 kW (138 ft tower)

NOTE: Tower heights shown are not allowed in every jurisdiction. Funding is not always available for all incentives as shown.

[Click here for printable User Tips](#)

[Click here for the Updated User Guide](#)

3) REVIEW RESULTS

Examine the results in the RESULTS window. To examine the effect of different policies and project costs, adjust inputs for system Capital Cost, Financial factors, and Federal and State incentives on the respective tabs.

CURRENT SCENARIO

STATE

New York

SECTOR

Residential

WIND CLASS

Mid Class 2

TURBINE MODEL

1.5 kW Pika T701

TOWER TYPE

100 ft guyed monopole

ANNUAL ENERGY PRODUCTION

2,773 kWh/year

RESULTS

INTERNAL RATE OF RETURN

7.31%

PAYBACK

11 years

NET PRESENT VALUE

\$726

COST OF ENERGY

\$0.20/kWh

[WHAT'S NEW](#)

[ABOUT](#)

[HELP](#)

[FEEDBACK](#)

[PRINT](#)

[RESET](#)



www.windpolicytool.org

Policy Tool: Annual Updates

www.windpolicytool.org

- ▶ Some state incentive programs have ended, but NY, OR, NV, MD, WA, CA, IL, and a few others still have programs for distributed wind
- ▶ Due to net metering being more widely available, the scenarios assuming **retail value for all power produced** has increased from 13 states last year to 34 states now
- ▶ To receive notification of updates, sign up at www.eformativeoptions.com/maillist/

Click here to sign up for
**Updates
and News** ▶

from eFormative Options

DISTRIBUTED WIND Policy Comparison Tool

Version 3.2 Last Policy Update 9/28/15



SCENARIO CAPITAL COST FINANCIAL FEDERAL STATE TECHNICAL

STATE POLICIES & INPUTS TAX INCENTIVES REBATES & INCENTIVES

?	PBI Rate (Rebate or Grant)	<input type="range"/>	Custom Value	Baseline Value	\$0.00/kWh
?	PBI Rate (Production-based)	<input type="range"/>	Custom Value	Baseline Value	\$0.12/kWh
?	Capital Cost Rebate - Flat Rate	<input type="range"/>	Custom Value	Baseline Value	\$0.00
?	Capital Cost Rebate - Incremental Rate	<input type="range"/>	Custom Value	Baseline Value	\$0.00
?	Capital Cost Rebate - Flat Production-Based Rate	<input type="range"/>	Custom Value	Baseline Value	\$0.00
?	Capital Cost Rebate - Incremental Production-Based Rate	<input type="range"/>	Custom Value	Baseline Value	\$0.00
?	Capital Cost Rebate - Massachusetts	<input type="range"/>	Custom Value	Baseline Value	\$0.00

NOTE: Funding is not always available for all incentives as shown. Refer to individual program websites linked via DSIRE to verify details, waiting lists, and eligibility requirements.

See Assumptions and Notes on rebates

CURRENT SCENARIO

STATE: Washington

SECTOR: Commercial

WIND CLASS: Low Class 3

TURBINE MODEL: 8.9 kW Bergey EXCEL

TOWER TYPE: 140 ft guyed lattice

ANNUAL ENERGY PRODUCTION: 24,260 kWh/year

RESULTS

INTERNAL RATE OF RETURN: 5.87%

PAYBACK: 10 years

NET PRESENT VALUE: -\$3,126

LEVELIZED COST OF ENERGY: \$0.11/kWh

WHAT'S NEW ABOUT HELP FEEDBACK PRINT RESET



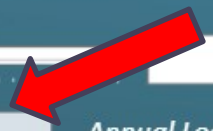
DISTRIBUTED WIND Policy Comparison Tool

Version 3.2 Last Policy Update 9/28/15



SCENARIO CAPITAL COST FINANCIAL FEDERAL STATE TECHNICAL

Equity Contribution		Custom Value	25%	Baseline Value	100%
Loan Term		Custom Value		Baseline Value	20 years
Loan Interest Rate		Custom Value	4.500%	Baseline Value	8.000%
Total Loan Amount	\$48,900		Annual Loan Payment	\$3,759	
Discount Rate		Custom Value		Baseline Value	6%
Average Cost Escalation Index Rate		Custom Value		Baseline Value	1.018
Average Electricity Price Escalation Index Rate		Custom Value		Baseline Value	1.004
Lease Term		Custom Value		Baseline Value	20 years
Annual Lease Payment		Custom Value		Baseline Value	\$0



CURRENT SCENARIO

STATE: Washington

SECTOR: Residential

WIND CLASS: Low Class 3

TURBINE MODEL: 8.9 kW Bergey EXCEL

TOWER TYPE: 140 ft guyed lattice

ANNUAL ENERGY PRODUCTION: 24,260 kWh/year

RESULTS

INTERNAL RATE OF RETURN: Not Applicable

PAYBACK: 10 years

NET PRESENT VALUE: -\$3,776

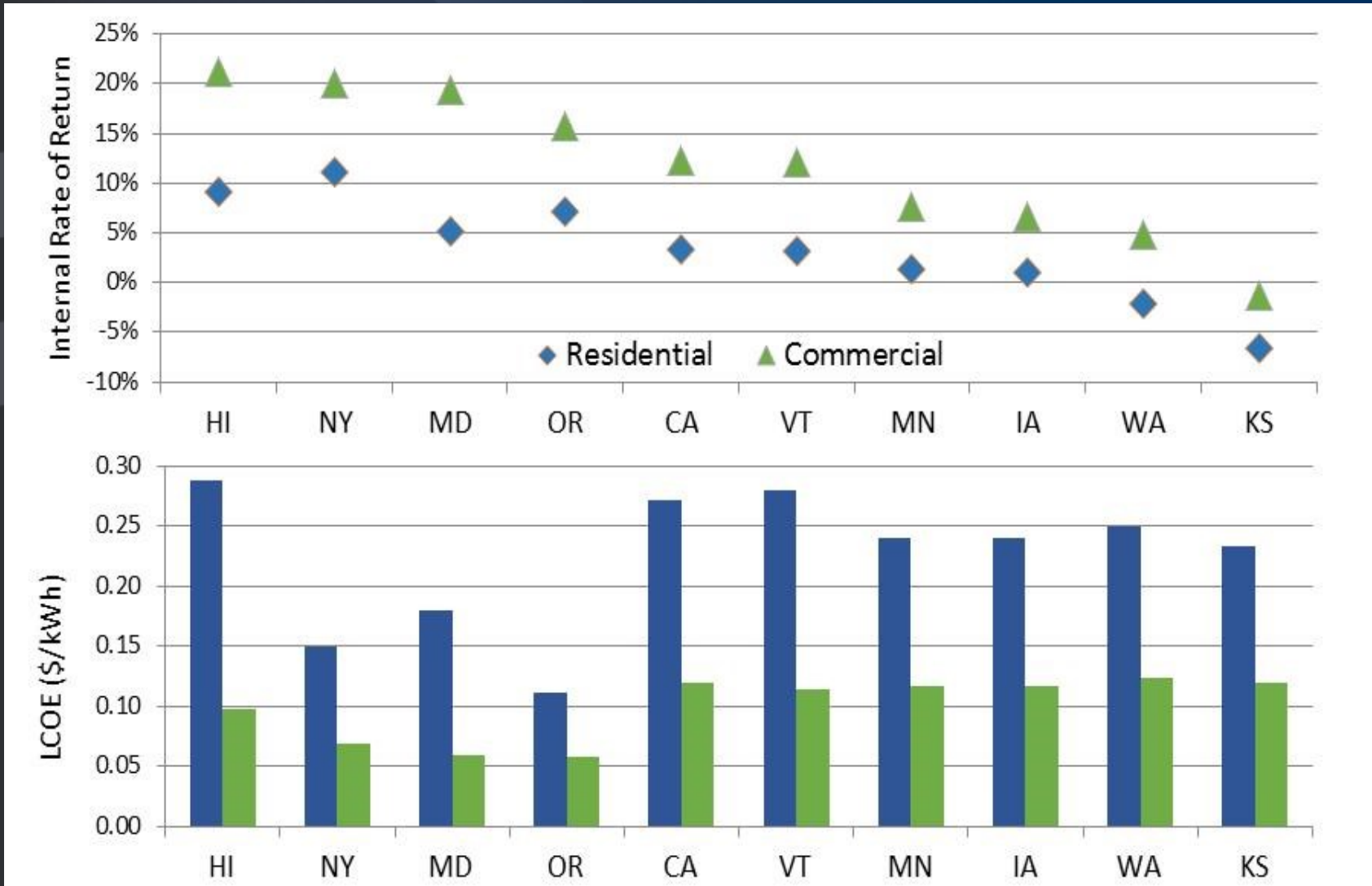
LEVELIZED COST OF ENERGY: \$0.23/kWh



WHAT'S NEW ABOUT HELP FEEDBACK PRINT RESET



Results of Selected Scenarios as of Fall 2015



- Commercial sector national average LCOE is now 12.4 cents/kWh
- U.S. average commercial retail electricity rate is 11.5 cents/kWh

Review of Near-Term State Markets

- Compared Policy Tool results to other approaches evaluating market potential, particularly considering wind resources and energy prices
- EFO revised ranking with some adjusted assumptions to wind resource & incentive assumptions (e.g. KS net metering, WA PBI extension)
 - IA & MN are clearly in the top tier; CA, IL, and CO are also confirmed by all three models as strong states
 - KS and WA are supported by two, and NY is highest on EFO's IRR ranking – could continue to be a strong market if incentive extended
 - Other states that rank high by two of the models include: MT, MA, TX, VT, WI, OH, NJ, IN & NV
- Did not evaluate political opportunity/constraints – after considering near-term priorities, DWEA is investing with lobbyists in NY, IA, MN, and WA, and watching for opportunities to engage in CA, KS & CO
 - Other 2nd tier states listed above and even a few 3rd tier states including PA, ME, HI, AK should be monitored for “easy wins” such as working to add DW into a solar initiative



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*Thanks to U.S. DOE,
PNNL and all contributors!*

Market Analysis

- Economic impacts
- Data compilation/research

Development Consulting

- Launching new ventures
- Critical path coaching
- Grant applications

Public Affairs

- Community outreach
- Stakeholder awareness

Project Management

- Strategic planning
- Facilitation, consensus

www.windpolicytool.org



SMART Wind Roadmap Release Party

June 13-14, Stevens Point, WI

www.smallwindconference.org



Distributed Wind 2016



Northern Power Vertical Integration and Wind Power Lease

NPS Sales & Marketing

Confidential

January 2016

Northern Power—International Reach

Over 500 turbines commissioned worldwide



Northern Power Facilities and Locations

- Headquarters in Barre, VT
- Offices throughout U.S., UK, Italy, Switzerland, Massachusetts
- 120,000 ft² manufacturing facility in Barre
- 100 employees

