



Outreach Strategies & Market Access

Moderator

Britton Rife, DWEA

Speakers

Lisa Daniels, Windustry

Larry Flowers, G4 Wind

Mark Riedy, Kilpatrick Townsend & Stockton LLP



Outreach Strategies & Market Access

Lisa Daniels, Windustry

Distributed Wind Meets Markets – New & Old

Lisa Daniels
Windustry &
Midwest Wind Energy Center

Distributed Wind Energy Association
February 28, 2017



Outline

- Today's market conditions
- Market opportunities
- Stabilizing Influence
- Something new
- Something not so new

Today's Market Conditions – a view from the Midwest

- Looming Farm “Crisis” in rural US – cost of inputs is higher than commodity prices
 - Currently, Farmer’s are stressed
 - Check back in a year, could be official “Crisis”
- The USDA Farm Bill is up for renewal -rewrite
- Small Wind ITC – expired and and it is even harder to compete with solar that has the tax credit in place
- Solar costs continue to decrease
- What’s an industry to do??? Is anybody paying attention to small wind?

Some Thoughts for Getting thru This Rough Patch

- Looming Farm Crisis –
 - work with farmers – speak to their pressure points and work to lower their electricity costs
 - embrace no-money down and discount electricity business models – ie. United Wind’s leasing program
- Go for the high energy users, Hog farms, Dairy Farms, Turkey farms, processing plants etc – businesses using environmental controls, feed mills, ventilation, refrigeration and milking machines

Some Thoughts (continued)

- Get maps of the areas in the state where the Hog and Dairy farms are concentrated
- Go first for the “wind-friendly” communities for permitting

- new Wind Permitting Toolbox

http://nwwindcenter.org/sites/default/files/windpermittoolkit_wa_sept-2015v2.pdf

- Embrace the USDA Farm Bill – collaborate (with Lloyd) to fix the process in REAP

Stabilizing Force

Certification of Small and Mid-Size Wind Turbines

- DOE's CIP program is vital
- Keep it going to improve customer confidence

Community Wind

Either Community-Owned

-locally owned or equity partner

-includes business or community offset for own use

Or

• Community Shared

-PPA

Both are designed more to fit the community needs rather than the financier's

Something New

Wind & Solar Hybrid 5 MW

- 2 GE 2.3 MW
- Up to 1 MW of Solar



Estimated Community Benefits

- 20 local construction jobs, and 0.5 ongoing maintenance positions
- \$87,000 in local tax revenue over 20 years
- \$500,000 in local participation revenue over 20 years

Something Old

- Purpa issues
- Avoided Cost calculation needs more transparency
- this project is at the MN PUC working to get a Purpa Contract with Ottertail Power

Estimated Community Benefits

- 20 local construction jobs, and 0.5 ongoing maintenance positions
- \$87,000 in local tax revenue over 20 years
- \$500,000 in local participation revenue over 20 years

Good News

GE Press Release:

GE Renewable Energy to Equip First Commercial US Integrated Solar-Wind Hybrid Project

“The global market for Hybrid Solar Wind projects could reach **USD \$1.47 billion** by **2024** according to to a report by Global Market Insights, Inc...”



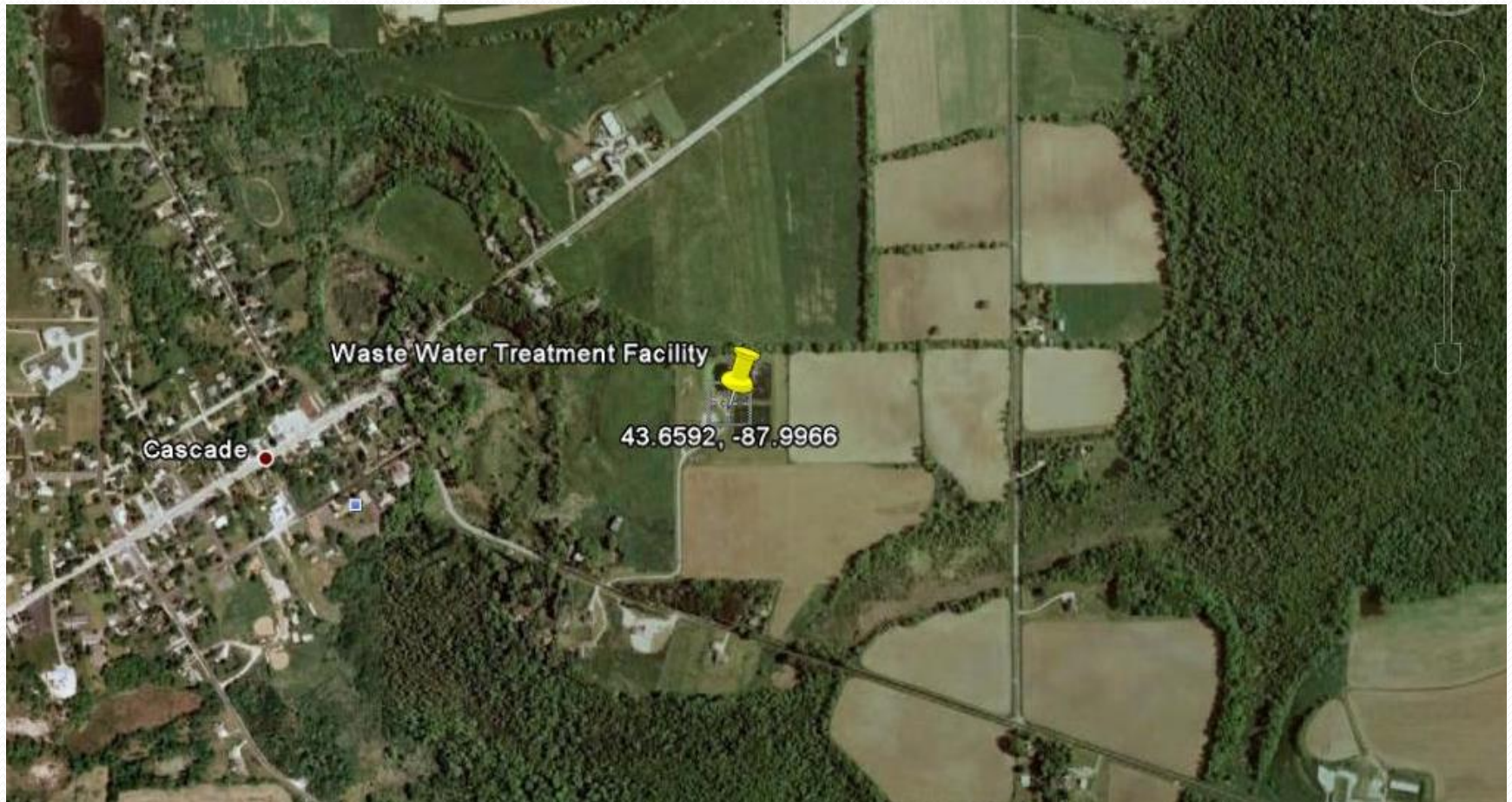
Waste Water and Distributed WIND & Renewable Energy

- 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



Incentives Helped

- Village invested \$504,000
- Wis Focus on Energy \$250,000
- WE Energies Utility \$150,000
- Total \$904,000
- Village's share comes from selling excess power sold thru utility's net metering program & from future energy credit revenues (REC's)

Makes Financial Sense and Source of Pride

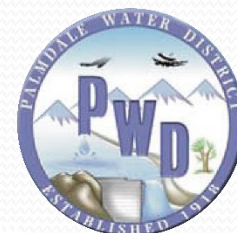
- Payback in 12.5 years
- No increase in costs for taxpayers
- Turbines produce 110% of plant demand
- “Next is solar for village hall and and garage.”
- First in State- 100% RE





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



Atlantic City, NJ



Innovative business model

- Zero money down
- 3rd party own, operate and maintain
- Sells power at discount rate
- First solar at WW in MN
- Solar capacity credits against the standby charges
- Not sure of Solar REC's pricing
- Rejected for Green Reserve Program

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



THANK YOU

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Outreach Strategies & Market Access

Larry Flowers, G4 Wind

Carpe Ventem



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Wind Application Centers

- Modeled after the DOE Industrial Application Centers
- NREL/DOE provided financial support for start up phase
- Provide data analysis, technical assistance and turbine implementation support
- Educate and train engineers to enter the wind industry
- Support teacher training and Kid Wind competitions
- Become the “go-to place” for technical assistance for distributed wind applications



NORTHERN
ARIZONA
UNIVERSITY



FOUNDED 1899



K-12 “Host” Schools

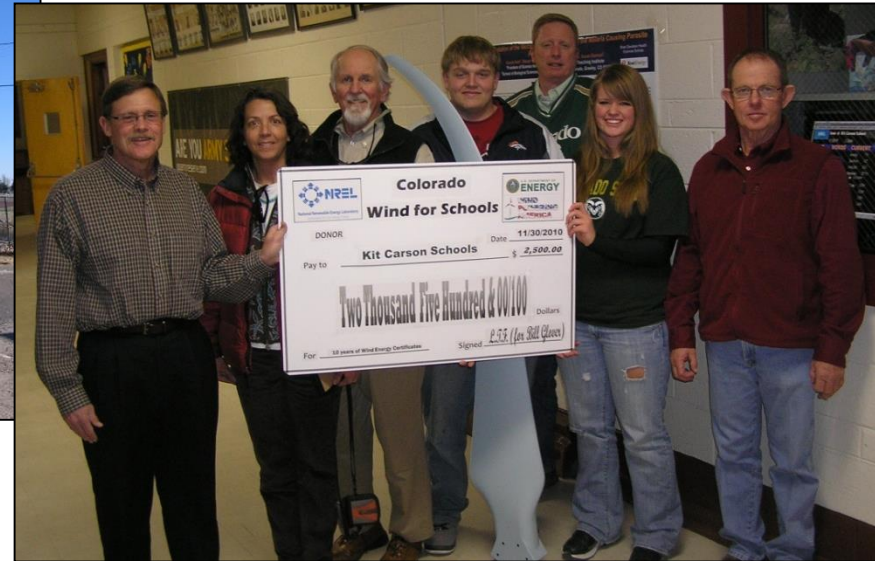
Installs a wind turbine and implements appropriate educational programs

- Supports the installation of the wind turbine through
 - Provides a location to install the turbine
 - Obtains support within the school system
 - Supports getting all local zoning approvals
 - Works with WAC to raise funds and get donations for the project
 - Helps with the installation of the turbine
- Attends teacher training programs
- Implements educational programs at the school(s) as appropriate
- Supports the maintenance of the wind turbine
- Makes data from the turbine available to other schools across the country



Wind for School system installed at Greenbush High Schools, Kansas.
PIX # 16245 Photo Credit Josh Cochran, Greenbush, KS

Colorado



“These wind turbine projects represent another important way all regions of Colorado are participating in our New Energy Economy. Educating today’s young people about the benefits and mechanics of renewable energy systems prepares them for a wealth of future opportunities and demonstrates the crucial role our rural communities can play in mapping out a new energy future for Colorado and the country.” - Colorado Gov. Bill Ritter

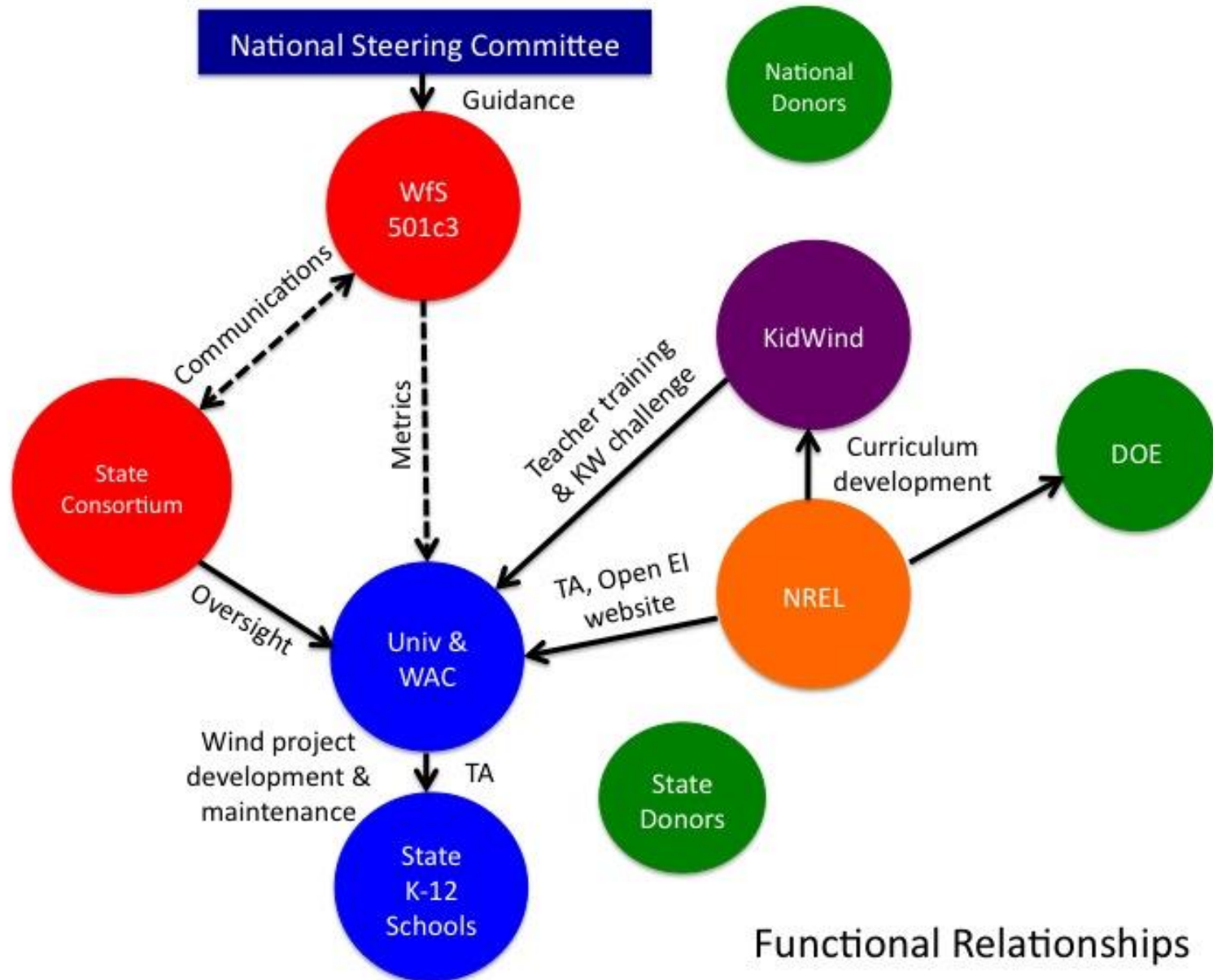
Challenges

- Sustainable funding
- Launching new public-private WfS partnership
- Teacher continuity
- Implementing curricula K-12
- WAC sustainability
- Turbine maintenance
- Integrating KidWind activities
- Engaging wind/RE stakeholders
- Expanding the program
- Turbine installation funding