Barre, VT manufacturing facility



Confidential



Confidential

Northern Power Vertical System Integration



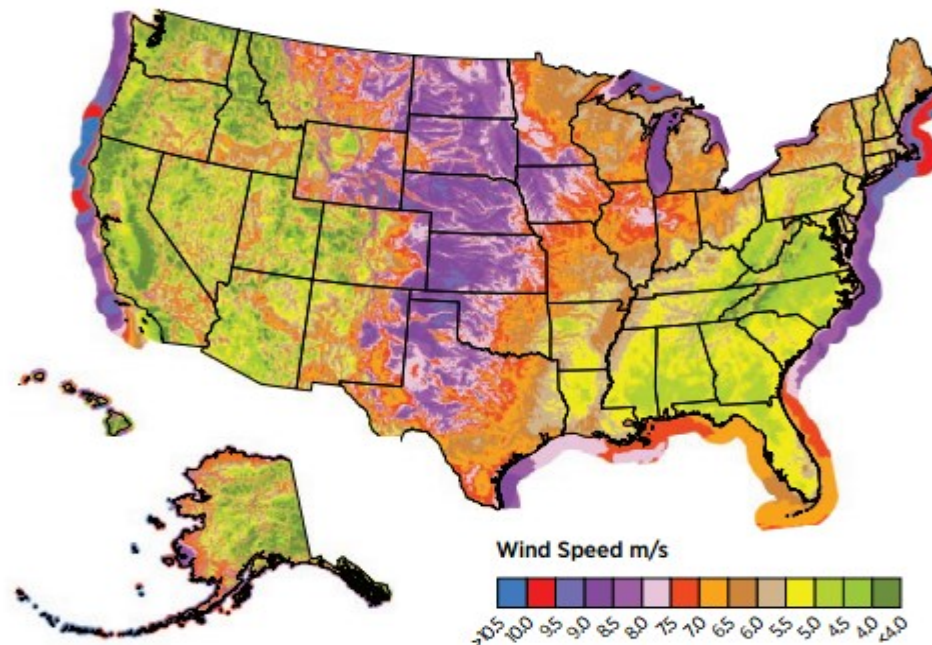
- **NPS, From Start To Finish**



Start With Good Wind Resource

- ❖ Find good windy areas in Midwest and on the coast
- ❖ Analyze utility rate for commercial sector
- ❖ Partner up with lease finance provider to take advantage of ITC & REC's
- ❖ Offering a '100% financing' lease model for business owners in key states:

➤ Wind Power Lease!

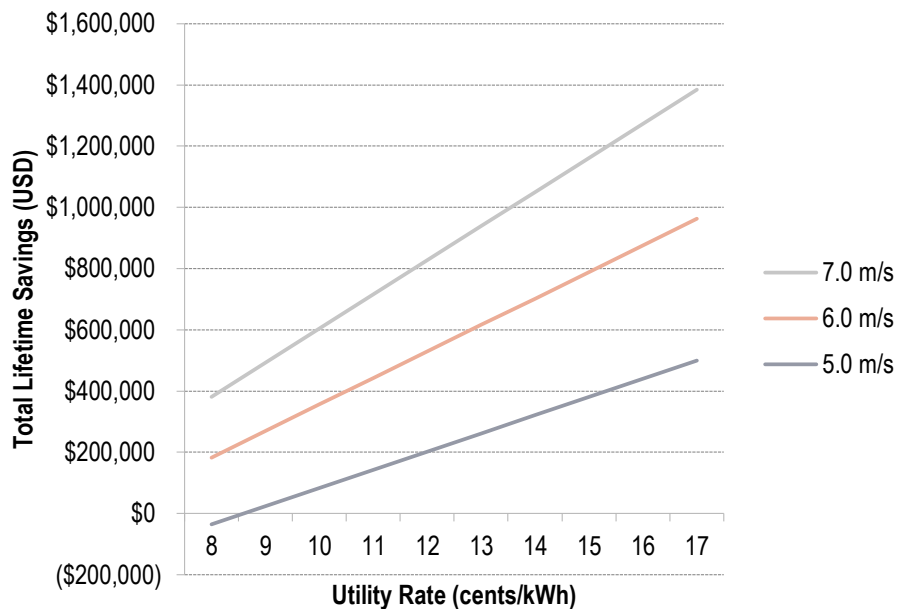


Target Highest Probability Markets

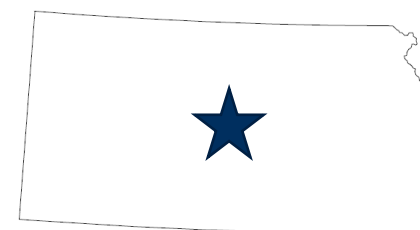
❖ Identify sites in NY (through NYSERDA time-line), KS and CO, that have:

- Wind 5.3-7.4m/s
- Commercial rate 8-14 cents
- Energy demand 200kW-400kW pa

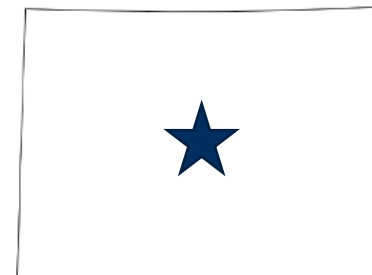
Quick Site Eval Tool



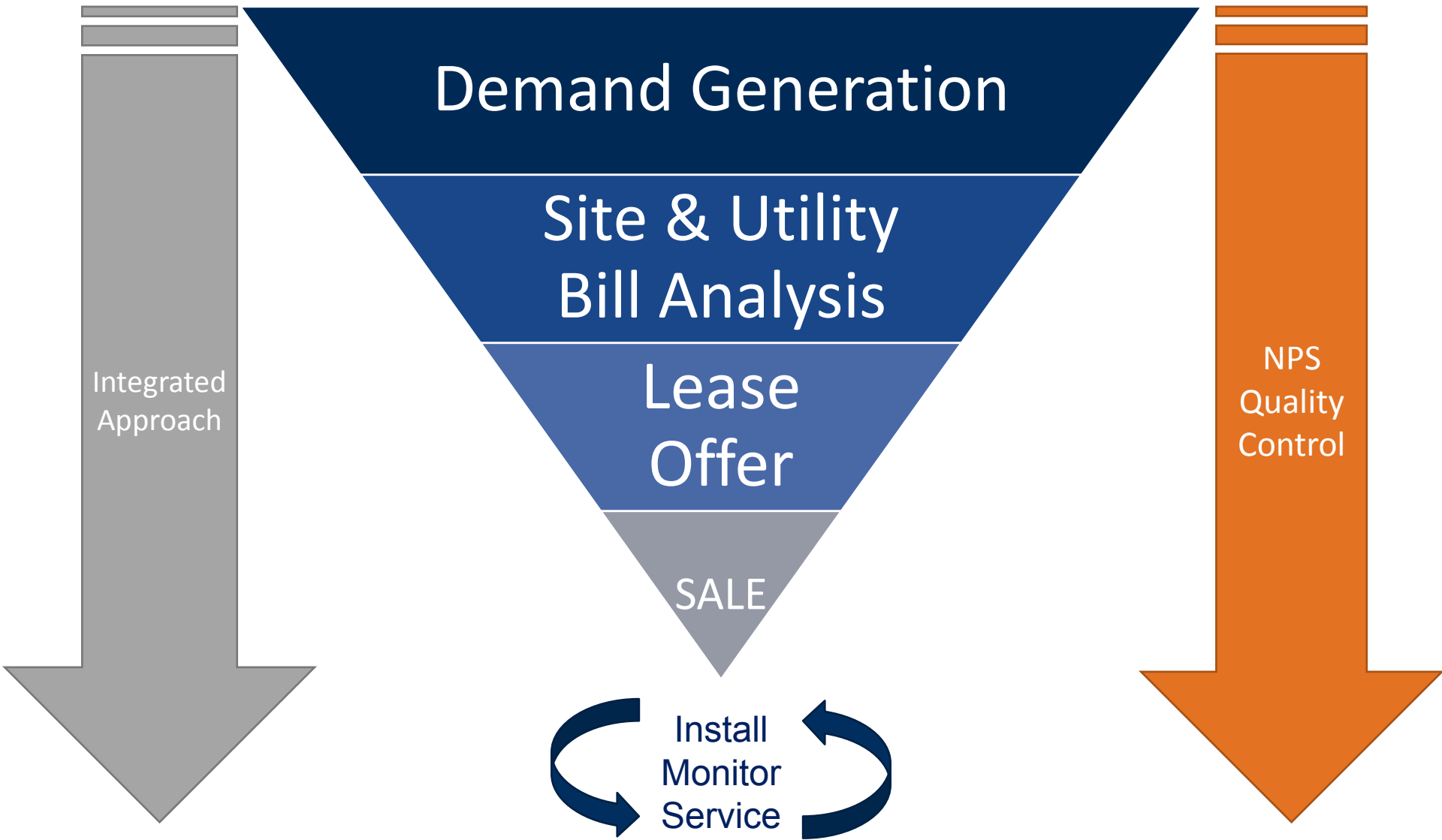
Kansas



Colorado



Sales Process



Log Process in CMS

- ❖ All leads, whether inbound or outbound are logged in SFDC

The image shows two screenshots from the Salesforce CRM interface. The left screenshot is a 'Lead Record' form with fields for Lead Owner (Pavel Jakovlev), Lead Record Type (End User), Lead Type (Potential Customer), First Name, Last Name, Company, Title, Development Partner, Lead Currency (U.S. Dollar), Next Action, Deadline (1/12/2016), Request Type, and Energy bill greater than \$2500?. A large blue arrow points from this form to the right screenshot. The right screenshot is a 'Lead Source' form with fields for 'How did you hear about Northern Power?' (empty), Lead Source (Other), and Detailed Lead Source (Wind Power Lease).