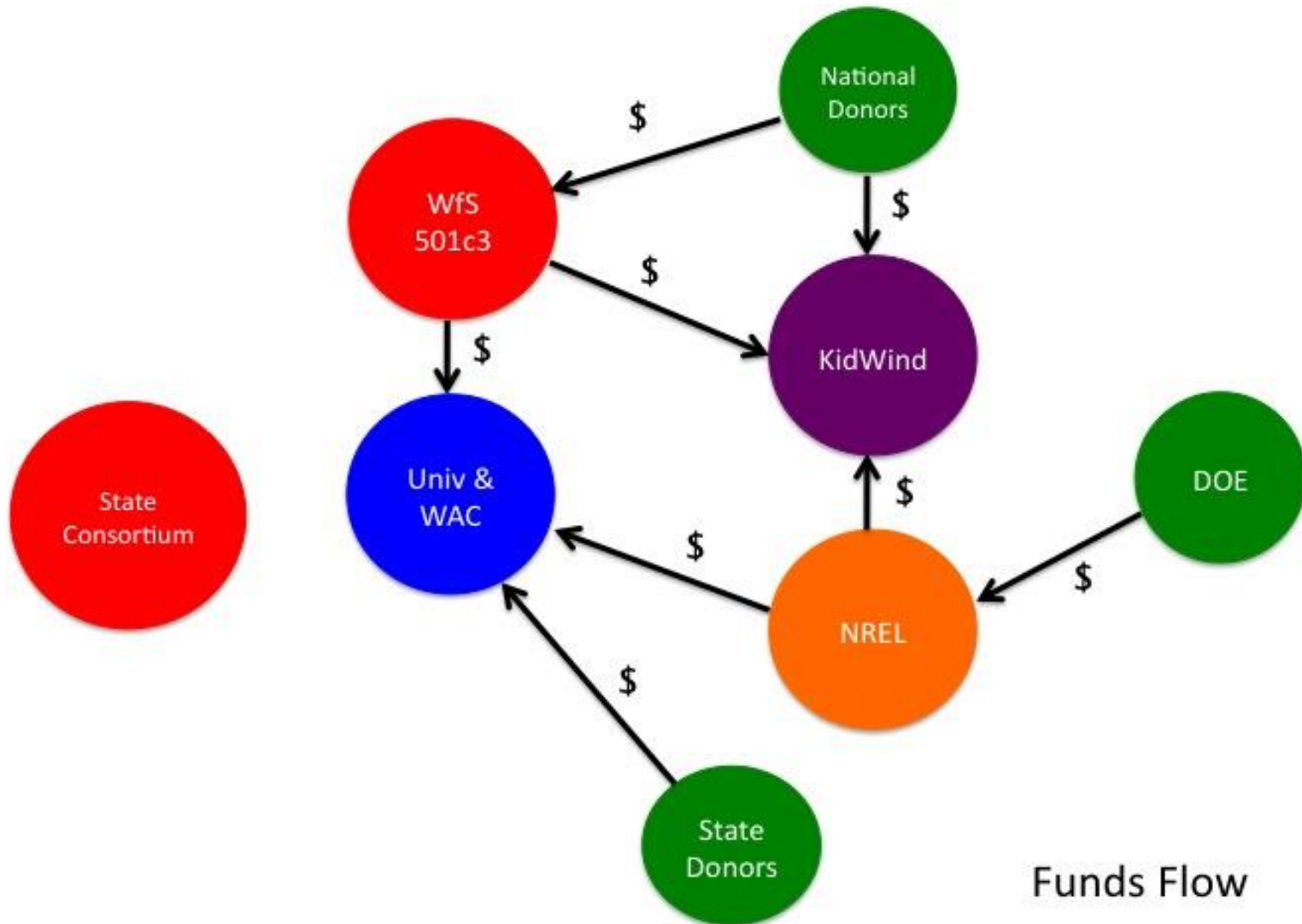


Milford, Utah

The new WfS Functional Relationships



The new WfS Funds Flow





“Tell me and I forget.
Teach me and I remember.
Involve me and I learn.”

Benjamin Franklin



Outreach Strategies & Market Access

Mark Riedy, Kilpatrick Townsend & Stockton LLP



Creative US And International Debt And Equity Financing Mechanisms For Renewable Power And Energy Storage Projects And Technology Companies – Presentation Outline

**Panel: Outreach Strategies & Market Access
Distributed Wind 2017
Distributed Wind Energy Association
February 28, 2017
JW Marriott, Washington, DC**

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Mark J. Riedy, Esq.

- *Has Represented Clients In Renewable And Conventional Energy (Fuels And Power And Infrastructure) Project Finance Since 1978, 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.*
- *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 2015-2017 (#42).*
- *AV Preeminent Rating By Martindale-Hubbell For Last 22 Years.*
- *Named One Of Washington, DC & Baltimore's Top Rated Lawyers For Business & Commercial By Legal Leaders For 2012-2017.*
- *Vice Chairman For Project Finance, American Bar Association, Section For Energy & Natural Resources Since 2010.*
- *Kilpatrick Townsend Ranked #1 Worldwide For Infrastructure Construction and #1 in U.S. for Intellectual Property – Chambers – 2011-2017.*
- *Graduated With JD – Georgetown University Law Center And BA – University of Michigan – Summa Cum Laude And Phi Beta Kappa.*

Challenges And Solutions

A. Growing The Renewable Power And Energy Storage Industry – Challenges and Solutions

1. Challenges – What are the obstacles to growing renewable power and energy storage?

- Lack of Funds at the Company and Project Levels.
 - Grants and Equity.
 - Bank Debt.
- Lack of Certainty in Government Programs.
 - Government Funding Programs – Require Continuing Annual Appropriations for Existing and New Programs.
 - Tax Incentives – Require Extensions of Existing and Creation of New Incentives for (i) small wind, biopower, hydropower and other expired incentives and (ii) energy storage not fully integrated into power units. ESA – written comments to Treasury; Senate Energy Bill would accomplish a similar expansion to non-fully integrated systems.
 - State Renewable Portfolio Standards (“RPS”) – Require Certainty. These state RPS laws have been under attack for the past two years.

2. Solutions – What are the energy and industrial policies needed to move forward?

- Creative Debt Financing and Equity Funding – Company, Project and Portfolio Levels.
- Insurance Protections. The insurance industry is a nascent industry to creatively wrap technology risks.
- Tax Incentives Availability as part of Tax Reform Legislation. The Energy Storage Association (“ESA”) has filed written comments to Treasury to expand the use of 30% ITCs for energy storage beyond the current applicability of energy storage equipment fully integrated into renewable power units. - i.e. non power unit integrated independent systems and those systems integrated into the grid for power stability and resilience.
- RPS Certainty. There was a Senate bill (Senator Udall (D-NM) – S.1264) in Congress for a Federal RPS in the last Congress.

3. Good News – Plenty of funding is available.

4. Bad News – These funds are difficult to access and structure.

Equity And Equity Equivalent Funding

	Type of Funding	Corporate-Level Funding	Project-Level Funding	Dilutive (“D”) or Non-Dilutive (“ND”)
1.	Grants (State and Federal – DOE, USDA, DOT)	✓	✓	ND
2.	Angel Funding (including Crowdfunding (as modified in June 2015 by Regulation A-Plus), Foundations and Family Offices – Prime Coalition, CREO Syndicated, as part of Clean Energy Investment Initiative -- up to \$4 billion (Recent White House Initiative) Equity (Keiretsu – largest/2014 - \$24 billion in angel private placements with 6% to cleantech)	✓		D
3.	Venture Capital Equity (Zymergin raised \$44 million in series A round for its microbial programming to high value bioproducts from Data Collective, Draper Fisher, HVF, Innovation Endeavors, Obvious Ventures, True Venture and Two Sigma Ventures)	✓	✓	D
4.	Private Equity (TIAA – CREF North American Sustainable Energy fund - \$1 billion; UK’s Smart City Enterprise Investment Fund of \$150 MM for energy efficiency; Bill and Melinda Gates Foundation is committing \$2 billion over 5 years for clean technology)	✓	✓	D
5.	Strategic Equity (Bioeconomy companies raised approximately \$1.3 billion in the past 12 months or a 16% increase in deals and 17% drop in deal size per raise). Total acquired Saft for \$1.1 billion. Tesla announced the proposed \$2.6 billion acquisition of Solar City.	✓	✓	D
6.	Infrastructure Funds Equity (USDA’s 4 new 2x \$150 MM, \$100+ MM and \$25+ MM equity and debt funds – Advantage Capital Partners, Rural Business Investment Corporations (“RBICs”) – Made In Rural America, Meritus and Innova, respectively, KKR raised a 2 nd fund of \$3.1 billion, and Sovereign Wealth Funds)		✓	D
7.	State (California, Connecticut, Hawaii, Illinois, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, New York, Washington) and Federal Green Funds, State Revolving Funds (tend to be grants, loans, loan guarantees and not equity as government entities shy away from investments)		✓	ND
8.	International Green Funds (Australia, Brazil, Canada, Caribbean Energy Security Initiative (\$20 million US fund), European Investment Bank (Euros 8 billion), India, Malaysia, UK) (tend to be grants, loans, loan guarantees and not equity as government entities shy away from investments)	✓	✓	ND
9.	Tax Equity – ITCs, PTCs, Bonus and MACRs Depreciation and NMTCs		✓	Initially D to later ND
10.	Sponsor Equity – Project Developers, Hedge Funds (use has grown in last 2 years) and YieldCos		✓	D
11.	Portfolio Equity - MLPs/ REITs/ YieldCos		✓	D

Equity And Equity Equivalent Funding

B. Grants

1. DOE – Office of Energy & Efficiency programs of single to double digit \$ millions in grants available and ARPA-E
 - \$30 MM program for energy storage grants.
 - Wind grants previously in EERE’s Electricity Office in 2016: \$1.8 million for wind turbine blades and \$10.7 million for offshore wind development.
2. USDA – \$500,000 grants in the Section 9007 Renewable Energy for America Program (“REAP”).
3. SBA – Small Business Innovative Research grants (“SBIRs”).

C. Early Stage Equity

1. Angel Funding – 200,000 – \$3 MM – Kieretsu Forum is the largest angel funder.
2. Crowdfunding – \$34 billion raised – 2009 - 2015 – average ROIs 5% - 7.5% – Mosaic and Abundance are top crowdfunders.
3. Family Offices – can be a type of strategic equity – often in for multiple private placement rounds and don’t neglect large Texas oil and gas families that need to place funds to use in times of depressed oil and gas prices.

Equity And Equity Equivalent Funding

D. Venture Capital Equity – Global Cleantech VC was \$10.8 billion in 2015 – up 11% over 2014. VCs seek double digit percent returns in 7 - 10 years – Expensive money at early stage company level. Seek double digit returns.

1. Energy Storage – raised 5.3% of this \$10.8 billion in cleantech VC funding in 2015 or \$572 MM. However, interestingly, it's off 50% in 1st quarter 2016.
2. Energy Storage – 1st Q 2016 had 54 million in 10 VC deals, compared to \$108 million in 6 deals in 4th Q 2015.
3. Energy Storage - In 2016, Sunverge Energy (\$36 million), VionX Energy (\$5 million), Skelton Technologies (\$4.3 million) and Voltaiq (\$1.6 million) raised VC funds for energy storage.
4. Energy Storage – it showed a 41.2 MW storage deployment for 2nd Q 2016, of which 27.19 MW was behind the meter. For 2016, GTM projects 287 MW of new energy storage deployment.
5. Solar – VC investment levels up in 2015 – due to the 5 year extension of the tax incentives – ITC, PTC, Bonus Depreciation. The ITC extension is expected to add 25 GW of new solar power over that 5 year period costing nearly \$40 billion.
6. Wind – VC investment levels up in 2015 to \$520 million – due to the 5 year extension of the tax incentives – ITC, PTC, Bonus Depreciation. The PTC extension is expected to add 19 GW of new wind power over that 5 year period. In 2016, North America added 4 GW of wind power of 9.4 GW under construction. AWEA says there is 82 GW of wind power up and running.
7. Global – Q1 2016 – \$7.1 billion in global VC closings.

E. Company and Project Levels Private Equity – later stage funding at company and project levels. Looking for double digit % returns.

Equity And Equity Equivalent Funding

- F. Company and Project Levels Strategic Equity** – O&Ms, EPCs, Utilities, etc. – their participation has become very important and at earlier funding rounds as VCs have pivoted to IT and social media.
- G. Infrastructure Funds Equity** – primarily at project level.
1. Private Equity, Strategic Equity and Infrastructure Funds Equity often cross over into each other's spaces.
- H. State and Federal Green Funds** – Generally Grants, Loans and Loan Guarantees, but not Equity.
1. Connecticut Green Bank Fund – \$50 - \$100 million available annually. To date, it has generated more than \$1 billion in cleantech investments since 2012.
 2. New York Green Bank/NYSERDA/REV – nearly \$5 billion in these programs.
 3. Hawaii Green Bank – new \$150 million lending facility under GEMS for 4% loans according to my discussion with Commissioner Lorraine Akiba. Has not been significantly used as some Hawaiian commercial banks can provide even lower cost funding. Hawaii's RPS, increasing to 100% by 2045, will spur investment.
 4. California Green Bank – approximately \$13 billion.
 5. Michigan Green Bank – new \$105 million.
 6. Rhode Island Green Bank – new \$16 million.
 7. Washington State Clean Energy Fund – new \$36 million.
 8. State Revolving Funds - \$3 billion in funds allocated to states by DOE under 2009 Recovery Act. Funds still available – use for working capital, reserve accounts, credit enhancements, grants, etc.

Equity And Equity Equivalent Funding

- I. **International Green Funds** – Generally used for Grants, Loans and Loan Guarantees, but not equity.
 1. Australia – many new funds – with nearly \$15 billion available for grants, loans and loan guarantees, including energy storage.
 2. United Kingdom
 3. Canada
 4. India
 5. Brazil
 6. Asia
 7. Europe
 8. Africa
 9. World Bank’s Global Environmental Fund (“GEF”)
 10. United Nation’s Green Climate Fund (“GCF”)
 11. Climate Investor One Fund (“CIOF”)
 12. Saudi Arabia Public Investment Fund (“PIF”) – new \$2 trillion from Sovereign Wealth Funds and other funding sources.

Equity And Equity Equivalent Funding

J. Tax Equity

1. ITCs – 30% for 5 years for solar (scales down from after 2019 – 2022 and then is 10% in perpetuity) and wind (scales down after 2017 – 2019 and then phases out); biopower and others have 30% ITCs through December 31, 2016.
2. PTCs – 2.3 cents/kwh for wind/1.1 cents/kwh – 2.3 cents/kwh for biopower – the wind power PTC scales down for wind after 2017 until phased out on December 31, 2019 – while the PTC phases out for biopower and others on December 31, 2016.
3. Bonus Depreciation – 50% scales down through 2019.
4. Sell under complex structures – sale-leaseback, partnership flips, inverted leases – for cash up front to use in projects – small number of tax equity providers – approximately 25 - 30.
5. NMTCs – can provide 10% - 20% of total project costs to a project financing depending on project size. Must locate in qualified economically distressed areas and use locals in the project job force.
6. Tax Incentives Extension Legislation.
7. EB-5 funding – visas for funds – can be significant to a project (structured as debt or equity).
8. New “In Construction” Ruling from IRS that further clarifies the use of the PTC and ITC.

K. Sponsor Equity

1. Project Developers.
2. Hedge Funds – new to cleantech in last 3 years. Require double digit returns and quick exits (2 – 3 years).
3. YieldCos – when buying and operating assets.

Debt

L. Portfolio Equity

1. MLPs – \$650 billion – low cost capital raising mechanisms with energy storage being assigned into corporation below the MLP (“Hybrid MLP”). Requires new legislation to include – I co-wrote Senator Coons MLP Parity Act proposed legislation several years back.
2. REITs – \$960 billion – low cost capital raising mechanisms with energy storage being assigned into corporation below the REIT (“Hybrid REIT”). Energy storage may work in the REIT itself.
3. YieldCos – low cost capital raising mechanisms with renewable power and energy storage being assigned into Yieldcos. Coming back (Abengoa and SunEdison Yieldcos are solvent despite parent bankruptcies).
4. MLPs and REITs – 1 level of taxation at higher ordinary income tax rates versus Yieldcos at 2 levels of taxation at lower capital gains tax rates.
5. MLPs/REITs – can’t monetize tax incentives due to at risk depreciation and passive loss rules.
6. Yieldcos – can monetize tax credits within the vehicle.
7. Hybrid MLPs/REITs – can monetize tax credits in the corporation below the partnership – an upside-down Yieldco structure.

Debt

M. Debt – Government Loan Programs

1. DOE

Section 1703 (commenced in 2005)

- a. Uncapped Federal Finance Bank/Treasury Department (“FFB”) loans credit enhanced by DOE loan guarantees.
- b. New Facility Plan for multiple (10, 20, 30, projects) smaller projects – like a credit line to draw approximately 3.5%/30 year funding for approximately 70% of total project costs. We have a behind meter client filing in Part 2 and an in front of the meter client filing a Part 1 Application. Wind and solar can participate with energy storage or alone with demonstrable new technologies and/or energy efficiencies/savings.
- c. Need commonality to make multiple projects appear to be one – like one offtaker or a couple similarly investment grade or near investment grade credit-rated offtakers.
- d. Senior debt amounts of \$4.5 billion available in Renewable Energy (REEE) and \$8.5 billion (recently \$2 billion obligated to reduce the amount to \$6.5 billion) available in Advanced Fossil Energy (AFE) Program – DOE extended the rounds through November 30, 2019.
- e. To date, more than \$65 billion senior debt applications have been filed in REEE, AFE, Nuclear and ATVM with \$41 billion available.

2. USDA

- a. Section 9003 of Farm Bill - Integrated Biorefineries (commenced in 2008) – \$250 million of senior debt per projects. \$1 billion available – can integrate storage into biopower unit further integrated into a biorefinery.
- b. Section 9007 of Farm Bill (commenced in 2008) – \$25 million of Senior Debt – can stack 9007 and B&I together. \$200 MM plus available.
- c. Business & Industry (“B&I”) Program (commenced in 1972) – \$25 million of Senior Debt – can stack B&I and 9007 together. New rule for 1st time permits Loan Guarantee over (1) Subordinated Debt and (2) Leveraged Loan in a NMTC transaction.
- d. Rural Utility Service (“RUS”) Program For Electricity (commenced in 1935) – direct uncapped FFB loans with unlimited available funding at 12.5 basis points over Treasuries (2.18% on 20 year Treasuries on June 11, 2016) for shorter of PPA term or 35 years with two models: 100% corporate finance v. 75% project finance.
- e. Energy Efficiency and Conservation Loan Guarantee Program (commenced in 2014) – uncapped 40 year direct FFB loans and loan guarantees with unlimited available funding for energy storage and energy efficiency projects at approximately low interest rates.
- f. Rural Business Investment Corporation (“RBIC”) – allows companies to access companies in the USDA’s Farm Credit Agency for loans/equity into funds for loans and investments. Current RBICs are \$25 million, \$100 million and two at \$150 million in 3 funds to date – use for one’s projects.

Debt

M. Debt – Government Loan Programs (continued)

3. SBA

- a. Small Business Loans.
- b. Small Business Innovation Research – Grants.
- c. Small Business Investment Corporations – Preferred Equity.

N. Other Project Financing Mechanisms

1. Credit Enhanced Project Company Bonds – taking non-investment grade project company debt to investment grade with loan guarantee/insurance wraps. 150 – 200 basis points over approximately 2.80% (for 20 year) and 2.60% (for 10 year) Treasury rates (as of February 2017) plus a small percentage spread) for the credit enhanced portion of senior debt – sell the corporate debt/project company bonds to institutional market.
2. Clean Power Plan Allowance Funding – GHG emissions allowances sold to utilities to finance up to 100% of clean energy projects through mass-based state CPP plans once the Supreme Court stay is lifted and current lawsuit is resolved in favor of EPA, if the Trump Administration does not fully rescind these rules but instead modifies them.
3. Green Bonds – more than \$84 billion exist in 2017.
4. Insurance Policies – to wrap technology risk, protect revenue streams, provide floors on offtake agreements; new Allianz Risk Transfer has a 10 year wind revenue hedge with an annual fixed payment to provide revenue certainty. May be provided beyond wind projects.
5. Project Capital Stacks – structured to reduce sponsor equity.
6. International Debt – US Ex-IM, OPIC, TDA – other Export Credit Agencies and Multilateral Development Banks.

Other Financing Mechanisms

O. Tax Incentives

1. Renewable Energy Tax Incentives.
2. Required Government Action – extend the PTC and/or ITC for small wind, biopower, hydropower and expand 30% ITC for energy storage as part of any Tax Reform Legislation.
3. R&D Tax Credit permanently established in December 2015 Tax Extenders portion of Omnibus Appropriations Act.

P. ITC For Integrated Solar Storage

Q. RPS Certainty

R. Conclusion



Distributed Wind: Made in America

Moderator

Kevin Schulte, SunCommon NY

Speakers

Mike Bergey, Bergey Windpower

David McDougall, Northern Power Systems

Thomas Williams, Ventera Wind



Distributed Wind: Made in America

Mike Bergey, Bergey Windpower

Manufacturing at Bergey Windpower

DWEA
Distributed Wind 2017

Mike Bergey



Bergey Windpower Co.

- ❖ Established in 1977, sole focus on small wind turbines for distributed applications
- ❖ Over 9,500 installations, covering all 50 States and over 100 countries
- ❖ ~ 90% domestic content on 10 kW
- ❖ Most manufacturing is in-house:
 - ❖ Blades
 - ❖ Alternators
 - ❖ Nacelle & tail
 - ❖ Inverters and charge controllers
 - ❖ Guyed towers



Bergey Windpower Products



1 kW
8.2 ft Dia.



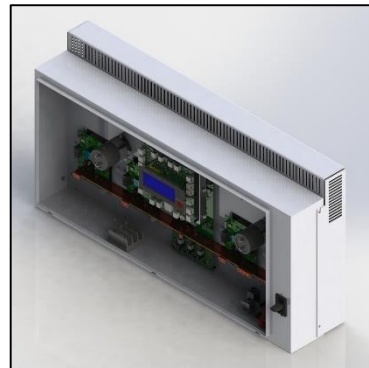
6 kW
20.2 ft Dia.



10 kW
23 ft. Dia.



Towers: Multiple styles, 60 – 160 ft.



12 kW Inverter & 48 VDC Battery Charger

Reluctant Manufacturer

- ❖ Oil & gas industry price competition forced us into in-house manufacturing
- ❖ 1982-2005: Leased 4,000 ft² from Univ. of Oklahoma
- ❖ WWII Navy building – mess hall & kitchen
- ❖ All manual processes – high labor content



Xiangtan Bergey Windpower Co.

- ❖ Sept. 1998 – Feb. 2001
- ❖ First PRC government approved JV in wind technology
- ❖ Partner: XEMGC, a 15,000 person state-owned enterprise
- ❖ Production for Chinese market only
- ❖ Large RE program delayed, causing losses

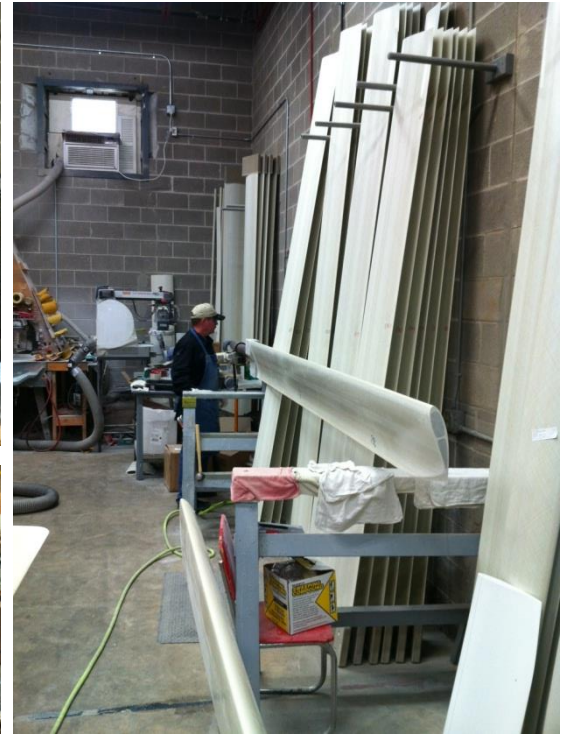


Beijing Bergey Windpower Co.