- ❖ All activities are tracked in 'Campaigns'
- ❖ One parent campaign with several sub-campaigns to specify whether activity is inbound or outbound
 - Wind Power Lease
 - Traditional
 - Web
 - CRM Database
- ❖ Each field marketing activity type is also logged

<input type="checkbox"/>	Edit Del	Wind Power Lease	1/12/2016	0	0		In Progress	✓
<input type="checkbox"/>	Edit Del	Wind Power Lease CRM Database	1/12/2016	475	0	Email	In Progress	✓
<input type="checkbox"/>	Edit Del	Wind Power Lease Traditional	1/12/2016	0	0		Evaluating	✓
<input type="checkbox"/>	Edit Del	Wind Power Lease Web	1/12/2016	0	0		In Progress	✓



Custom Wind Power Lease Quote

❖ On-site analysis:

- 12 months of utility bills collected per meter
- Property size and boundaries determined
- Turbine location considerations identified
- Soil examination for foundation estimate prior to BOP

❖ Desk analysis:

- Energy consumption analysis
- Electricity rate calculation
- Overlay data with NPS 100 output at sites' average wind speed

❖ Package the results

❖ 'Savings!' presentation to the potential customer

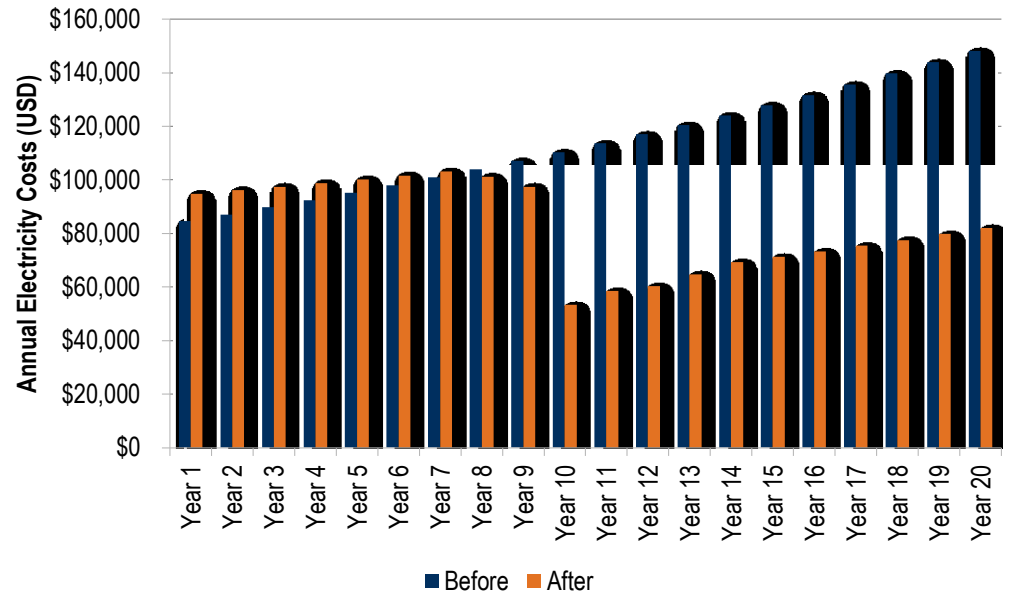


10-Year Finance Program

Assumptions:

Total Current Annual Load (kWh)	1,000,000
Number of Turbines:	2
Annual Energy Produced by Turbines (kWh)	496,000
Electricity Rate (\$/kWh)	0.13
Electricity Escelation Rate	3%
Lease Term (years)	7
Monthly Payment	\$6,605

Annual Electricity Costs



20-Year Savings:

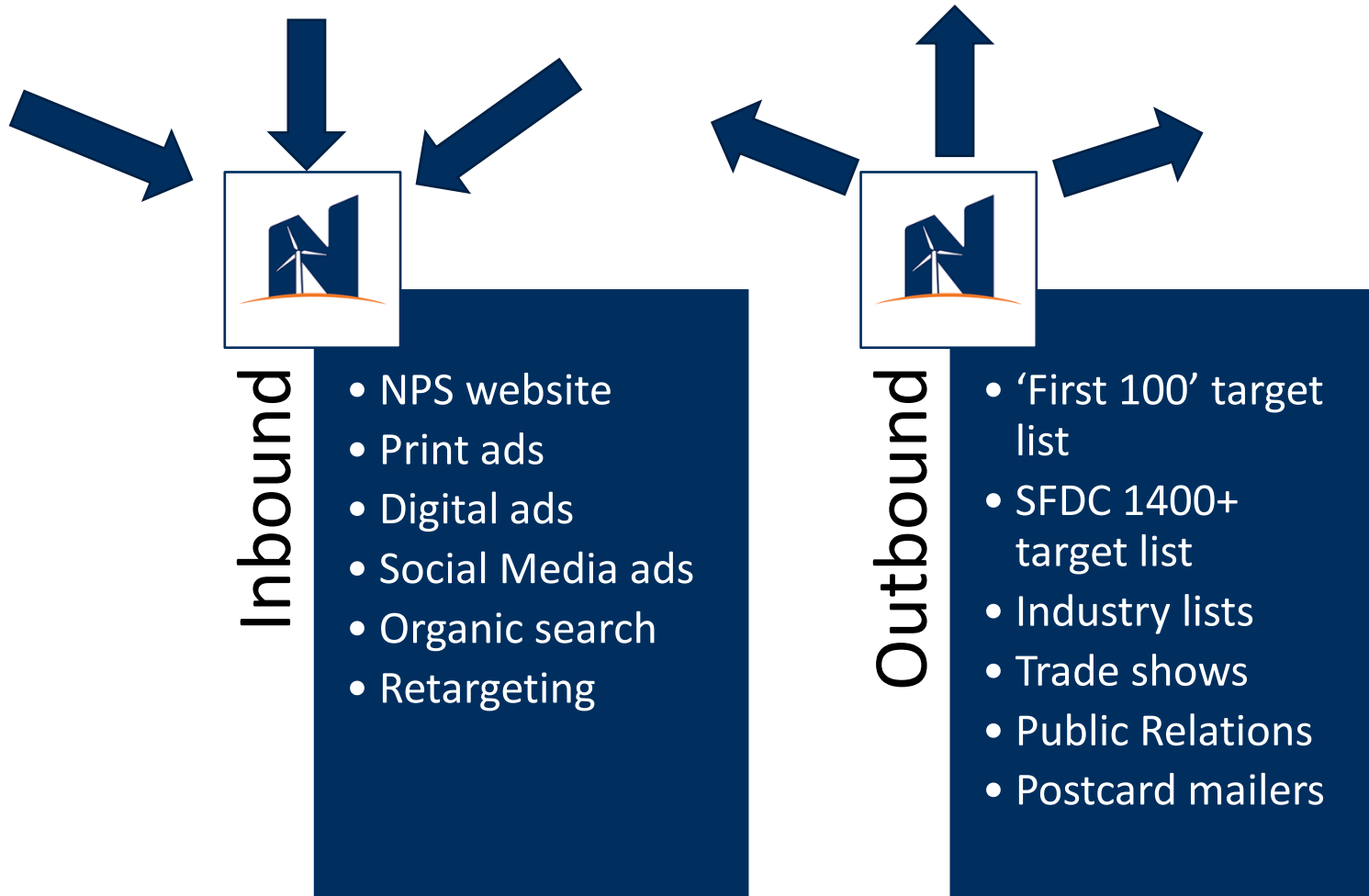
\$615,682

Upfront Cost:

\$0



Generate New Leads



Marketing:





Start Using Your Best Resource And Start Saving Money With Wind Power Today!

Dear Business Owner,

Northern Power Systems has introduced a way for you to **save money on your energy bills** due to:

- 1. Your estimated high cost of energy**
- 2. Your estimated monthly energy consumption**
- 3. High wind resource on your property**

If your current energy bill exceeds \$2,500 per month, we believe you can benefit from our lease-to-ownership offer; Wind Power Lease. This program enables business owners to take control of their energy costs, benefit from tax incentives, improve working capital and save hundreds of thousands of dollars.

Want to know more? I will follow up with you shortly to discuss our program in more detail and show you how **You Can Take Control of Your Energy Bills!**

Excited? For a free, no-hassle proposal outlining the savings available to you today, please call: 802-343-9241 or email: drussell@northernpower.com

Darrin Russell,
Manager of North American Sales

29 Pitman Road, Barre, VT 05641 USA
Tel: +1 877 906 6784



Wind Power Lease Brochure

Wind Power Lease™

Save Thousands of Dollars Every Year by Switching to Wind

Want more money for your farm or business rather than putting it into ever-increasing energy bills? Northern Power Systems is now offering a solution in the US for Farmers, Commercial and Manufacturing Businesses. Our Wind Power Lease enables business owners and other stakeholders to take control of their costs of electricity and benefit from additional disposable income, while supporting a sustainable future for generations to come.

Leasing is a simple, cost-effective way to finance machinery, cars and other assets for your business. The Wind Power Lease program provides the same simple solution to generate your own electricity while preserving money for your business month after month.

With **100% financing**, and payments spread over seven years, Wind Power Lease offers a clear line of sight to predictable, and overall lower, cost of energy.

Lease Program Highlights:

- ›› All-in: NPS 100™ Wind Turbine, 24/7 monitoring, service and maintenance
- ›› 100% financing
- ›› 100% tax-deductible
- ›› You can use all energy the turbine generates
- ›› You can own the NPS turbine after Year 7 at a substantially reduced price

Northern Power Systems is the leading manufacturer of 100kW distributed wind turbines in the United States, and has over 500 units installed globally. With Wind Power Lease, Northern Power Systems now provides a turnkey solution that includes operation and maintenance during the lease period—all available today, hassle-free, and with zero upfront cost.

For more info visit our website NorthernPower.com/Lease or call 802 343 9241.

Your Old Energy bill vs Your Future Savings



100% FINANCING



NPS Marketing Case Study

First Vermont Cow Power Farm Now Also Capturing Wind Energy

Blue Spruce Farm

Location
Bridport, VT
Project
Net metered 100 kW distributed wind generation system at a dairy farm
Model
NPS 100-24, 37 meter tower
Average wind speed
5.2 m/s (11.6 mph)
Annual Energy Production
176,000 kWh
Major Load center
Milking parlor, fans in the barn that circulate air and keep the cows comfortable
Annual Carbon Offset
132 tons

The first farm in Vermont to put Cow Power on the electric grid is now capturing energy from the wind. Blue Spruce Farm produces over 4 million gallons of top quality milk each year, which is used to make locally produced Cabot Cheese. The family crops 3,000 acres to feed their dairy cows. In 2006 they became the first farm in Vermont to turn cow manure into electricity with a methane digester, and they generate 2.5 million kilowatt hours of electricity annually for their community.

The Northern Power 100-24 was installed in March 2013, just one month after ground breaking. With the wind blowing off Lake Champlain, the location is ideal, and the NPS 100 is expected to generate 176,000 kWh power per year for the farm and the community. As part of the partnership with Green Mountain Power, Blue Spruce Farm will receive a portion of the power produced through net metering, making the NPS 100 turbine a good financial decision for both Blue Spruce Farm and GMP.

"The Audet family led the way with Cow Power, so it was logical for us to approach them when we were looking for a partner to host a community-scale wind turbine. As far as we know, Blue Spruce is the only farm in the US that's producing renewable electricity from cow power and from wind power."

- Mary Powell, President and CEO of Green Mountain Power, the local electric utility who owns the turbine

Case Study - APPLICATION: FARM



Sustainability: Today and Beyond

Blue Spruce Farm's two Cabot Cheese plants are owned by the Audet's and other local farm families, employing over 575 people, while providing a valuable market for Vermont milk and global distribution of international award-winning cheddar cheese. Blue Spruce Farm is proud of their heritage, commitment to community, and being an integral part of the Cabot Co-Op making the World's Best Cheddar.

The Wind Turbine for Blue Spruce Farm: NPS 100-24

The Audet family has been farming in Bridport since 1958. They are committed to practices that reduce costs, energy use and waste, with a focus on protecting the environment and improving the health and comfort of their cows. Harvesting the wind that blows across the fields for electricity fits naturally with what they do.