- ❖ Feb. 2001 – June 2012
- ❖ 100% BWC subsidiary
- ❖ Produced all BWC 1 kW's, and 10 kW's for China region
- ❖ Downtown office, factory 30 km outside
- ❖ Shutdown in 2012 due to difficult business environment



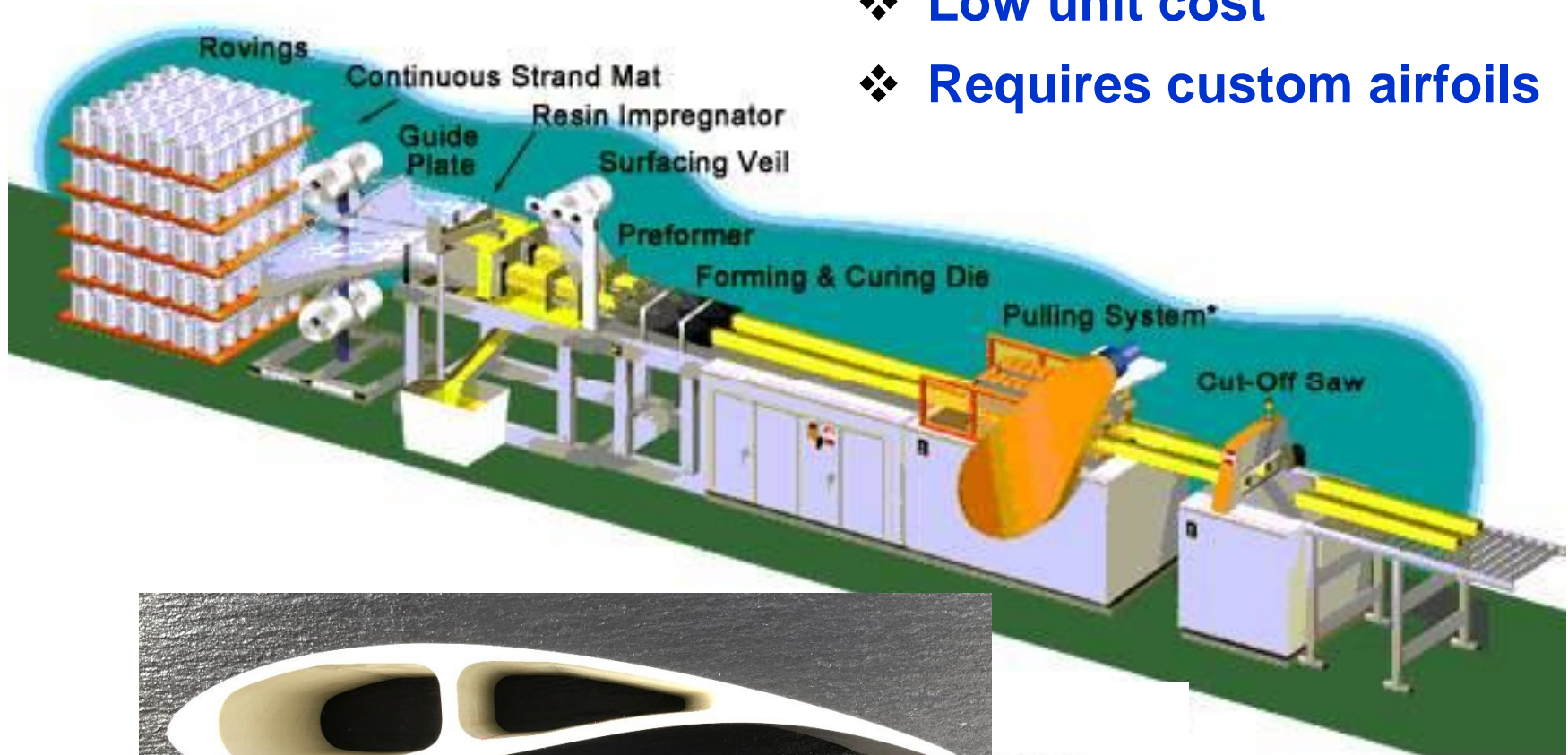
Beer Warehouse to Turbine Factory



- ❖ 24,000 ft² on 5 acres
- ❖ 5 shop areas, plus paint booth & warehouse

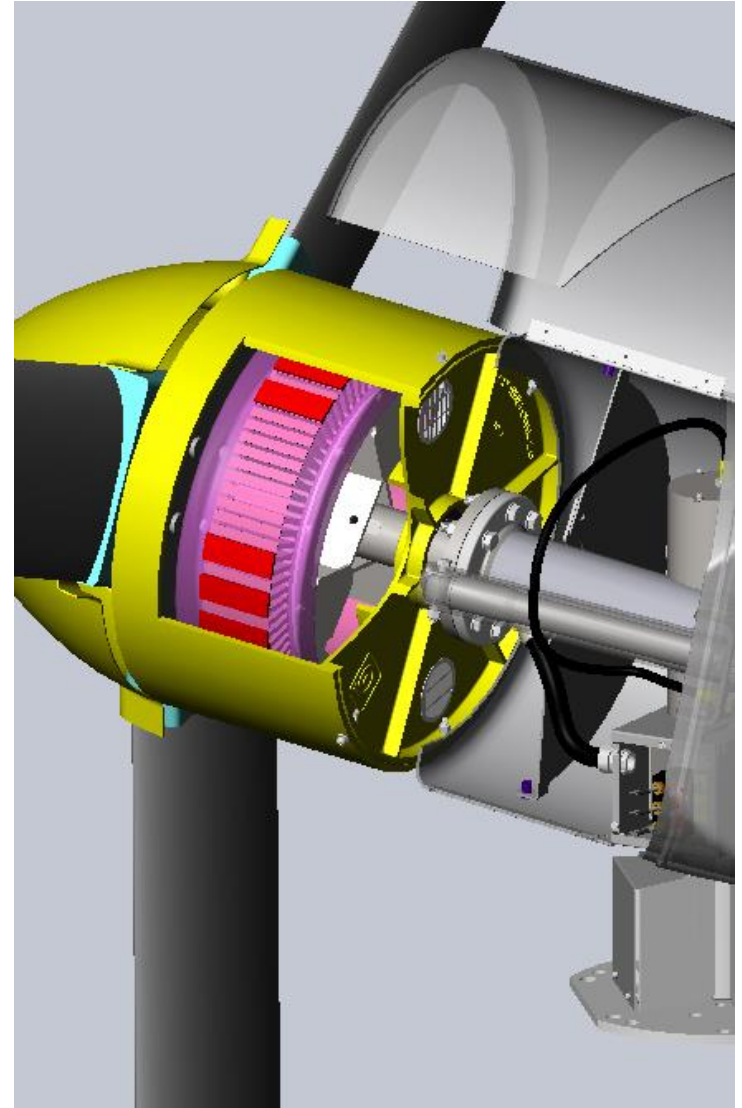
Pultruded FRP Blades

- ❖ High tooling cost
- ❖ Low unit cost
- ❖ Requires custom airfoils



10 kW Alternator Stator Lamination

- ❖ 23" Dia., 96 slots
- ❖ 1982, USA: 6 arc segments, tooling: \$2000, \$450/shipset, stacking time
- ❖ 2000, China: Single piece, single shot stamping, tooling: \$12,500, \$780/shipset, logistics issues
- ❖ 2008, USA: Progressive stamping dies, tooling: \$120,000, \$490/shipset, higher inventory cost, no logistics issues



Lessons Learned

- ❖ **In a fair fight, U.S. manufacturing can compete worldwide if labor saving investments are made**
- ❖ **Costs and gross margins are highly sensitive to monthly production volume, which varies greatly in small wind industry**
- ❖ **There's great value in retaining great employees**
- ❖ **Advanced technology increases competitiveness**
- ❖ **Government support matters**

Thank you





Distributed Wind: Made in America

David McDougall, Northern Power Systems



Northern Power Systems

DWEA 2017 – Made in America

David McDougall

Director of North American Sales, Distributed Wind

Agenda

- ❖ Northern Power Systems Background
- ❖ US Insourcing Advantages
- ❖ US Insourcing Disadvantages
- ❖ Balancing Benefits and Risks
- ❖ Progressive Policies to Drive US Growth
- ❖ Life Cycle Costs
- ❖ Export Success



Northern Power Systems – Formational History

- ❖ Following our first wind turbine development in the early 1990's, **we scaled up and optimized performance for low-medium wind speeds.** Our **innovative gearless direct drive, permanent magnet generator** wind turbines can provide clear economic benefits in all kinds of wind regimes.
- ❖ The NPS 100 provides unsurpassed reliability and has a **flawless track record of surviving extreme winds**, from the bitter colds of Alaska to the tropical cyclones of the Caribbean.



1999 | 2000 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2009 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 +



45 KVA micro grid simulators

2.2MVA POC wind converter

550 KVA Ultra-Cap Line interactive UPS

900KVA DG Interface

1800KVA Mobile DG interface

2.5 MVA HS-VFD

1.2MVA HS-VFD

900KVA VSG

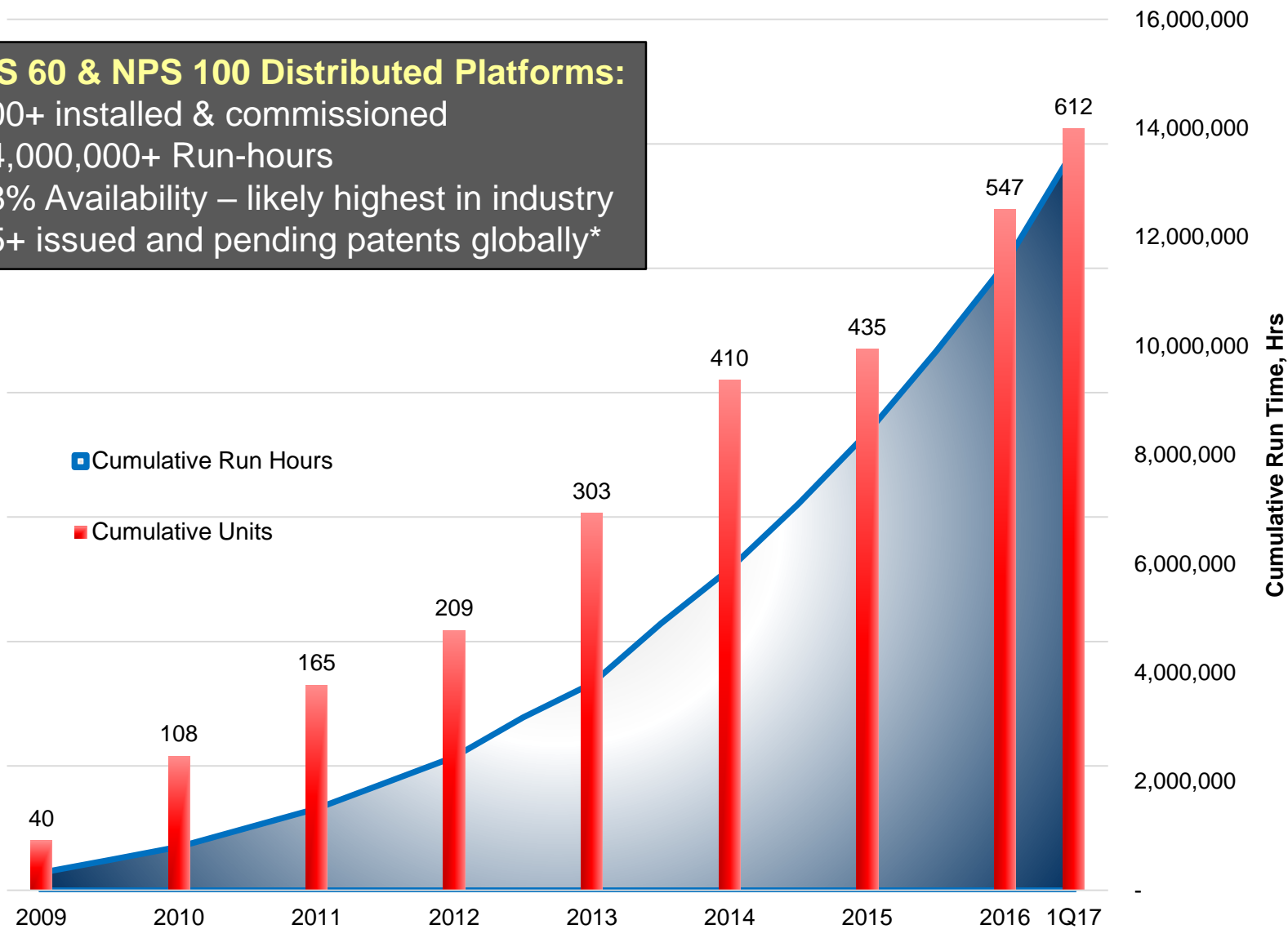
900/1800 KVA PCS for ESS



Distributed Wind: Proven Growth and Performance

NPS 60 & NPS 100 Distributed Platforms:

- 600+ installed & commissioned
- 14,000,000+ Run-hours
- 98% Availability – likely highest in industry
- 85+ issued and pending patents globally*



* Some now shared with WEG as our Utility Wind partner

Wind Turbines at Dealerships Attract EV Aficionados

❖ Location

- Columbus, OH

❖ Project

- Wind turbine powers 15-50% of car dealership energy needs

❖ Renewable Technology

- NPS 100-21, 37 meter towers

❖ Average wind speed

- 6.4 m/s (14.3 mph)

❖ Annual Energy Production

- 292,000 kWh

Power produced on site supports energy independence



US Insourcing Advantages

- ❖ Proximity to engineering resources:
 - Allows for rapid product development and commercial deployment of new technology
 - Real-time manufacturing feedback leading to efficient manufacturing processes.
 - Rigorous cross functional engagement with collocated resources that facilitates problem solving and communication.
- ❖ Opportunity to inspect and validate parts, and to identify and resolve any potential nonconformities before shipment to the customer.
- ❖ Allows OEM to maintain direct control over IP and internal manufacturing and testing processes and procedures: ensuring quality standards are maintained.
- ❖ Creates pool of employees that are familiar with the technology and business operations that are specific to the industry. Opportunity to draw upon these internal resources as the business grows.
- ❖ 20 year design life provides steady employment for maintenance technicians.



US Insourcing Opportunities

- ❖ Broader overall small wind industry can help solve:
 - Higher cost subcomponents
 - Regulatory and compliance hurdles to swiftly expand adoption (i.e., certification requirements)
 - Higher associated fixed overhead costs through more qualified personnel and facilities
 - Benefits of vertical integration
 - Offset cyclical and seasonal industry; with more opportunities to find suppliers that can absorb the variability



Balancing Benefits and Risks

- ❖ Foreign countries have at times heavily subsidize export industries creating false cost targets for those outside of that country, and making it more challenging for US manufacturer's to compete.
- ❖ US manufacturer's often have the most efficient manufacturing processes, but cannot overcome the low cost of labor in other countries.
- ❖ The newest technologies are being developed in the US and EU. Suppliers in low cost countries have not developed robust engineering capabilities.
- ❖ Must understand fully landed costs for each component based on the countries of origin and destination. The importation of a component from China or EU can increase the landed costs by up to 30%.
- ❖ The drive to delivery subsidy agnostic offerings will continue to pressure OEMs to reduce cost which necessitates considering low cost country sourcing.

OEMs must strike the right insourcing and outsourcing balance to provide customers with the best technology at the lowest cost possible. Processes must exist within an organization to weigh these benefits and risks to make the right choices in a fluid manner.



Progressive Policies to Drive US Activity

- ❖ Offer continuous sources of funding to design and develop lower cost technologies while increasing energy yields.
- ❖ Provide corresponding subsidies for those industries that are negatively impacted by foreign subsidies.
- ❖ Harmonize product standards to maintain the integrity of the distributed wind OEMs: I.e., permitting standards to streamline the permitting process and adaptive certification process.
- ❖ Acknowledge the fossil fuel \$5.3T untaxed negative externality (deferred costs), and establish a carbon tax to level the playing field.
- ❖ Establish a friendly regulatory and compliance framework for US manufacturer's that maintains our commitment to the environment and worker's rights.
- ❖ Levelize the renewable subsidies to allow wind to compete with solar.
- ❖ Help promote the benefits of Distributed Wind to industry.
- ❖ Support affordable financing options that mitigate owner risks
- ❖ Create new and simplified incentives / interconnect policies



Life Cycle Costs

- ❖ Total retail value of electricity (~2X product price)
- ❖ Job Creation
 - Product value
 - Service value (Over ½ product price)
- ❖ Carbon offset
- ❖ Reduction in political and military costs
- ❖ Grid reliability (Productivity and infrastructure costs)

It isn't just about the product that's made in the USA, but the service jobs, energy and benefits to the externalities.



Global Footprint – Export Success

Over 400 International NPS Systems Installed Worldwide Including 2.1 MW Turbines With Our Brazilian Partner WEG

- ❖ Strong installed base in western countries
- ❖ Poised to take distributed wind to emerging markets
- ❖ Our technology is strong, but global competition is heating up.



Several regions across the globe are facing difficult conditions:

- High power costs
- Weak grid infrastructure
- Desire for more sustainability and independence

Distributed Generation should be part of the solution



Additional Information and Contact Details



For additional information on the products and services Northern Power Systems offers please visit: <http://www.northernpower.com/>

For specific inquiries contact:

Dave McDougall - Director of North American Sales, Distributed Wind

Office (617) 871-6069

Cell (802) 279-9018

Northern Power Systems

www.northernpower.com

Advanced permanent magnet direct drive wind turbine technology.





Distributed Wind: Made in America

Thomas Williams, Ventera Wind

VENTERA WIND



MADE IN AMERICA

TOM WILLIAMS

CEO

VENTERA WIND, INC.



Goals for Distributed Wind

Produce Product with Levelized Cost of Electricity that beats grid supplied power: 6-7 cents per kWh.

Reduce Installed Cost to \$4,000-\$5,000 per kilowatt of capacity with capacity factors in the high 30's or better.

Eliminate warranty cost through quality improvement.

Teach the customer that its about quality, performance and cost per kilowatt hour and not cost per kilowatt of capacity.

US Competitive Advantages

High quality of design

Access to wide range of manufacturing processes across a broad spectrum of industrial disciplines

Long history of understanding the relationship between, quality, cost, innovation, marketing and product performance

Access to state of the art materials science

We can beat overseas cost through intelligent process design

US Competitive Disadvantages

We have created standards that stifle innovation and slow speed to market with new product improvements and innovations

Many materials we invented can only be sourced overseas

Strong dollar and concern over trade relationships

We have made it impossible to attract control system manufacturing

Support structure industry refuses to innovate, improve quality and reduce cost.

Quality

Good quality means a predictable degree of uniformity and dependability with a quality standard suited to the customer

--W. Edwards Deming

Quality planning consists of developing the products and processes required to meet customer's needs

--Joseph M. Juran

Cost is more important than quality but quality is the best way to reduce cost.

--Genichi Taguchi

Process Design as Product Design

If you can't describe what you are doing as a process, you don't know what you're doing.

--W. Edwards Deming

Design is to design a design to produce a design.

--John Heskett

Innovation

Because its purpose is to create a customer, the business has two and only two functions: Marketing and Innovation. Marketing and Innovation produce results. All the rest are costs.

--Peter Drucker

All improvement happens project by project and in no other way.

--Joseph M. Juran

I always stress to my clients that they have to be ready to change. You have to be prepared to make your innovation obsolete. But many companies aren't prepared to do that.

Peter Drucker.

Ventera Wind Innovations

Started with a flawed machine with brilliant design innovations:

- Initial weight of 600 lbs. or 60 lbs. per kilowatt of capacity.
- Parts designed for manufacturing process not the other way around.

Product improvements:

- Documentation of every part failure and root cause determination
- Testing every part or design change in field in at least five locations
- Involving production, design, installer and customer input in each design change.
- Constant communication with subcontractors on process design

- Reduced warranty claims from 20% of revenues to less than 1% of revenues.

Results

Removed an additional 35 pounds from turbine weight

Reduced warranty claims from 20% of revenues to less than 1% of revenues

Increased output by 15-25% across all upgraded units in field

Next Generation

Improved Stator—upgraded insulation, VPI coatings, end turn wrappings and shaping:

Improved blade injection molding and resin specifications combined with new alloys for component parts.

30-150% increase in strength of components, 25% reduction in cycle time, 5-10% weight reduction.

What Government Can Do

Basic Science

Shift from tax incentives to capital supply—two ways:

Finding incentives for SBIC's to fund manufacturing
SBA and Government Guaranteed Loans for energy
manufacturers

Tax Cash Flows—treat Capital Spending as
Expense: Accelerated Depreciation and
Expensing R&D



Getting to 30 GW by 2030

Moderator

Scott Sklar, The Stella Group Ltd.

Speaker

Jason Kaplan, United Wind

Forrest Milder, Nixon Peabody LLP

Alice Orrell, PNNL

Scott Sklar, The Stella Group Ltd.



Getting to 30 GW by 2030

Jason Kaplan, United Wind



Getting to 30 GW by 2030

Forrest Milder, Nixon Peabody LLP



Presentation for

Distributed Wind 2017

Tax Credit Basics and Begun Construction

February, 2017

Forrest Milder

fmilder@nixonpeabody.com

617-345-1055



Introduction to Tax Credits

- Tax Credits save taxes, dollar-for-dollar
- Tax deductions save taxes, based on tax rate.
- So, a \$1 tax credit saves \$1 in taxes, a \$1 deduction saves 35 cents in taxes.



Tax credits for wind

- 30% investment tax credit (or ITC). If the facility costs \$100, then the credit is \$30
- 2.3 cents per kwh production tax credit (or PTC). If the facility sells 1000 kwh of electricity, then it can generate \$23 in tax credits
- These credits are being phased out.
- The small wind credit (also 30%) has ended, although there are hopes of reviving it.



Credit Phase Out for PTC

- Construction Begins by: PTC for Wind is
 - Before 12/30/16 No reduction
 - In 2017 Reduced by 20%
 - In 2018 Reduced by 40%
 - In 2019 Reduced by 60%
-
- E.g., 2.3 cents, reduced by 60% is .92 cents.

Credit Phase-out for ITC

- Construction Begins by: ITC for Wind is
 - Before 12/30/16 30%
 - In 2017 24%
 - In 2018 18%
 - In 2019 12%
-
- E.g., \$1000 project begun in 2016 gets a \$300 credit; the same project gets a \$240 credit.

Special Rules for Small Wind

- The Small Wind Tax Credit has ended
- **IF** the Congress gave small wind the same extender that it gave to solar (they're both in the same Code section), then small wind would qualify for a larger credit than the wind credit. To illustrate: provided a solar facility is placed in service by 2024, the credit is 30% if construction began before 2020, 26% if it began in 2020, 22% in 2021. It is otherwise 10%.
- But remember the first point!



Overview

- The bottom line: we really care when a project “begins construction”
- The IRS has published a lot of notices.
- You have to interpret the rules yourself, or with the help of a tax professional. You can’t get a letter ruling or other written approval from the IRS. If your project has an investor, you may need a law firm opinion.



Basic Concepts

- Physical Work Test – excavation, set anchor bolts, pour concrete, etc. by the begin construction date
- 5% Safe Harbor – incur 5% of the cost of the project by the begin construction date
- Continuity Requirement –Keep working on the project till it's finished
- Continuity Safe Harbor – The IRS will ASSUME that you kept working if you finish by a certain date. This is MUCH easier than proving continuity



Physical Work Test

- No numerical standards.
- Should be obviously physical.
- Preliminary work doesn't count
- No matter how much paperwork you do, it doesn't count.

5% Safe Harbor

- Some investors really like to see a mathematical computation signed off by an accountant
- Generally need delivery and a genuine obligation to pay before the end of the year.
- Can also qualify by paying for the item in full before the end of the year and getting delivery of the item within 3-1/2 months of payment.
- A project can include used property, BUT the FMV of the used property can't be more than 20% of the total cost, and the 5% test is based only on the cost of the new property.



Continuity Requirement

- Once begun, project must be worked on continuously
- There are two more safe harbors –
 - Finish by the end of the 4th year after you started.
(e.g., start is June 5, 2016; Safe harbor runs until 12/31/20)
 - Finish by December 31, 2018
- Note that once you start a project, the clock is running. You can't just start over.



Exceptions and Modifications

- Can change the location
- Can transfer to someone else if there is at least 20% common ownership
- Can transfer to someone entirely different if there are permits or a PPA or other evidence of a business also being transferred.

Thanks!

Forrest Milder

fmilder@nixonpeabody.com

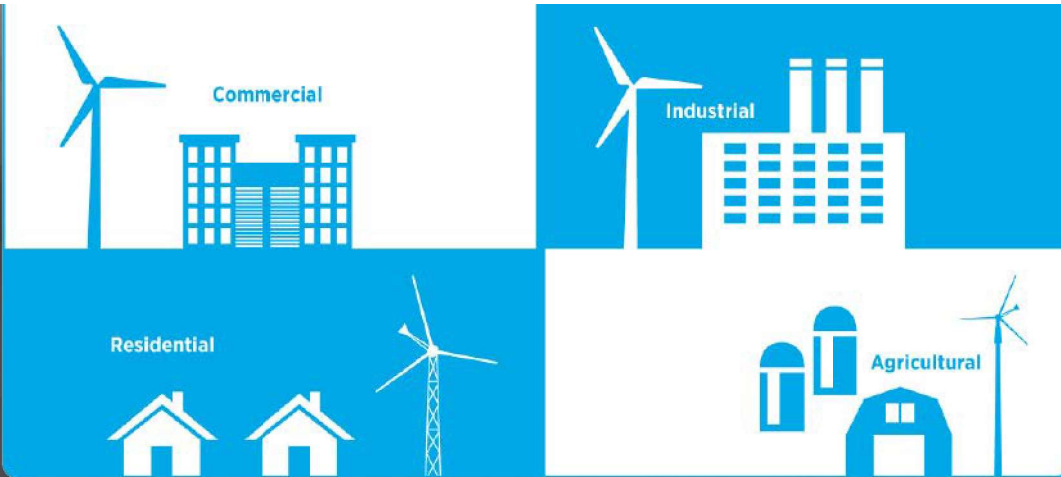
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Getting to 30 GW by 2030

Alice Orrell, PNNL



Pacific Northwest
NATIONAL LABORATORY

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Distributed Wind Markets: Where Policy, Wind, and Electricity Cost Meet