RELIABLE TECHNOLOGY The turbine's innovative low-maintenance, gearless design allows the Audet family to stay focused on what's important—their hard working girls (the cows of course!) The robust, reliable design coupled with Northern Power's fleet availability of over 98 percent, 24x7 monitoring and local service assured the Audet's that their turbine will continue to perform for many years to come.

THE "GREENING" OF BUSINESS Blue Spruce Farm values green business practices, and was the first farm in the state to install a Cow Power bio-digester, naturally processing all the waste from the farm and using the methane gas produced to power generators that push electricity into the grid. Adding the wind turbine to their environmentally friendly farm was a natural expansion of their business.

REDUCE CARBON FOOTPRINT Using wind power replaces fossil fuels and contributes positively to sustainability.

Good Stewards of the Land

Demonstrating the future of renewable energy is a big part of the secret to their success and the Audet family is always ready to try the next great thing. The family has a real sense of the environment and how to use technology to do a better job to make quality dairy products available to everyone.



NPS, Northern Power, Smartview & Hurricane Resistant are registered trademarks of Northern Power Systems.

Northern Power Systems
25 Plemton Road
Barré, Vermont, 05641 USA
877 90 NORTH
northernpower.com Northern
POWER SYSTEMS



Continue the Outreach- Shows, Open Houses, Etc.

Colorado

• Shows

- www.coloradofarmshow.com
26-28 Jan, 2016
- www.vailfarmersmarket.com 19
Jun-2 Oct, 2016

• Media Outlet

- [http://agriculture.einnews.com/
state/colorado](http://agriculture.einnews.com/state/colorado)
- www.thefencepost.com
- www.denverpost.com

• Trade Union

- www.rmfu.org

• Farming Association

- [http://ffa.cccs.edu/about-
colorado-ffa](http://ffa.cccs.edu/about-colorado-ffa)

Kansas

• Shows

- Wichita Farm & Ranch Show –
Park City, KS 8-10 Nov, 2016
[http://tradexpos.com/wichita-
farm-ranch-show](http://tradexpos.com/wichita-farm-ranch-show)

• Media Outlet

- www.kansasagland.com
- www.agweb.com/farmjournal
- [www.kshs.org/kansapedia/kans
as-department-of-
agriculture/12113](http://www.kshs.org/kansapedia/kansas-department-of-agriculture/12113)
- www.agjournalonline.com

• Trade Union

- [https://ksfarmersunion.wordpre
ss.com](https://ksfarmersunion.wordpress.com)

• Farming Association

- <http://www.kbfa.org>
- www.kfb.org

New York

• Shows

- NOFA NY Winter Gardening 22-
24 Jan, 2016 www.nofany.org
- WNY Farm Show 4-6 Feb, 2016
www.ecfair.org/wny-farm-show
- NY Farm Show 25-27 Feb, 2016
<http://newyorkfarmshow.com>
- Empire Farm Days 11-13 Aug,
2016 www.nofany.org

• Media Outlet

- www.farmingmagazine.com
- www.leepub.com
- [www.nebeginningfarmers.org/
resources/guides/farming-guide](http://www.nebeginningfarmers.org/resources/guides/farming-guide)

• Trade Union

- [http://www.newenglandfarme
rsunion.org/](http://www.newenglandfarmersunion.org/)

• Farming Association

- <http://nyfb.org>



NPS Marketing-to-Sales

- **Complete sales:**
 - Product Sales Agreements
 - Lease Contract

Handoff to Application Engineering



NPS Application Engineering, Cx

Upon handoff from sales:	
Submit interconnection application	X
Pull bldg. permit	X
Geo-tech soil analysis	X
Foundation design, stamped	X
Schedule Construction	X



NPS Sub-Contract, Oversee Construction

Designed for Easy Construction - Installation

- ❖ Cost optimization
- ❖ Fewer parts
- ❖ Moderate size
- ❖ Flexible equipment requirements
- ❖ 1 day erection & 1 day commission



Completion!

NPS 100 installations



NPS Warranty, Monitoring & O&M Service

Utility-Scale Fleet Management in 100 kw package

- Remote Monitoring
- Performance Trending
- Centralized Data Collection



**“End-to-End
Component-level
Diagnostics”**







Distributed Wind 2016



Making Distributed Wind Cost Competitive

Moderator

Charles Newcomb, Endurance Windpower

Speaker

Suzanne Tegen, National Renewable Energy Laboratory

Jason Kaplan, United Wind

Ryan Storke, CEC Energy

Paul Roamer, Ethos Distributed Solutions



Making Distributed Wind Cost Competitive

Suzanne Tegen, National Renewable Energy Laboratory



Distributed Wind 2016



Making Distributed Wind Cost Competitive

Distributed Wind 2016

February 23, 2016

Presentation Agenda

1. United Wind Introduction and History
2. Historic High Cost of Distributed Wind
3. Solutions to Make DW Cost Competitive
4. Q&A



United Wind Overview

United Wind: Established to Fulfill a Market Need

- United Wind Inc. was founded in early 2013 and is headquartered in Brooklyn, New York
- The founders observed a customer need for financing in the distributed wind sector
- Ideal customer: Ag, 5+ acres, 5 m/s, 10,000 kwh/year
- The company launched its first product, WindLease, in late 2013
- The company has created a scalable platform for site assessment, origination, financing, and installation
- To date the company has signed over 150 leases, arranged over \$200m of project finance capital for small wind projects, and has placed 26 projects in service

The WindLease™ Platform



The 4 components of the WindLease platform

Unique Customer Value Proposition

WindLease™ First to market with a discounted to utility, distributed wind energy lease

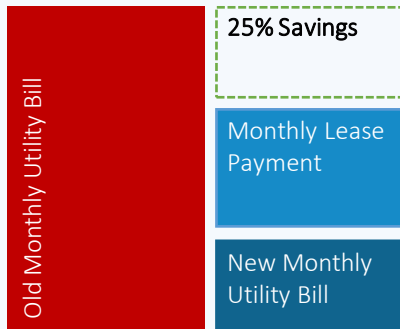
An Easy Switch to Wind

- Zero upfront costs
- Installation & maintenance included
- Monthly payments less than current utility bill
- 20 year warranty + performance guarantee

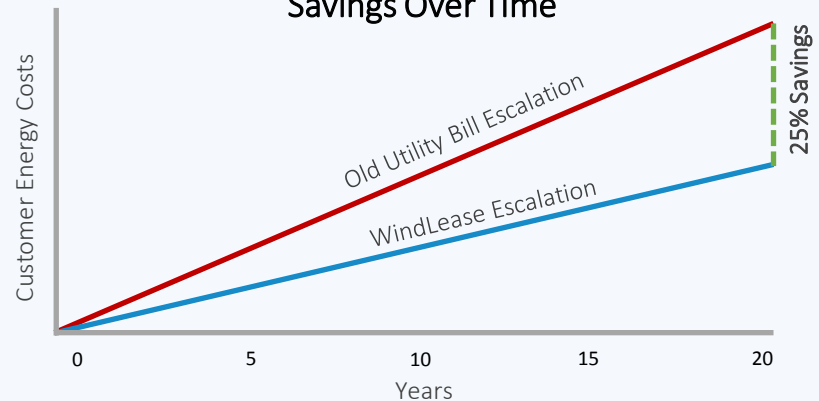
Meaningful Customer Savings

- 10% immediate discount on electricity
- Payment rates are locked in below utility escalation rates
- 25% savings typical over life of lease
- Typically powers 75% - 100% of property energy needs

Monthly Savings



Savings Over Time





Historic High Cost of Distributed Wind

High Cost of Distributed Wind

- Distributed Wind has been a Fragmented Market
 - One-Off Projects
 - Manufacturer and installer revenues reliant on isolated and infrequent projects
 - High Cost of Capital; Investors unfamiliar with asset class
 - Lack of efficiencies in construction and operation





Solutions to Make DW Cost Competitive

Inputs Effecting DW Cost Competitiveness

- Up front Capital Expenses
- Ongoing Operation and Maintenance
- Economic Useful Life
- Capacity Factor
- Cost of Capital



DW Becomes Cost Competitive Through Scale – Capital Expenses

- Issuing Purchase Orders for tens of turbines at once
- “Installation Campaigns”
- Analysis and cost segregation of construction materials and installation tasks
- Insourcing



External Mechanisms to Assist Capital Cost Reduction

- Cost Reduction through Utility, Municipal, and State Agency Programming
 - Utility includes insert with monthly bill offering customers savings through UW program, lowering customer acquisition costs.
 - Municipality develops Solarize-like program for DW, aggregating regional projects.
 - State Agency funds development of uniform small wind energy permit, streamlining land use and zoning process.



DW Becomes Cost Competitive Through Scale – Cost of Capital

- De-risking distributed wind through data and analytics; Comfort with production figures and O&M expenses
- Creditworthy customers
- Capital market competition
- Policy stability
- Exploring financing sources with lower cost; DOE Loan Guaranteed debt, NY Green Bank Construction Loan



Outcomes of Scale

- Reduce Capital Expenses through bulk ordering of material and services.
- Capitalized fixed costs of legal, accounting, independent engineer reports, and insurance over portfolio of projects, drives cost lower.
- Focusing installs in regions with higher capacity factor
- De-risking asset class and reducing cost of capital





Questions?



Distributed Wind 2016



Making Distributed Wind Cost Competitive

Ryan Storke, CEC Energy



Distributed Wind 2016

Making Distributed Wind Cost Competitive

Paul Roamer

Ethos Distributed Solutions

February 23, 2016



About Ethos



About Ethos

Ethos Distributed Solutions is a client focused, vertically integrated field services company delivering specialized construction & engineering, operations & maintenance, asset management, and consulting services to wind, solar and wireless telecommunications market participants.

Our team of experienced professionals customize high-quality and cost-effective solutions to address each client's specific requirements across the entire life cycle of a capital asset – development, construction, operations and decommissioning.

**Operations & Maintenance /
Field Services**

**Construction &
Engineering**



**Asset
Management**

Consulting

A Sustainable & Scalable Field Services Solution

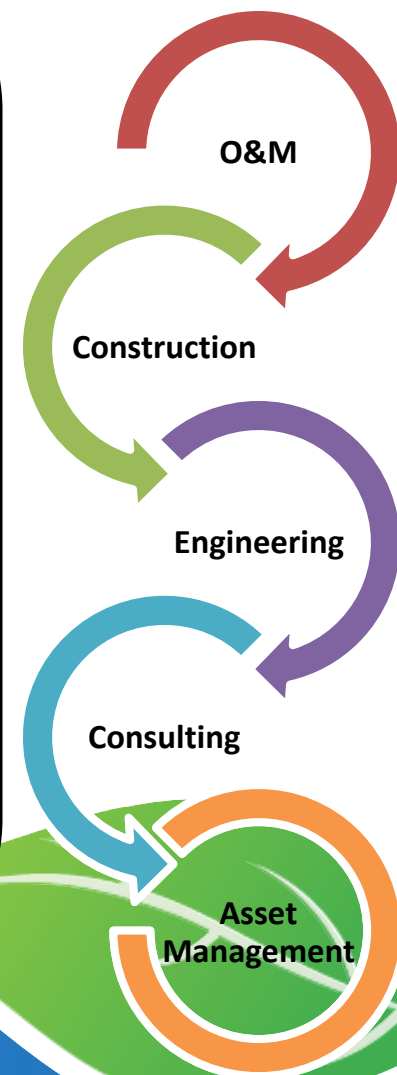


Ethos Distributed Solutions is a client focused, vertically integrated field services company based in Denver, CO. Our team of experienced professionals customize high-quality and cost-effective solutions for clients across the U.S. utilizing:

- **FIVE** specialized service capabilities
 - (O&M, construction, engineering, consulting, and asset management) to address specific requirements primarily for
- **FOUR** key client profiles
 - (asset owners, OEMs, asset managers and other third parties, such as developers, EPCs and consultants) within
- **THREE** markets
 - (wind, solar and wireless telecommunications).