ALICE ORRELL, NIK FOSTER, JULIET HOMER,
SCOTT MORRIS, JERRY TAGESTAD

Distributed Wind 2017 Business Conference

February 28, 2017

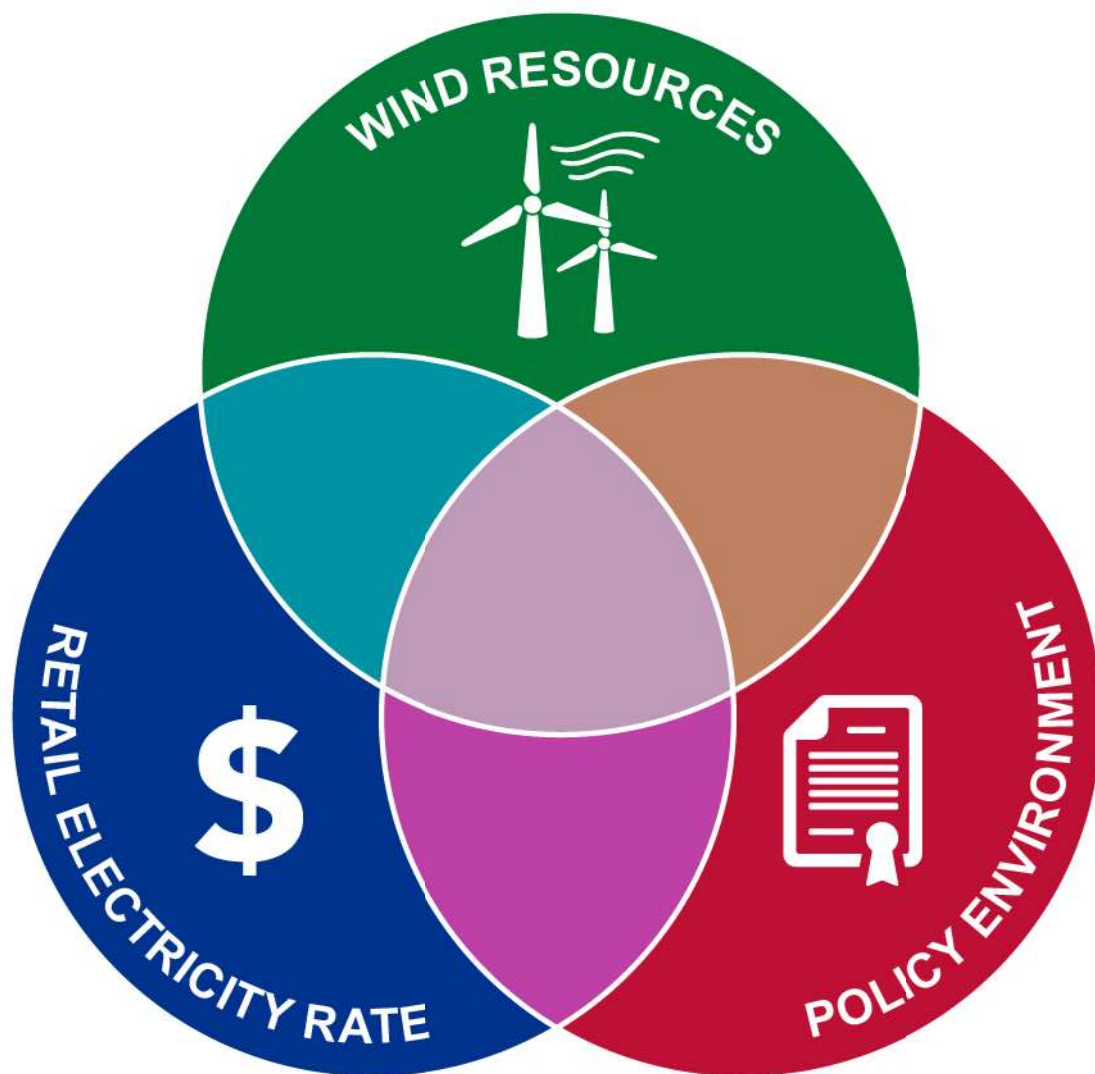
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Key Factors for a Distributed Wind Market



Cash Incentives



Interconnection



Net metering



Tax Credits

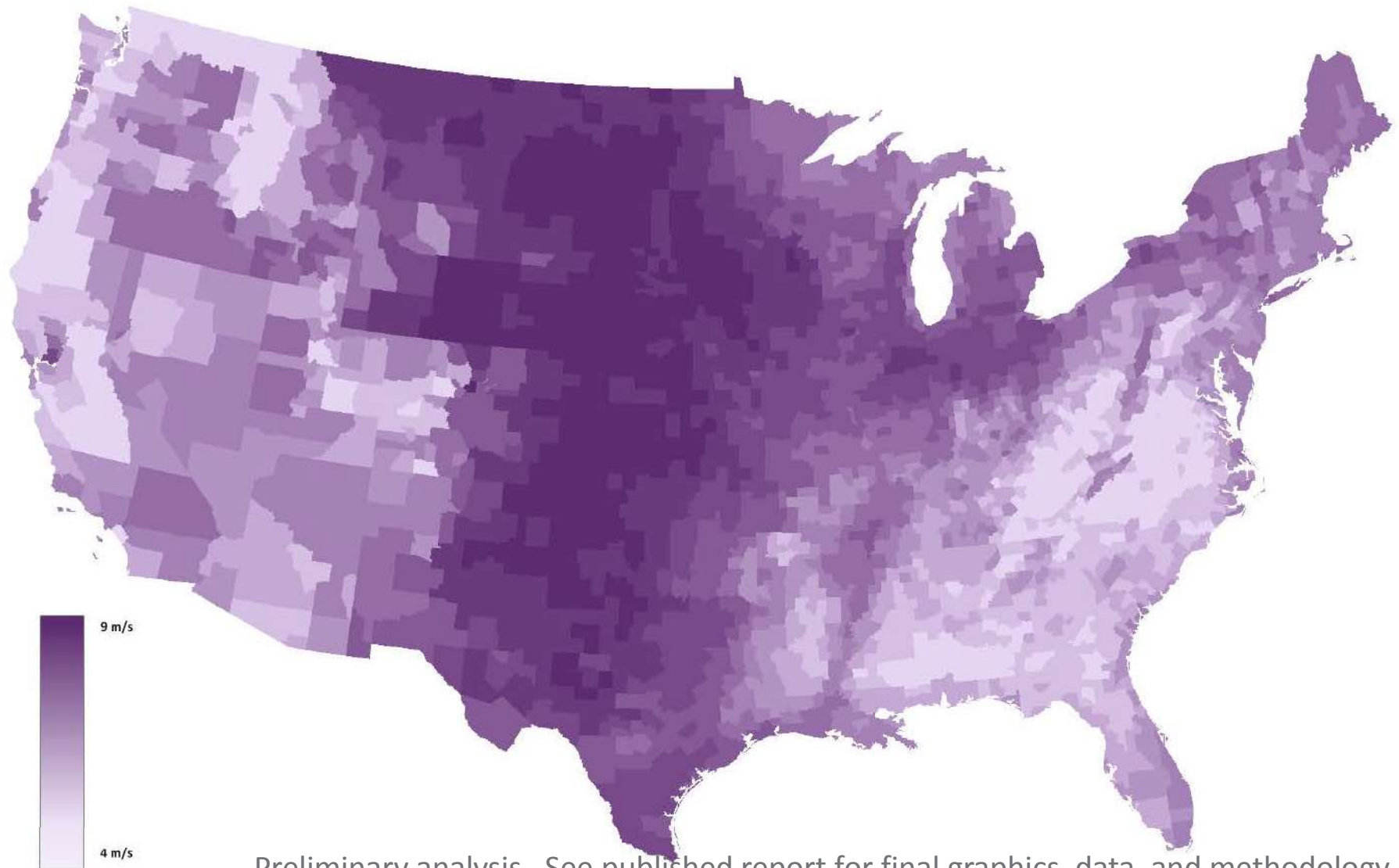
Key Factor

Wind Resource



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Preliminary analysis. See published report for final graphics, data, and methodology.

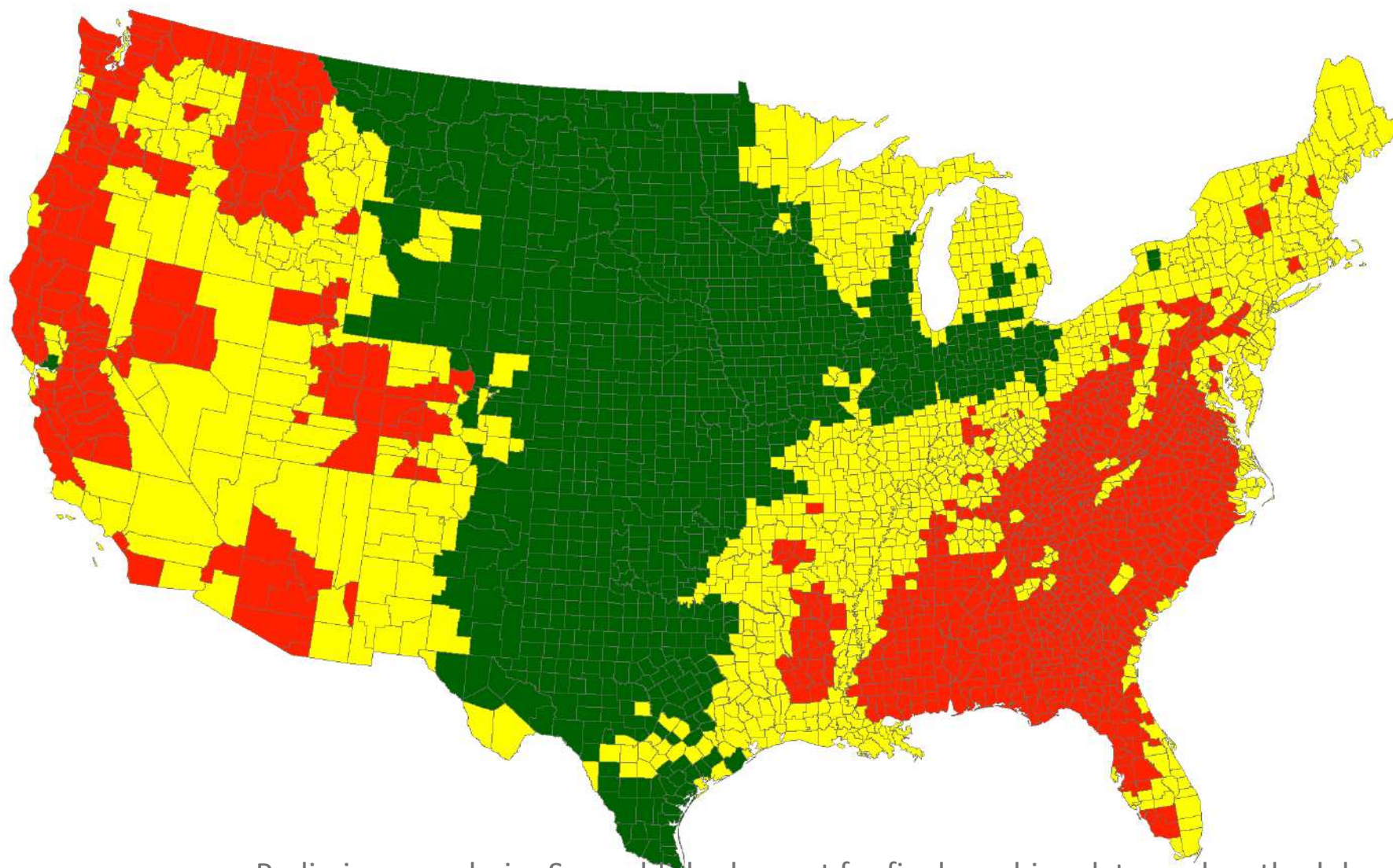
Key Factor

Wind Resource



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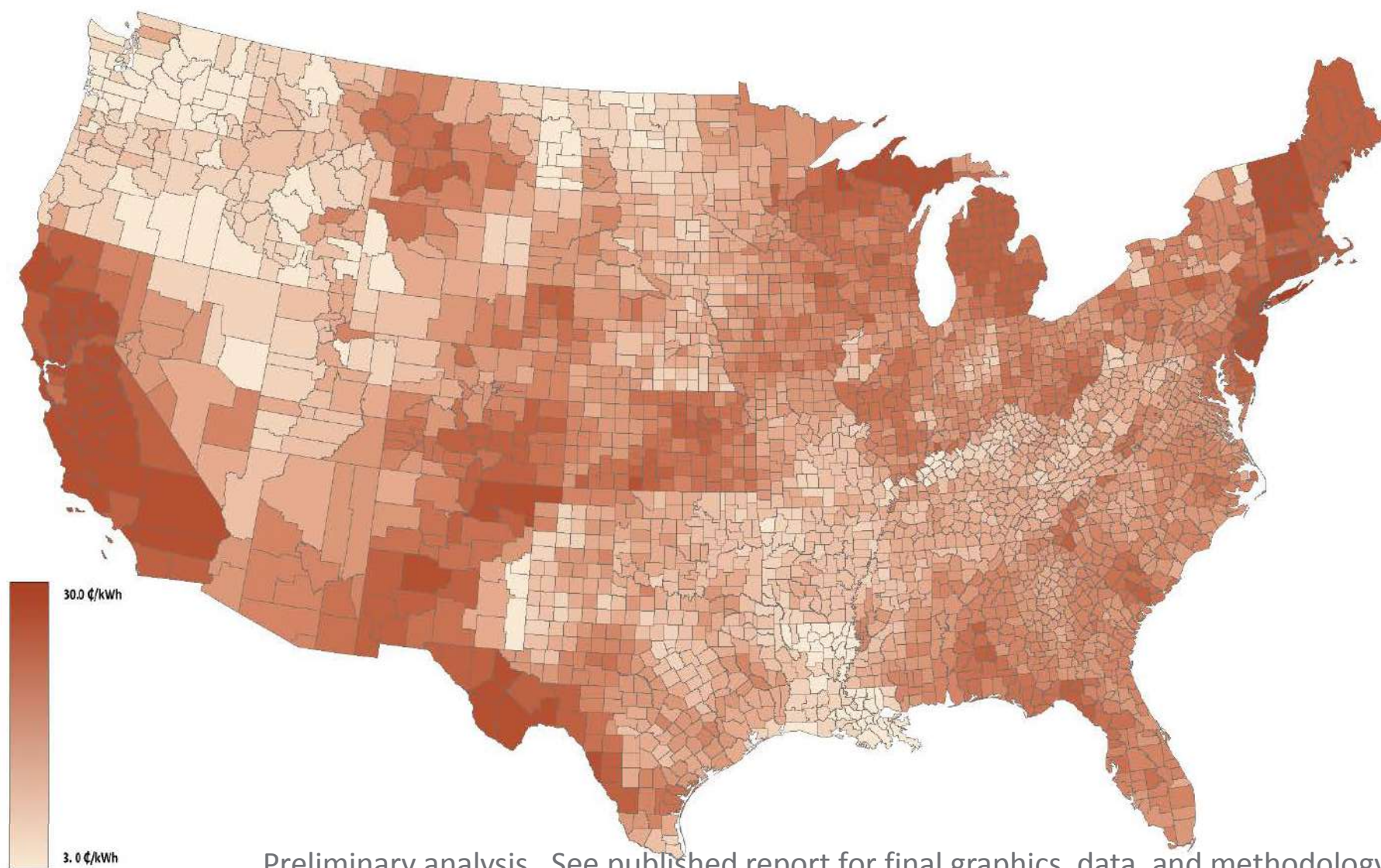
Key Factor