We offer our clients flexibility through

- **TWO** engagement types (on-going or project based), and always having
- **ONE GOAL** in mind: customer satisfaction.



Current Client & Regional Coverage

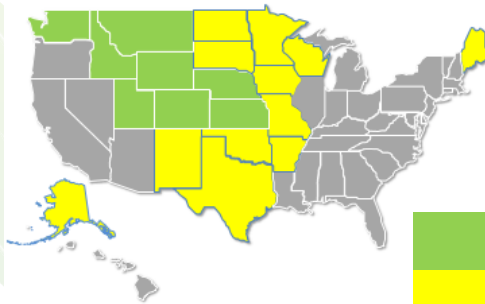


EthosDistributed
Solutions

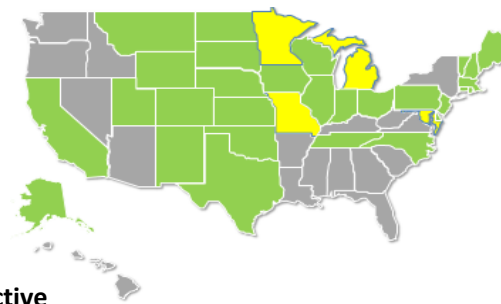
Ethos Distributed Solutions fulfills the specific needs of a variety of client profiles by providing customized services throughout several states in the U.S.

- Asset owners
- OEMs
- Asset managers
- Other third parties, such as developers, EPCs and consultants

Current Telecom
Coverage



Current Wind & Solar
Coverage



About Ethos Renewables



Ethos is the U.S. industry leader in the service and repair of distributed renewable energy systems. Trained and skilled in more than 17 different manufacturer models, we maintain over 300 renewable energy systems nationwide.

- Wind turbines ranging from 3.7 kW to 2.5 MW
- Wind projects from 50 kW to 300 MW
- Solar projects from 3 kW to 5.0 MW
- Wind and Solar PV installs in five states
- Mix of traveling technicians and full time site employees

Market & Cost

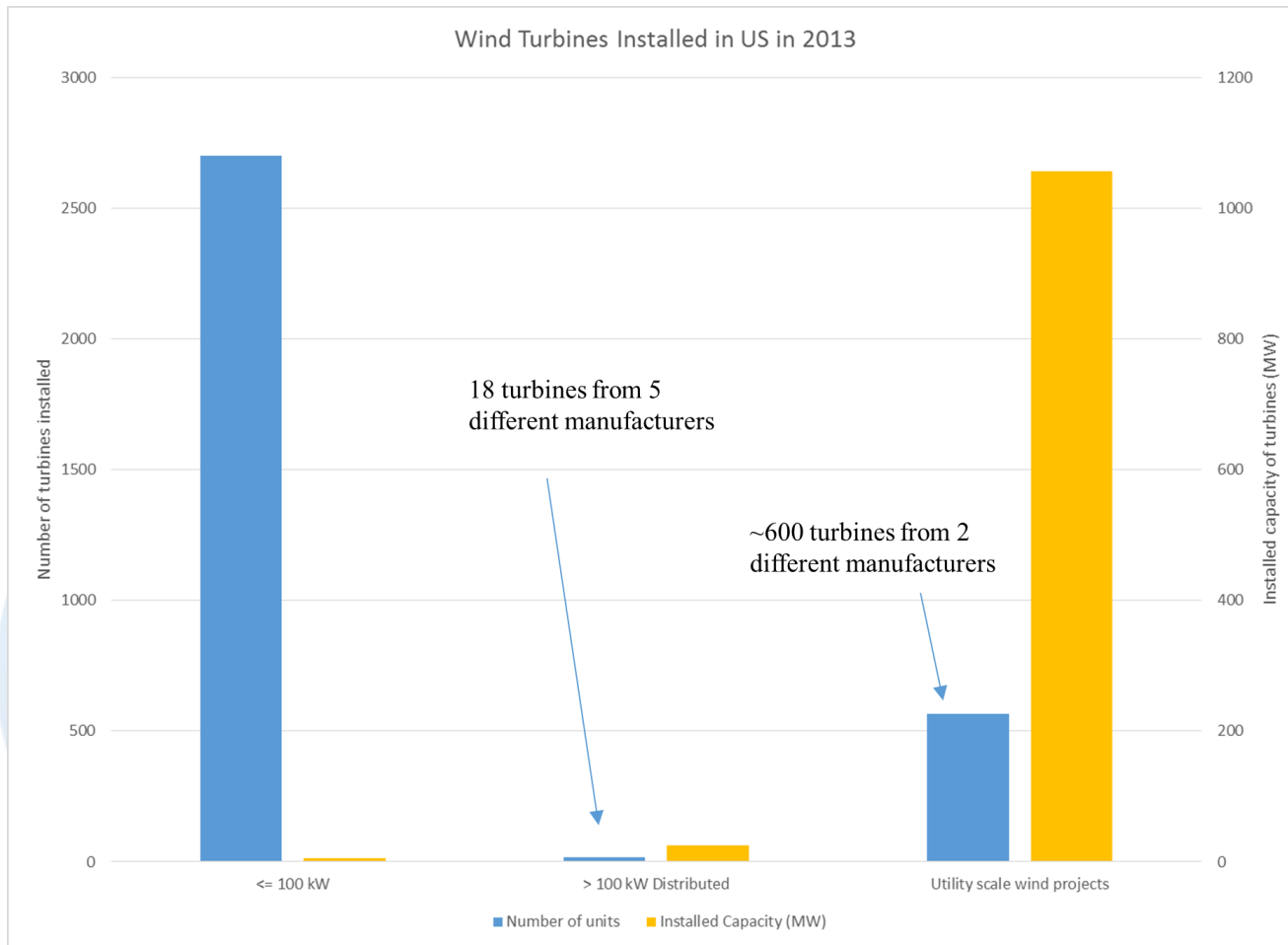


Confidential and Proprietary

O&M Plan for Distributed Projects

- O&M Plan **MUST** be considered early in a project
 - Develop long term operations strategy before project development is complete
 - Equipment Selection -> Construction QA -> Commissioning -> Warranty Period O&M -> End of Warranty Inspection -> Post-warranty Operations & Maintenance
 - Ongoing performance monitoring & improvement

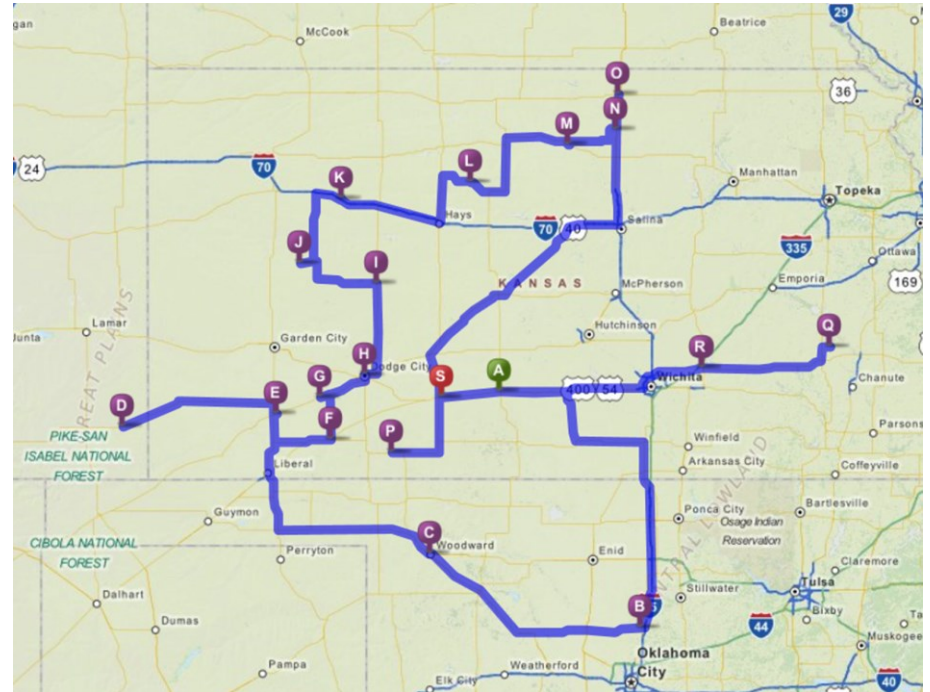
Wind Market Segmentation



Source: DOE EERE 2013 Distributed Wind Market Report & DOE EERE 2013 Wind Technologies Market Report

Impact of Scale

- Expertise increases with increasing installed base and common turbine types
- Rates have come down with increased clustering and reduced travel time
- Maintenance schedules have become more streamlined with increased installed base