Retail Electricity Rate



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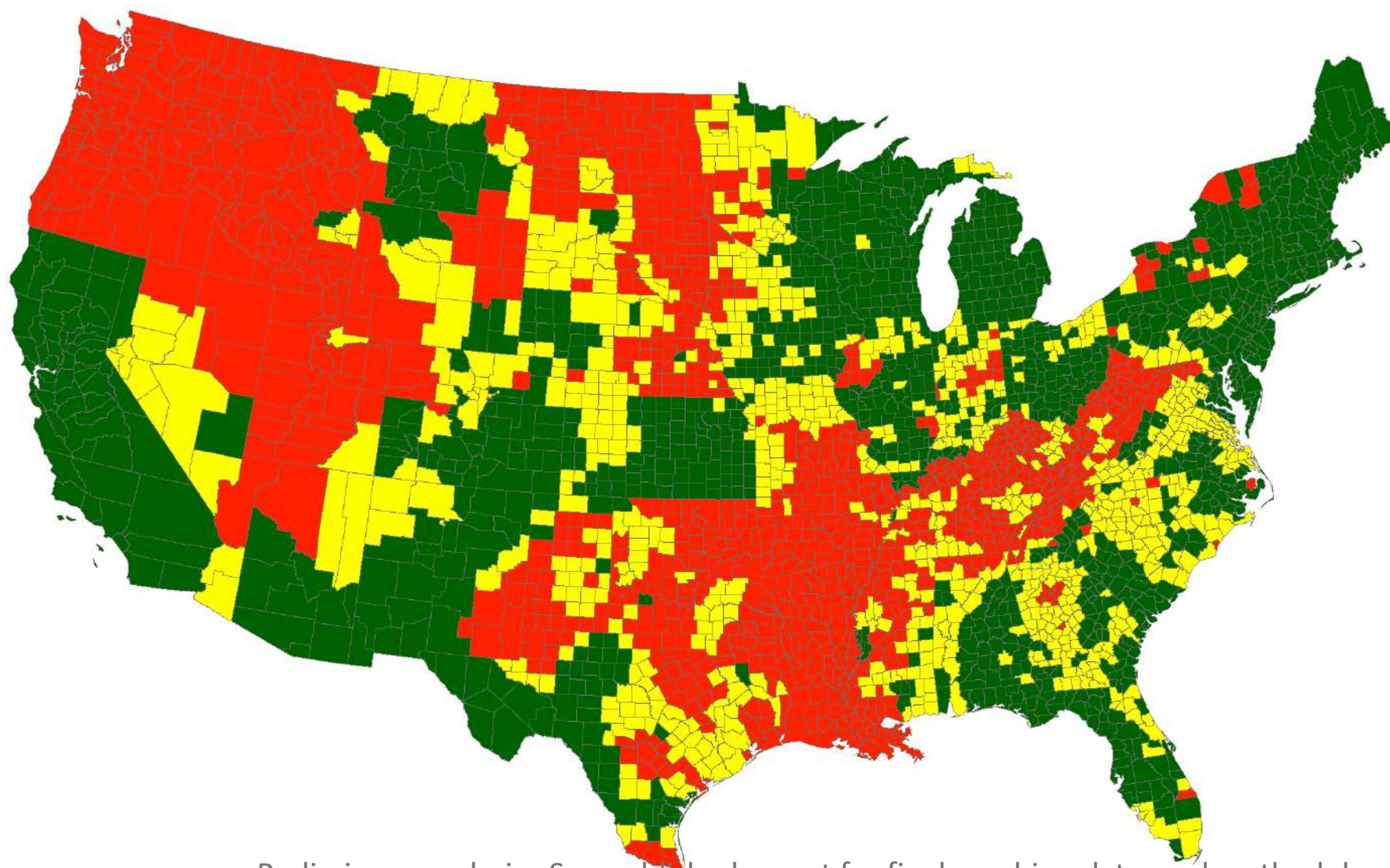
Key Factor

Retail Electricity Rate



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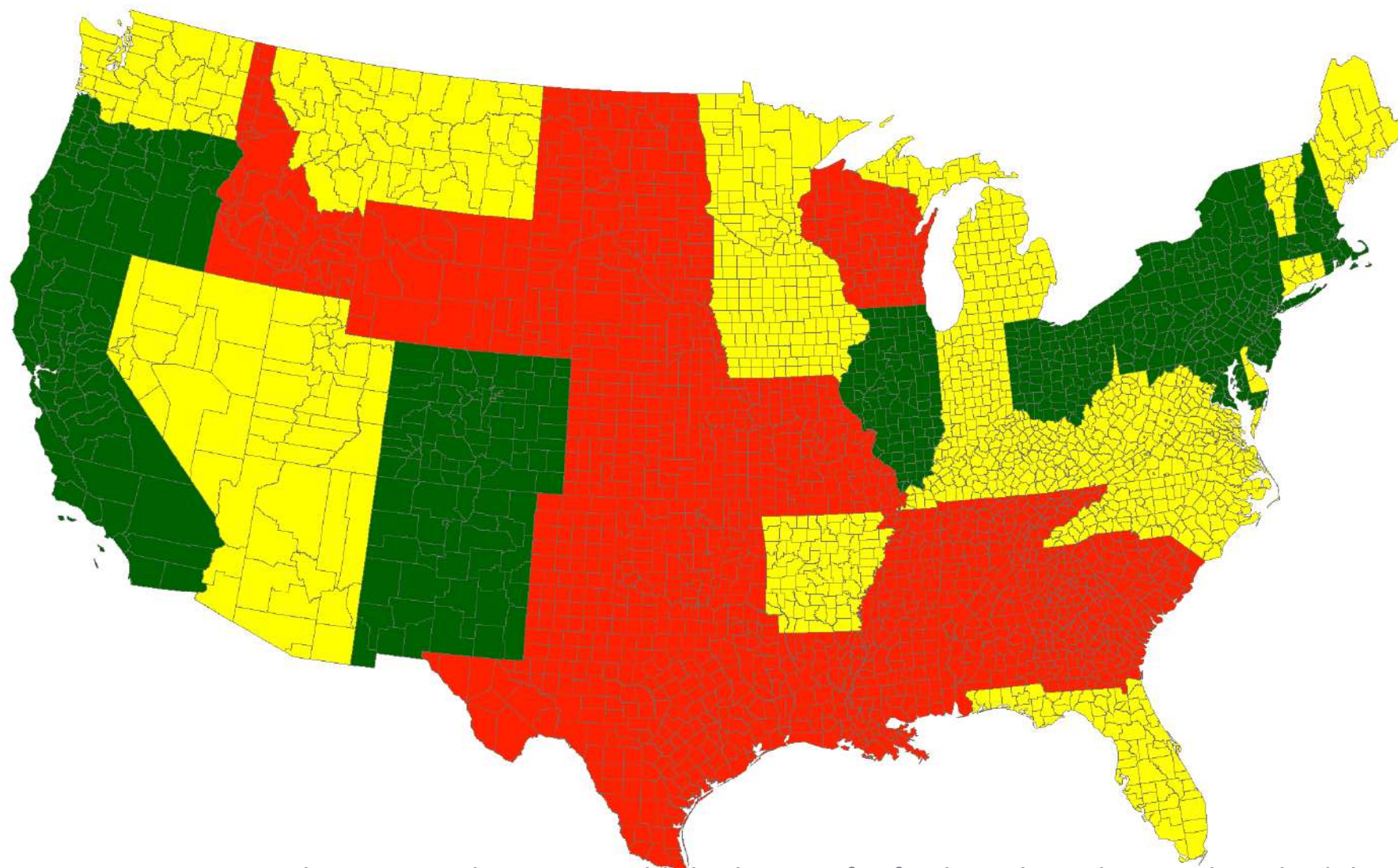
Key Factor

Policy Environment



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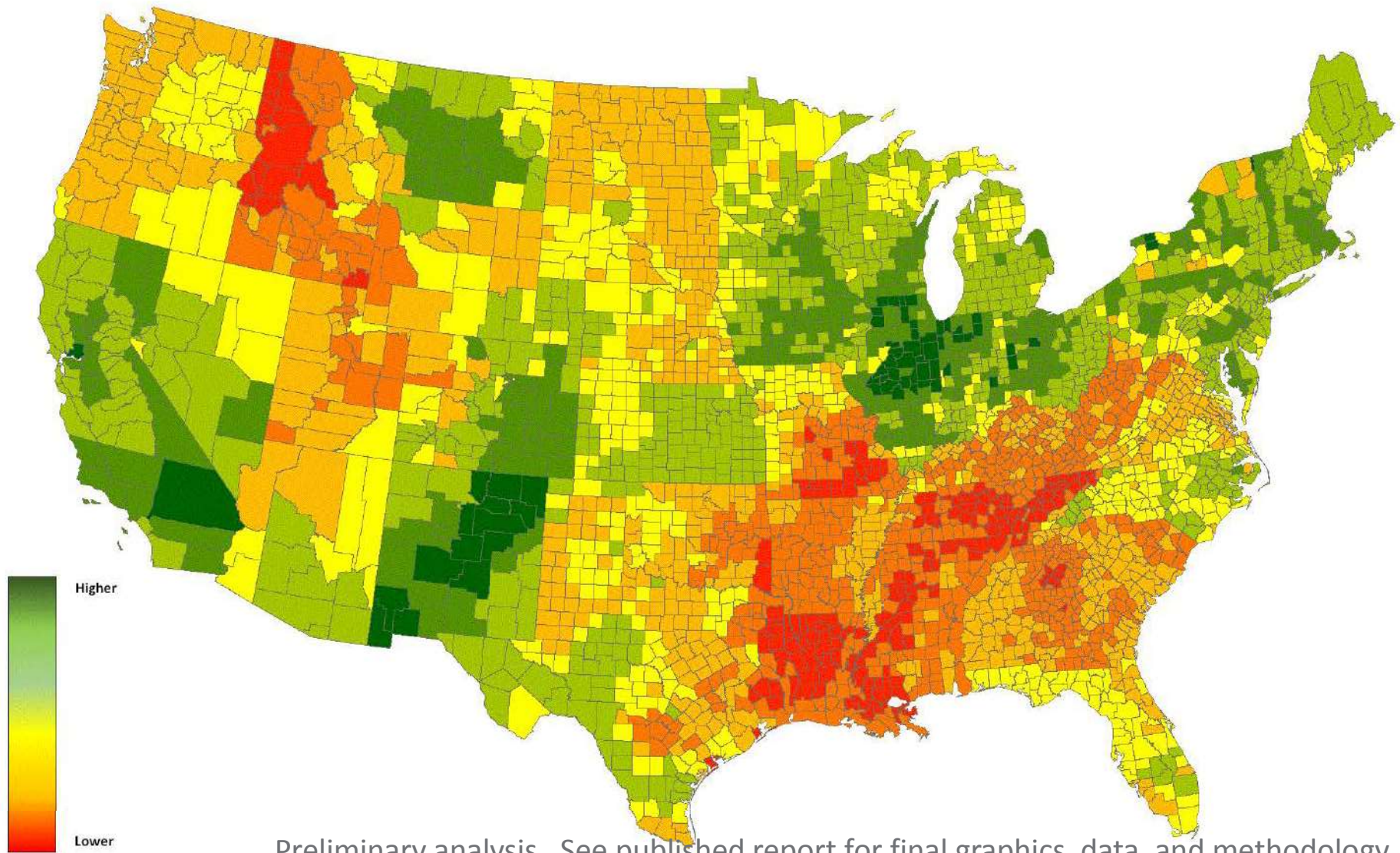
Key Factors

Where do these three factors meet?



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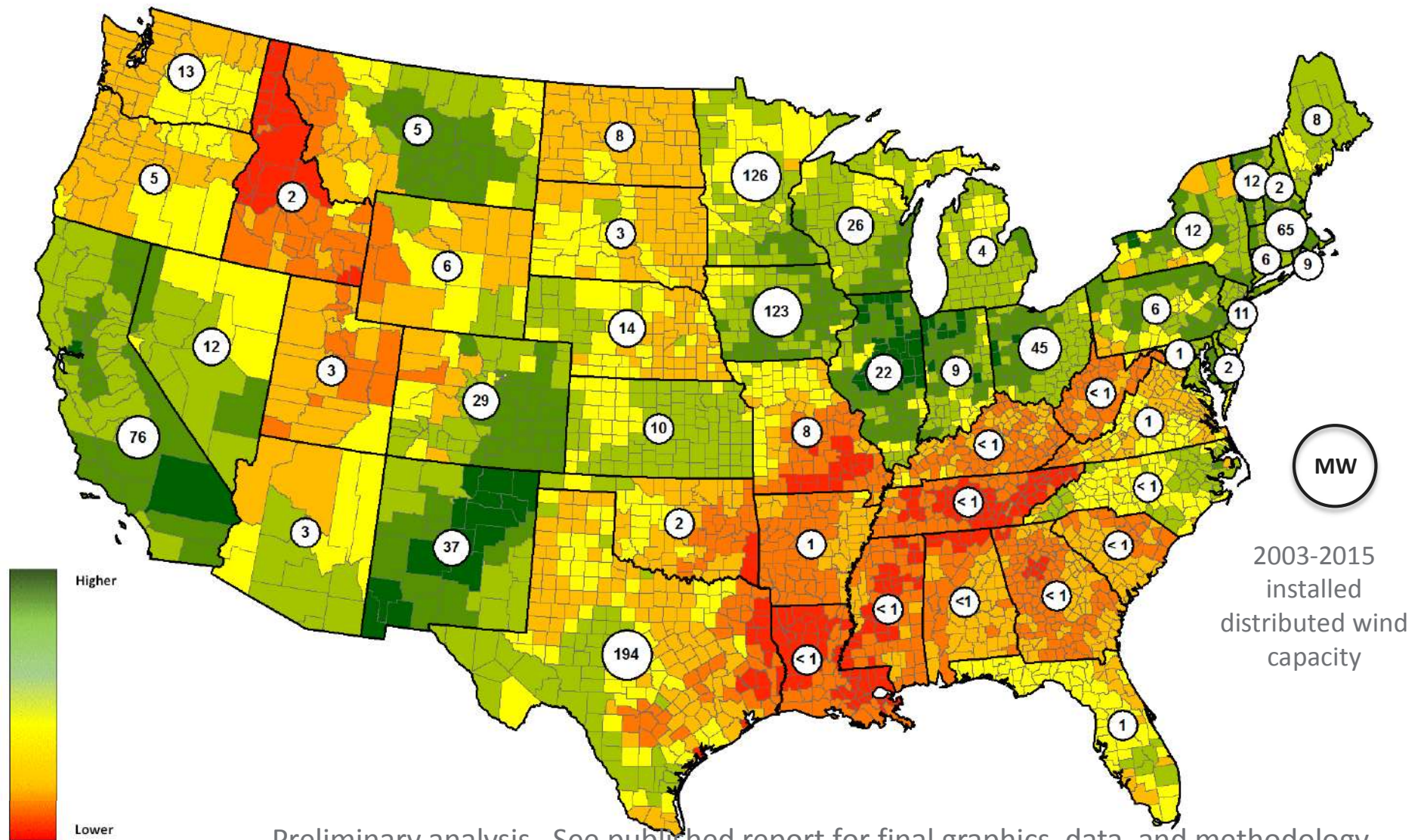
Key Factors

Where do these three factors meet?



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Thank you



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<http://wind.pnnl.gov/distributedwind.asp>



Pika Puffin turbine



Roger Dixon, Bergey turbine



Getting to 30 GW by 2030

Scott Sklar, The Stella Group Ltd.



The Stella Group, Ltd.

The Stella Group, Ltd.. is a technology optimization and strategic policy firm for clean distributed energy users and companies which include advanced batteries and controls, energy efficiency, fuel cells, geo-exchange, heat engines, microhydropower, modular biomass, photovoltaics, small wind, and solar thermal (including daylighting, water heating, industrial preheat, building air-conditioning, and electric power generation). The Stella Group, Ltd. blends distributed energy technologies, aggregates financing (including leasing), with a focus on system standardization. Scott Sklar serves as Steering Committee Chair of the Sustainable Energy Coalition, composed of the renewable energy and energy efficiency trade associations and analytical groups, and sits on the national Boards of Directors of the non-profit Business Council for Sustainable Energy, Renewable and The Solar Foundation, and is an Adjunct Professor teaching two unique interdisciplinary courses at The George Washington University, and sits on the USDOC efficiency and renewable energy advisory committee.

The Stella Group, Ltd. 1616 H Street, NW, 10th fl Washington, DC 20006
202-347-2214 (f-2215) www.TheStellaGroupLtd.com solarsklar@aol.com

DWEA: OUTREACH & ADVOCACY BUILDING

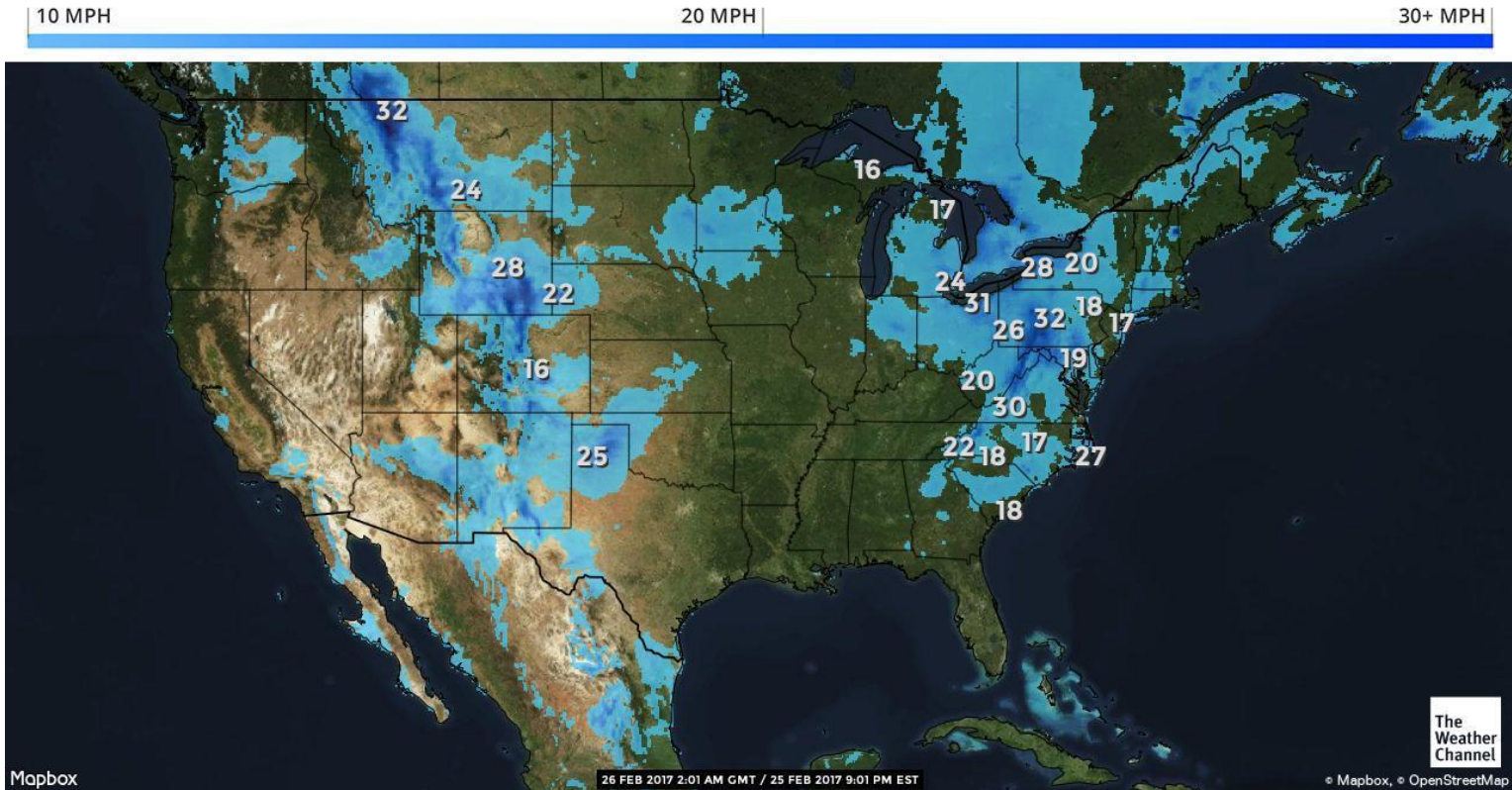
**NOBODY CAN LOVE YOU – IF THEY DON'T
KNOW WHO YOU ARE**

by SCOTT SKLAR



CURRENT WIND SPEEDS - GUSTS INDICATED

SATURDAY FEB 25, 2017



<http://hint.fm/wind/>

<https://earth.nullschool.net/>

<https://www.windytv.com/?38.886,-77.097,5>

DRIVING POINTS –

1. WIND IS EVERYWHERE and A FREE RESOURCE
2. CONTROL OF YOUR OWN ENERGY
3. RENEWABLE and NO WASTES or WATER
4. SOPHISTICATED, SNAZY, HIGH TECH, ELEGANT
5. SMALL MEANS AFFORDABLE
6. BATTERY STORAGE HAS FALLEN 60% IN COSTS & FALLING
7. DEDICATED ELECTRIC LOADS – TELECOM, WIFI, SECURITY,
LED LIGHTING, LAPTOPS/CELL PHONES
8. EASILY INTEGRATED WITH OTHER RENEWABLES – SOLAR.
MICRO/PICO HYDROPOWER, BIOGAS, & BATTERIES

LOCAL MEDIA –

BACKGROUNDEERS (STATS)

INSTALLATIONS

MANUFACTURING OR INSTALL COMPANIES (JOBS)

VALUE (previous slide)

TRENDS (next slide)

SOPHISTICATION OF TECHNOLOGY

PRACTICALITY

TRENDS

ENERGY IS BECOMING DISTRIBUTED and CLOSER
TO CONSUMER (RATEPAYER)

ENERGY IS BECOMING INTEGRATED – MICROGRIDS,
COMMUNITY POWER, NET-ZERO FACILITIES
& HOMES, INFRASTRUCTURE, REMOTE POWER

SMALL WIND IS BECOMING MORE SOPHISTICATED – NOT
WINDMILLS OF THE PAST or PINWHEELS

DIGITAL AGE IS DRIVING ELECTRIC LOADS TO BECOME
SMALLER – LEDS (-80%), REFRIGERATORS (-60%),
ON-SITE WIFI, CELLULAR, SECURITY (IN WATTS
RATHER THAN KWs)

STATE and LOCAL GOVERNMENT

1. COUNTY & STATE REPUBLICAN & DEMOCRATIC CHAIRMEN

2. COUNTY/CITY CHAMBER OF COMMERCE (find allies)

3. LOCAL NEWSPAPER & RADIO STATION

4. NGO's – VISIT and PRESENT

AMERICAN LUNG ASSOCIATION

LOCAL AIA (architects chapter)

VETERANS (VFW, American Legion, etc)

SERVICE CLUBS (Kiwanis, Lions, Rotary, etc)

ENVIRONMENTAL GROUPS – Sierra Club, Audubon Society,
NRDC, Environmental America, Greenpeace, etc.

5. EVENTS

MAKERS (inventors), EARTH DAY, SUN DAY, SCIENCE

FAIRS, NATIONAL SOLAR HOME TOUR (ASES),

LINK INTO VETERANS DAY, PRESIDENTS DAY, etc.

EPISODE PLANNING –

ELECTRIC OUTAGES – radio call in, newsletters

HIGH WIND EVENTS – commandeer the issue

LOCAL INSTALLATIONS – web press briefing

LOCAL – vocational, community colleges, technical schools, science high schools, colleges, and universities - lecture, events, and interact with faculty, assist with curricula aides

SIGNAGE and WEBSITES – businesses, installations – let people know what they are seeing

ASK EVERY DISTRUBUTOR & DEALER –
(\$100 savings bond))

- support high school essay contest
on some issue of small wind
- support junior high school arts contest
- drive time (AM) wind fact on morning radio
15 second “wind fact”
- sustainable, ongoing internship program
- move a portable wind turbine around – school. VFW,
service club meeting, or some advanced business
day

MAKE SURE YOU SEND MONTHLY- UPDATES on STATS
and INSTALLATIONS ON SMALL WIND and YOUR
COMPANY TO:

- state Christian Coalition
- state Tea Party
- state environmental groups
- state US Congressional representative and state legislature
leaders and mayors and county executives
- governor's economic development office

THERE IS NEVER A DUMB QUESTION

solarsklar@aol.com



Distributed Wind 2017