Results

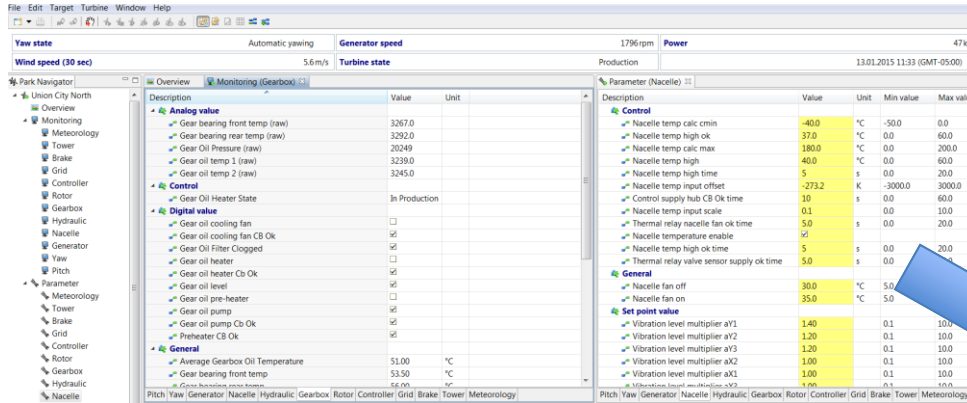


Confidential and Proprietary

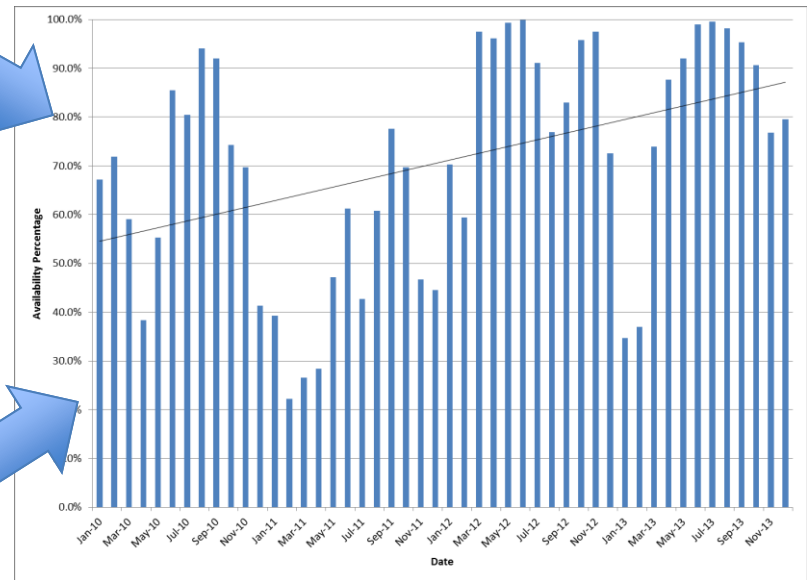
Interaction of Services

- Scheduled Preventative Maintenance
- Minor Correctives
- Major Correctives
- Detailed Engineering Troubleshooting
 - Existing manufacturer vs manufacturer gone
- Monitoring
- Reporting

Resets vs Repairs



Fault	Fault Name	# Times Recorded	Auto Reset?	Notes
1.1	Watchdog	126	No	Software issue
3.6	Brake pad 1 worn	45	No	Brake adjustment issue
3.7	Brake pad 2 work	34	No	Brake adjustment issue
3.11	Rotor brake failed to release	2	No	Associated with low hydraulic fluid faults
4.4	Yaw direction error	3	No	
4.5	Yaw error outside limits	1	No	
4.26	Encoder zero cable mismatch	7	No	
5.13	Voltage asymmetry	30	Yes	Grid event
5.19	GPU comm error Modbus	3	No	Grid event
7.2	Rotor overspeed, software	15	No	
9.5	Hyd. Motor max run time	4	No	Low fluid, low temp.
9.6	Hyd. Yaw brake pressure low	14	No	Low fluid, low temp.
9.8	Hyd. rotor brake pressure low	21	No	Low fluid, low temp.
9.9	Hyd. tip brake pressure low	8	No	Low fluid, low temp.
10.14	Gear oil pressure low	8	No	Gear oil pump startup issues
10.15	Gear oil pressure high	11	No	Low temperature issues
11.2	Vibration X Level 1	11	No	
11.3	Vibration Y Level 1	97	No	
11.5	Nacelle Shock Vibration	20	No	
11.7	Vibration Y Level 2	6	No	
11.8	Vibration X Level 3	1	No	



Root Cause & Corrective Action



Contact



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President

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Making Distributed Wind Cost Competitive

Moderator

Charles Newcomb, Endurance Windpower

Speaker

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Paul Roamer, Ethos Distributed Solutions



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Export Opportunities

Moderator

Mark Riedy, Kilpatrick Townsend & Stockton LLP

Speaker

Craig O'Connor, US Export Import Bank

Drew Bennett, USAID-Power Africa



Distributed Wind 2016



Financing Wind Energy Exports: The Role of Ex-Im Bank

**Craig O'Connor, Director
Office of Renewable Energy &
Environmental Exports**



Distributed Wind 2016

U.S. Ex-Im Bank

- ▶ Independent agency of the U.S. government established in 1934 to finance the export sales of U.S.-made goods and services
 - ▶ Provides Loan Guarantees, Export Credit Insurance, Working Capital Guarantees, and Direct Loans.
 - ▶ Created its Renewable Energy Business Development Initiative 2009
- * From \$30MM in 2008, to \$100MM in 2009, to \$330MM in FY2010, the Bank has authorized over \$2.0 billion in support of renewable energy exports since 2009!*

▶ Ex-Im Bank Renewable Energy Program enhancements:

- Terms of up to 18-years
- Up to 30% local cost support within the U.S. scope of supply.
- Capitalization of interest during construction

▶ Ex-Im Bank financing is usually the most cost-effective source of financing for international customers to purchase U.S.-made technology

Current 18-year fixed interest Direct Loan rate = 3.29% (as of Feb. 15, 2016)

Current 12-year fixed interest Direct Loan rate = 2.85% (as of Feb. 15, 2016)

▶ Have approved foreign buyer financing for customers of Bergey Windpower, Northern Power, and Southwest Windpower in recent years.

Direct Loan

- Direct Loans made by Ex-Im Bank to a foreign buyer
- Fixed interest rates based on a 1% spread over Treasury notes
- The international borrower submits the Direct Loan application.
- Ex-Im Bank requires the buyer to make a cash payment to the exporter equal to at least 15% of the U.S. supply contract.
 - 15% cash payment can either be borrowed from a lender or the exporter, or be from the buyer's own funds.
- Exporter paid with disbursement L/C or buyer is reimbursed
- A negotiated credit agreement required for a Direct Loan
- Shipping must be made on U.S.-flag vessel (except air shipments)

Loan Guarantee

Guaranteed Loans made by commercial banks (U.S. or foreign) to a foreign buyer with a 100% *unconditional* repayment guarantee from Ex-Im Bank

- **Guarantee covers 85% of the U.S. content of the transaction.**
- ***Negotiated* interest rates, often floating rates based on spread over 6-month U.S. dollar LIBOR rate; banks can also arrange fixed interest rates**
- **Loan fully transferable, can be securitized**
- **Banks often finance the 15% required cash payment**
- **Guarantee available in major foreign currencies**

Northern Power – Italy Community Wind

- ▶ Ex-Im Bank provided a 15-year Loan Guarantee in Euros worth U.S. \$6.4 million to Raiffeisen Bank (RBI International Finance) to finance the export of 15 Northern Power™ 100 kilowatt permanent magnet direct drive wind turbines to community wind projects in Italy.
- ▶ *ARG Energie S.R.L.* of Avelino, Italy is the borrower on the transaction with PurEnergy, a leading wind energy developer based in Bisaccia, Italy, providing the installation, operation, and maintenance of the turbines.
- ▶ This transaction represents the largest-ever U.S. export of small wind turbines!
- ▶ This transaction, processed under the Bank's Renewable Energy Express Program, marks the first time Ex-Im Bank has financed a community wind power project supported on a project finance basis.
- ▶ The Italian Government has created an incentive program to promote the expansion of grid-connected small wind power projects under 200 kilowatts.
- ▶ Energy produced by the small wind projects is eligible for an attractive feed-in-tariff price that is fixed for 15 years.

Northern Power – Italy Community Wind



Export Credit Insurance

- ▶ Enables U.S. exporters to offer short- and medium-term *credit directly to their customers*, or for banks to insure credit lines and L/Cs.
- ▶ Export credit is an attractive substitute to cash-in-advance, letters of credit and costly local bank financing.
- ▶ Insures up to 180 days from date of importation of the goods; capital goods terms of 360 days-7+ years.

Ex-Im Bank offers both Multi-buyer and Single-Buyer Insurance

Process:

1. The U.S. supplier submits the application along with the required information to establish a credit limit for the foreign customer.
2. Information requirements for the foreign buyer credit limits:
 - ▶ \$10,000 credit - a favorable trade or bank reference.
 - ▶ \$10,000-\$50,000 credit - a current credit report
 - ▶ \$100,000-\$300,000 credit a current credit report + favorable bank or trade reference.
3. Ex-Im Bank's Loan Officer analyzes the application and makes a decision on the amount of credit to be supported.

Case Study: *Windstream Technologies*

- ▶ *Windstream Technologies, Inc.*, exports wind turbines to distributors and customers worldwide.
- ▶ Ex-Im Bank's Short-Term Credit Insurance enables *Windstream* to offer "open account" credit terms to its distributors that enables them to place larger orders.
- ▶ Credit terms can range up 360-days open account; longer terms from 2-18 years also available under Ex-Im Bank's Long-term programs.
- ▶ Replaces bank financing and payment by L/Cs, enables customers to offer credit to their customers.
- ▶ Financing is often THE critical factor in financing export sales, open account credit has advantages for international buyers:
 - "Supplier credit" attractive substitute to buyer using L/Cs
 - Interest rates high in many international markets
 - Increase order quantities to existing customers/distributors



Working Capital Guarantee

- ▶ Ex-Im Bank provides 90% repayment Guarantee for working capital loans, revolving or transaction based, made by commercial lenders to small businesses to finance export sales.
- ▶ The Working Capital Guarantee serves as the collateral to the commercial lender by mitigating the risk inherent when the source of repayment for the loan is an overseas contract.
- ▶ Enables exporters to finance materials, labor, and overhead to produce goods/services for export.
- ▶ Enables exporters to cover standby letters of credit for bid and performance bonds, or payment guarantees.
- ▶ Enables the exporters to finance foreign sales receivables.
- ▶ Most Working Capital Guarantees provided by Delegated Authority Lenders (see www.exim.gov for a list) without prior Ex-Im Bank approval.
- ▶ Southwest Windpower, Northern Power, and others has used this program.

Conclusion

- ▶ **Ex-Im Bank: top priority to support renewable energy & environmental exports**
- ▶ **Ex-Im Bank supports short, medium, and long-term financing to creditworthy international customers, and working capital guarantees to U.S. exporters**
- ▶ **Ex-Im Bank often plays a critical early-stage role in helping small clean tech companies finance their operations.**
- ▶ **With Ex-Im Bank's early-stage intervention these companies can grow their international business, increase profitability, and ultimately attract significant equity investment.**
- ▶ **Ex-Im Bank is interested in any size project**
- ▶ **We will work with you to create “bankable” projects**
- ▶ **We welcome your projects and your ideas!**

craig.oconnor@exim.gov

[Internet_http://www.exim.gov](http://www.exim.gov)



Distributed Wind 2016



U.S. Government Resources for Renewable Energy Exporters: Power Africa and Beyond

Distributed Wind 2016: Export Opportunities

Drew Bennett

Power Africa – Investment Mobilization Group

<https://www.usaid.gov/powerafrica>

anbennett@usaid.gov

Exports: Powering the Future of the U.S. Wind Industry



- ✓ International market growth + U.S. competitiveness = opportunity
- ✓ USG resources for exporters
- ✓ Spotlight on Power Africa

Top Markets for Wind Exports



- China + Canada + Mexico + Brazil = 70% of U.S. wind export through 2020.
- Other key markets: India, United Kingdom, Turkey, South Africa.
- Unique regional opportunities: Central America & the Caribbean, Scandinavia and Northern Europe, Asia Pacific.

Renewable Energy Top Markets Report

Wind Energy

Most U.S. wind energy exports currently are destined for only a small group of markets – namely China, Canada, Mexico, and Brazil. These four markets alone will account for over 70 percent of all wind exports through 2016. Yet, continued global investment in the industry outside traditional markets will very likely increase going forward, broadening export opportunities for U.S.-based suppliers. In fact, through 2020, ITA expects the wind sector to overtake solar as the leading renewable energy exporter, accounting for nearly one-third of all exports in the sector.

The wind industry is a large and growing sector with a supply chain that produces thousands of component parts as well as a service sector that is increasingly advanced in its use of technology to design turbines, organize wind farms, and map wind potential. Most of the industry is vertically integrated, but deep supply chains have emerged to provide technology and components to the largest turbine manufacturers.

Importantly, policy uncertainty in the United States has begun to encourage U.S. wind component manufacturers to look abroad for export opportunities. Coupled with a near doubling of wind energy capacity installed outside the United States through 2020, this dynamic should allow the wind sector to surpass solar as the leading renewable energy export industry. Despite ongoing logistical challenges and higher labor costs, ITA expects the market share captured by U.S. exporters to increase in the near-term, rising to around eight percent, as products traditionally used to supply local demand are shipped to international buyers instead.

Overview of Global Export Market Opportunities

The global wind market is in the midst of a recovery after a brief decline in 2013. Orders for nearly all manufacturers have increased year-over-year and turbine prices have stabilized around the world.

According to industry projections, demand should further increase in 2015 before stabilizing slightly in 2016 and beyond. Most demand will be met with locally-sourced products, as the wind industry's preferred method of global expansion has been foreign direct investment. Last year's *Top Markets Report* noted the ongoing shift of the wind energy market towards Asia and other emerging markets and away from traditional European countries.

ITA anticipates this trend to continue to 2016 and accelerate thereafter. China, in particular, will be the focal point of the industry going forward, installing

roughly 27 GW of new capacity between now and the end of 2016. Other key markets will include India, Brazil, Canada, the United Kingdom, Mexico, and Turkey.

The largest four export destinations – China, Canada, Mexico, and Brazil – should account for the majority of all U.S. exports in the sector through 2020, as export markets are expected to remain highly concentrated. One market that should support a surprising number of U.S. exports, however, is Egypt, which jumped to #5 on ITA's list of near-term wind export markets – up from #19 in last year's report. With no domestic production capability, Egypt's planned capacity additions will need to be sourced from elsewhere and U.S. exporters, while not dominant in the market, should find opportunities to export competitively. In fact, ITA projects that U.S. exporters will capture roughly one-fourth of all Egyptian

Figure 1: Near-Term Wind Export Markets (2015-2016)

1. **Canada**
(large market; large share)
2. **China**
(large market; small share)
3. **Brazil**
(large market; small share)
4. **Mexico**
(large market; large share)
5. **Egypt**
(small market; large share)
6. **Uruguay**
(small market; small share)
7. **South Africa**
(large market; small share)
8. **Honduras**
(large market; small share)
9. **South Korea**
(small market; small share)
10. **Philippines**
(small market; small share)

Government Resources for Exporters



- The Renewable Energy and Energy Efficiency Export Initiative
- U.S. Commercial Service Global Energy Team
- Department of Commerce Trade Promotion Programs

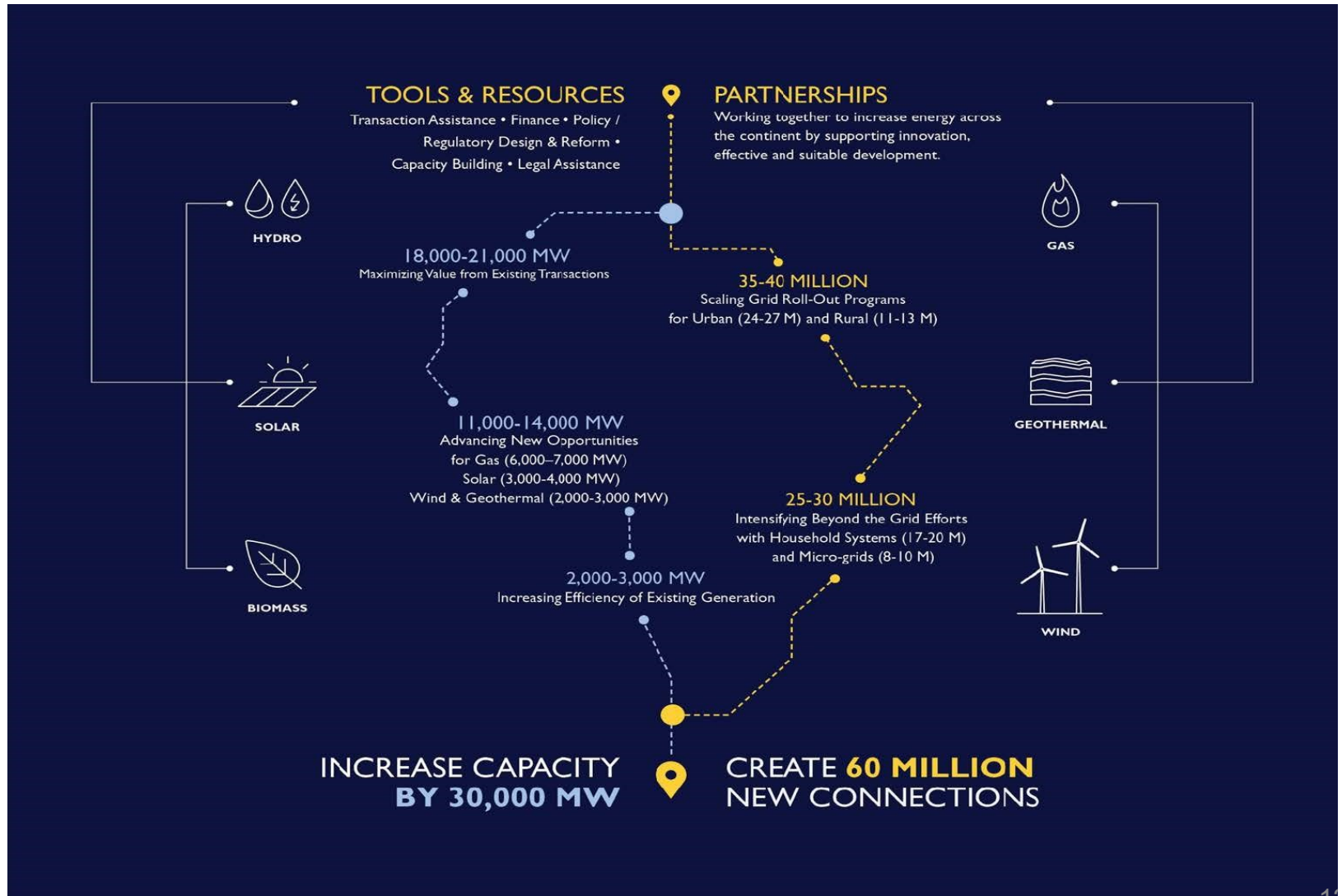
About Export.gov/REEE

The Renewable Energy & Energy Efficiency Exporter Portal is managed by the [International Trade Administration](#) in collaboration with:

	Commerce		OPIC
	Energy		USTDA
	Ex-Im Bank		STATE
	Agriculture		USTR
	SBA		

NATIONAL EXPORT INITIATIVE
NEXT 

Spotlight on Power Africa



Power Africa Toolbox



POWER AFRICA TOOLBOX

Tools & Resources to Unlock the Power of Sub-Saharan Africa



The Power Africa Toolbox provides a quick yet comprehensive view of the tools & resources Power Africa uses to drive deals & facilitate investment. These tools fall into five major categories:



Transaction Assistance

- Early-stage support for innovative energy solutions, resource evaluations, feasibility and grid impact studies, social and environmental impact studies, project appraisal and costing, engineering designs, public private partnerships, and other project preparation activities
- Late-stage expert technical, regulatory, and financial assistance to host country governments to advance power transactions to financial close and beyond

Who is it for?

Project developers, investors, host-country governments, entrepreneurs, African-owned and operated enterprises



Finance

- Equity, mezzanine financing, senior and sub-senior loans, guarantees, export credits, grants, and insurance programs

Who is it for?

Project developers, financing institutions, entrepreneurs, host-country governments, U.S. lenders and exporters



Policy/Regulatory Design & Reform

- Technical assistance to improve the enabling environment for private sector investment in the power sector through policy, legal, regulatory and utility reforms, improved procurement practices and power sector planning, and the adoption of financial incentives and risk mitigation schemes

Who is it for?

Host-country governments, utilities, regulators, and other stakeholders



Capacity Building

- Technical assistance to support institutional strengthening, technical and regulatory skill development, and project development and management activities
- Trade missions to the U.S. and to sub-Saharan Africa

Who is it for?

Host country governments, utilities, energy regulators, public procurement agencies



Legal Assistance

- Legal assistance to strengthen host country government expertise and negotiating capacity in structuring, financing and closing power transactions

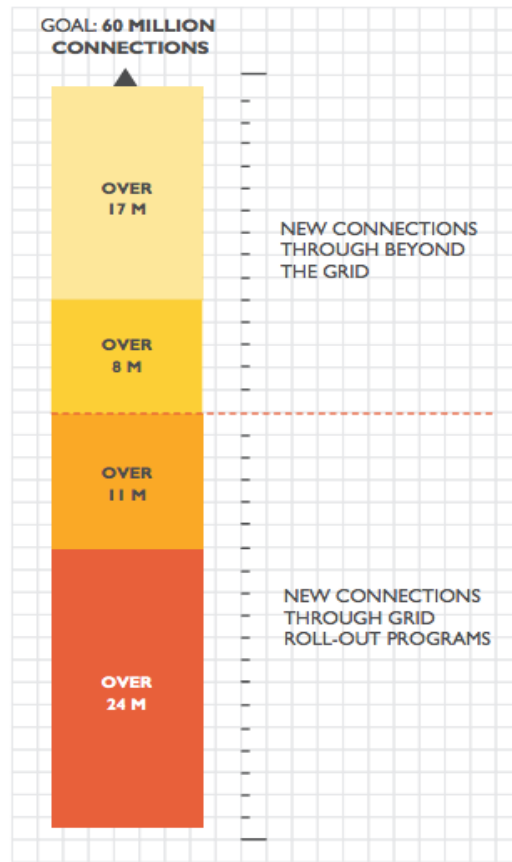
Who is it for?

Host-country governments and African utilities

www.usaid.gov/powerafrica/toolbox

Connections, million

- Households Connected to Micro-Grids
- Off-Grid Home Power Systems
- Urban Households Connected to the Grid
- Rural Connections to the Grid



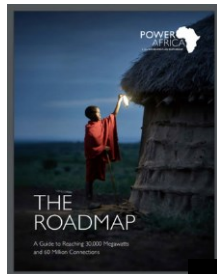
The Roadmap Pillar II: Generation AND DELIVERY

To double the number of connections, we will:

- Expand efforts to support large-scale urban and rural grid-roll out programs
- Intensify efforts in off-grid and small-scale solutions

Source: *Beyond the Grid* strategy and team analysis based on International Energy Agency, World Bank, and geospatial data

POWER AFRICA



Download the Power Africa Roadmap

Download the Power Africa Transaction Tracker



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Distributed Wind 2016



International Case Study – How To Structure And Finance An International Distributed Wind Project

**Panel: Export Opportunities
Distributed Wind 2016
February 23, 2016
JW Marriott, Washington, DC**

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- *Has Represented Clients In Renewable And Conventional Energy (Fuels And Power And Infrastructure) Project Finance Since 1975, Government Funding Initiatives (Grants, Loans, Loan Guarantees, etc.) Since 1980, And Clean Tech Private Placements Since 1999, Domestically And Internationally.*
- *A Founder And Original General Counsel:*
 - *Renewable Fuel Association –1979-1984.*
 - *Clean Fuels Development Coalition – Since 1985.*
 - *Clean Fuels Foundation – Since 1990.*
 - *American Council On Renewable Energy/Biomass Coordinating Council – Since 2001.*
 - *Latin American Council On Renewable Energy – Since 2009.*
- *Member of the Finance Committee of the Alliance to Save Energy (2015 to present).*
- *Assisted Clients In The Creation Of The Original Alternate Energy Tax Incentives In The 1978 And 1980 Tax Acts, And Their Expansions And Extensions Thereafter.*
- *Assisted Clients In The Renewable Fuels And Renewable Power Industries In The Development Of Provisions In The 1978 Public Utility Regulatory Policies Act, 1983 Caribbean Basin Economic Recovery Act, 1990 Clean Air Amendments (And Reformulated Gasoline Regulations Thereto), 1992 Energy Policy Act, 2005 Energy Policy Act, And The 2007 Energy Independence And Security Act, 2008 and 2014 Food, Conservation And Energy Acts, And 2009 American Recovery And Reinvestment Act.*
- *Named One Of The Top 100 Bioenergy Leaders Worldwide – BiofuelsDigest – 2011-2012 (#67), 2012-2013 (#50), 2013-2014 (#56), 2014-2015 (#49) and 2015-2016 (#42).*
- *AV Preeminent Rating By Martindale-Hubbell For Last 20 Years.*
- *Named One Of Washington, DC & Baltimore’s Top Rated Lawyers For Business & Commercial By Legal Leaders and Wall Street Journal For 2012-2016.*
- *Vice Chairman For Project Finance, American Bar Association, Section For Energy & Natural Resources Since 2010.*
- *Kilpatrick Townsend Ranked #1 Worldwide For Infrastructure Construction – Chambers – 2011-2015 and #1 in the U.S. in Intellectual Property – Chambers – 2011-2015.*
- *Graduated With JD – Georgetown University Law Center And BA – University of Michigan – Summa Cum Laude And Phi Beta Kappa.*

Case Studies – Companies Funding Projects in the US Versus Internationally

A. International Case Study—How To Structure And Finance An International Bioeconomy Project—Not For The Neophyte Or Faint-Hearted

1. Why invest in offshore distributed wind projects?
 - US regulatory uncertainty.
 - Perceived better returns.
 - Significant pipelines of project opportunities, among other important factors attract US developers to build their projects overseas.
2. Pick the country in which to build based on various factors including, but not limited to:
 - Stability, needs, political will, ability to financially close, etc.
 - This analysis entails four big questions:
 - Do they speak English?—the ugly American Syndrome – but language barriers can be daunting and costly.
 - Do they have a mature Financial System?
 - Do they have a mature Legal System?
 - Can you get your money out?
 - 4 Significant Wind Energy Venues:
 - Australia
 - Brazil
 - Canada
 - China
 - Denmark
 - Europe (Germany, France, Spain, United Kingdom, Italy, Portugal)
 - India

Case Studies – Companies Funding Projects in the US Versus Internationally

3. Critical Tax and Corporate Structuring—the developer “Cowboy Syndrome”—i.e. looking for the finish line while forgetting that inadequate structuring later can economically disable a project.
 - Tax structuring:
 - International Double Tax Avoidance Agreements (“DTAAs”)—Tax Treaties—to reduce host country taxes. Host countries can have excessively high direct and indirect taxes and can be tax aggressors. You seek to limit:
 - Corporate Income Tax and Capital Gains Tax on Investors.
 - Interest Income Tax on Lenders.
 - Royalty Tax on Licensors.
 - Corporate Structuring:
 - Limited liability protection to stop aggressive host countries from imposing excessive tax and non-tax project liabilities.
 - Tiers of limited liability projection, each of which can block tax and non-tax aggressor host country liabilities.
 - Tier 1 – Host Country.
 - Tier 2 – DTAA Country.
 - Tier 3 – Bahamas, Bermuda, British Virgin Islands or Cayman Islands (no taxes and no bilateral tax treaties, but strong limited liability protection).
 - Tier 4 – US – Delaware LLC, Nevada LLC, etc.
 - Bilateral Investments Treaties (“BITs”)—provide additional necessary investor rights – such as more favorable arbitration rights.

Case Studies – Companies Funding Projects in the US Versus Internationally

3. Critical Tax and Corporate Structuring—the developer “Cowboy Syndrome”—i.e. looking for the finish line while forgetting that inadequate structuring later can economically disable a project. (cont’d)
 - Examples:
 - Mauritius – 36 plus DTAAAs for Asia and Africa, substantial number of BITs, LLCs to limit investor liability from general tax and non-tax liability from aggressive host countries. Mauritian DTAAAs frequently limit host country corporate income tax on equity investors to 5% and their capital gains tax to 0%. LLCs in Mauritius are non-operating company “shells” simply to move investment money through. Debt, however, can be structured through Cyprus which reduces such host country tax to 10%, as Mauritius does not reduce interest income tax.
 - Singapore’s DTAAAs can be useful for equity investors and lenders of debt, but they generally require an operating company to demonstrate it incurred a minimum of 200,000 Singapore Dollars of expenses in each preceding year to use its DTAAAs in the current year.

Case Studies – Companies Funding Projects in the US Versus Internationally

4. Debt Finance and Insurance

- Generally, no export credit agency (“ECAs”), international funding agency or multilateral development banks (“MDBs”) will accept technology risk. Incubate your first commercial project in the US and then venture abroad with a second commercial. That said, BNDES (Brazil) and the China Export-Import Bank are the exceptions, as they will loan to particularly 1st commercial projects without a credit enhancement.
- Prominent International Funding Authorities and ECAs – some examples are:
 - **US Trade Development Agency (U.S. Funding Agency)** – provides grant based feasibility studies to determine a country’s/project’s feasibility.
 - **US Export-Import Bank (“Ex-Im Bank”) (ECA)**
 - Finances projects in both developing and developed countries—atypical of the majority of ECAs which generally finance only projects in developing countries.
 - Finances up to 85% of US content and up to 30% of foreign content. Thus, equity slices may be reduced at the Ex-Im Bank.
 - Loans are low cost and long term—near Treasury rates—typical base rates: Effective February 15 through March 14, 2016, 10 year fixed loan at approx. 3.04% and 18 year fixed loan at approx. 3.44%, each plus an exposure rate (dependent on the host country), and rates are recalibrated monthly but fixed at financial closing.
 - Loans and loan guarantees. No equity available.
 - Project, corporate and equipment finance.
 - **US Overseas Private Investment Corporation (“OPIC”) (U.S. Funding Agency)**
 - Finances projects in developing, emerging (like Israel and Turkey) but not developed countries.
 - Where US content is unavailable – OPIC requires that 25% of the project equity be from US investors.
 - Low cost and long term financing – generally approx. 600 basis points over LIBOR and 15 year terms are available.
 - Loans and Loan Guarantees. No project equity.
 - Various insurance policies are available. Political Risk – for expropriation, etc; arbitration award protection when host country courts do not act; feed-in tariff reduction; etc.
 - Loan Guarantees securing loans used in international equity funds to increase the available funds.

Case Studies – Companies Funding Projects in the US Versus Internationally

- **MDBs** – Five (5) World Bank private sector finance arms:
 - International Finance Agency (“IFC”).
 - European Bank for Reconstruction and Development (“EBRD”).
 - Asian Development Bank.
 - African Development Bank.
 - Inter-American Development Bank (“IADB”).

MDBs typically:

- Finance in developing countries only, and not in developed countries.
- Generally provide loans, loan guarantees and project equity (sometimes corporate, VC and private equity). Financing can be low cost and long term.
- Typical loans have tenors of 7 to 12 years and interest rates of 450 basis points over LIBOR, while typical loan guarantees are for periods of up to 15 years.
- Multilateral Investment Guarantee Agency (MIGA) provides insurance similar to OPIC.

5. International Green Banks/Green Bond Issuances.

6. Equity:

- Private Equity.
- Infrastructure Funds.
- Strategic Equity.
- MDB Equity—as described above, where available.

Case Studies – Companies Funding Projects in the US Versus Internationally

7. Challenges in Financing International Projects:

- Lack of familiarity by foreign parties with U.S. investor expectations.
- Foreign partners often require more funds from U.S. investors without wanting to provide additional ownership interest.
- Once invested into a country, it can be very difficult to extricate oneself and leave with one's funds. (Liquidation of Joint Venture companies involves long court proceedings in India.)
- Litigation of disputes can take 10 years plus. (I have insurance claims, tax and contract dispute actions now in 21st year in India).
- Foreign arbitration awards may not be enforced in host country courts. (This situation is why you need OPIC/MIGA insurance.)
- Corruption is often rampant. FCPA, OECD and UK Bribery Act Compliance are critical considerations.
- Excessive permitting often occurs at the Central, State, Provincial and local levels (Dabhol India Power Project example – nearly 900 permits and other government authorizations required to effect, at least, large financial closings).
- Aggressive tax regimes can reach beyond the host country to assert tax jurisdiction over an investor's worldwide income. One similar example is India's Vodafone case, where Vodafone Europe acquired Hutchinson Wampoa's (Asia) Cayman's subsidiary only to be taxed \$2 billion by the Government of India. India claimed that because Hutchinson had an Indian Subsidiary (which was not part of the transaction), then India could assert a capital gains tax on the unrelated transaction.
- Corporate laws in foreign countries may require a super (75%), and not simple (51%) to gain complete control – for example – to block a shareholder special resolution that could completely change the focus of a company's business.
- Protection of Intellectual Property from “reverse engineering.”

Conclusion

We live in a difficult period of sputtering economies, constrained cash flows, increasing risk aversion and other negative influences, as we attempt to expand and vary the world's energy assets.

As such, the continued creation of new, and refinement of existing, highly sophisticated debt financing and equity funding mechanisms are critical to the development and construction of new energy projects of all types.



Distributed Wind 2016