



15TH ANNUAL
Nebraska
Wind & Solar
CONFERENCE & EXHIBITION
October 25-26, 2022 | Lincoln, NE

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ENERGY
RESOURCES

Welcome to the 15th Annual
Nebraska Wind & Solar
Conference

Growing New Metering Opportunities

Jeff Berggren, *Valley Irrigation*
Tim Chancellor, *Thomas Livestock*
Michael Shonka, *Solar Heat and Electric*

Moderator: David Bracht, *Kutak Rock*



A **valmont**  COMPANY

Solar in Nebraska – Net Metering

Nebraska Wind & Solar



Valley & Valmont Background

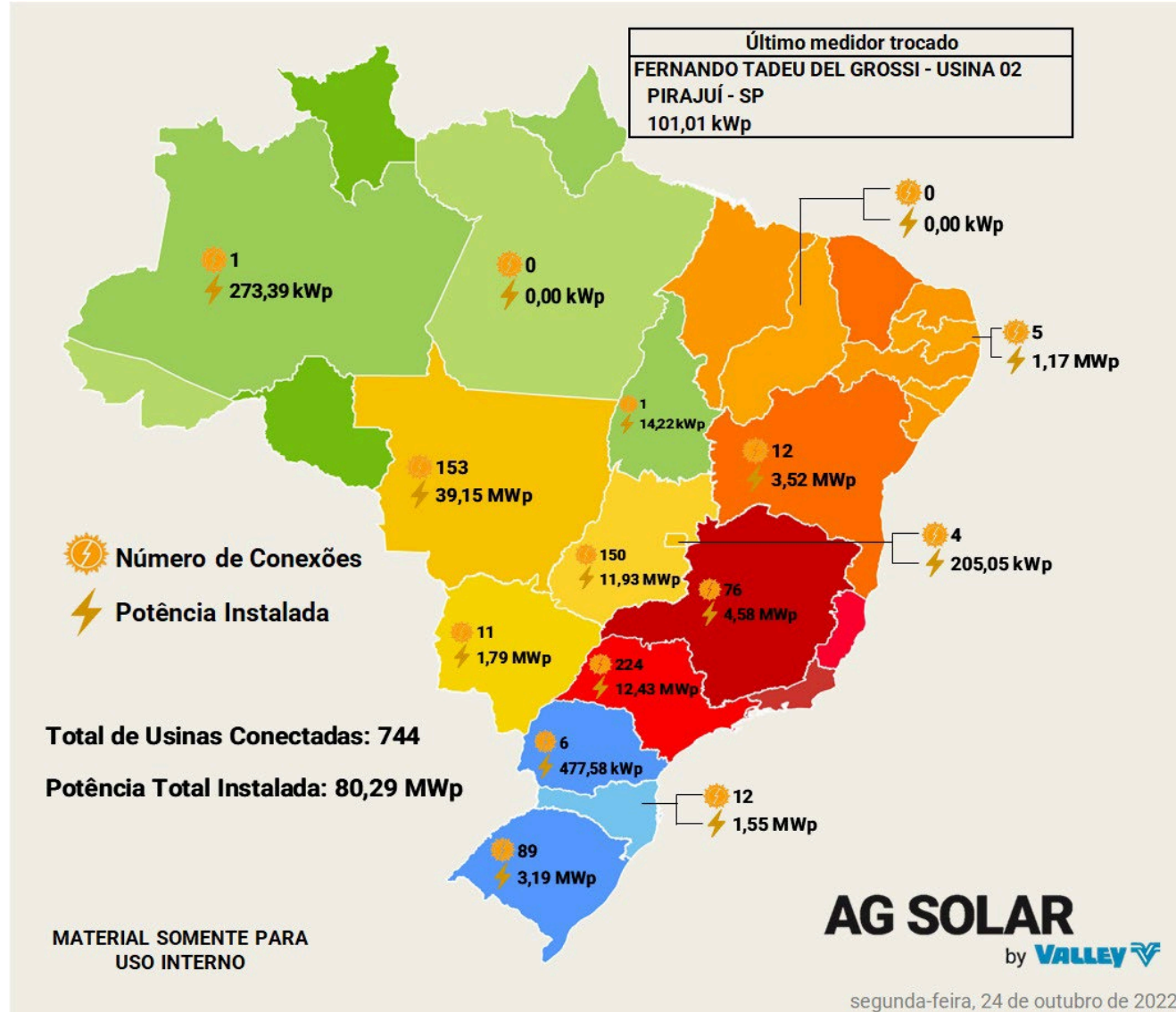
- Founded in 1959
- Division of Valmont (Valley & Fremont)
- Valmont Produces a multitude of products worldwide
 - Substations
 - Light and utility poles
 - Galvanized metal products
 - Solar Trackers
- Valmont Headquarters Located in Omaha
- Manufacturing locations throughout Nebraska from Valley to McCook



Solar Solutions by Valley

- Solar division is the new Valmont entity
- Begun in Brazil with the partnership with Energia Solar do Brasi (Sol Bras)
- Purchased majority stake of Sol Bras in 2020
- Solar sales increased exponentially in Brazil
- Expansion to other markets worldwide
 - Africa
 - Europe
 - Middle East
- GWs installed worldwide

Solar Solutions by Valley





Solar Solutions by Valley

- The US and Canada are next
- Over 200 Valley Irrigation Dealers in North America
- 40 in Nebraska
- Offering training and turn-key solutions for the dealers
- Brand Recognition
 - Parts for 50 year old products
 - Innovation
 - Customer driven



Solar Solutions by Valley

- Projects in IL, NV, WA, FL, and Canada
- Projects range in size from 25kW to 2MW
- One 25kW in Nebraska
- States vs Utilities
- Ease of Adoption
 - Online Interconnect Agreements
 - Permitting Process
 - High Net-Metering Caps
 - State or Province Incentives
 - REC Markets (IL)



Solar Solutions by Valley

- Challenges in Nebraska
 - 150+ Utility Entities
 - No Standard Interconnect Agreement
 - Outdated Equipment
 - Insurance Requirements
 - Utility Response Times
 - 25kW Cap



Solar Solutions by Valley

- Resolutions
 - Nebraska is home state
 - Early adopters are often right here
 - Work with legislators
 - Trade organization

Net Metering In Nebraska: Policy, Compliance and Economic Benefits

**Nebraska Wind and Solar Conference
October 2022**

**Michael Shonka
Solar Heat and Electric**

Highlights of Current Net Metering Law (LB 436 - 2009)

Why is Net Metering so Important to
Nebraska's Economy: Equal Compliance

Vision of What We Really Need

Highlights of Current Net Metering Law

- really simple and direct
- uses retail rate (calcs in kwh)
- customers may not be charged a different fee / rate
- compensated at avoided cost
(flexible but not transparent)
- less than zero carries over until trued up
at end of year

Highlights of Current Net Metering Law

- utility pays for two-way meter
- may not require additional standards or charges for equipment, tests or services
- may not require liability insurance
- local districts may raise net metering limit above 25 kw (and add incentives)

Drawbacks of Current Net Metering Law

- intended for use onsite and cannot be applied remotely or aggregated
- low rated capacity of 25 kw (needed to be spelled out as AC limit for some folks)
- utility may stop net metering when it reaches 1% of aggregate customer peak demand

Drawbacks of Current Net Metering Law

- NO Penalty Box for Noncompliance

Some districts still do not embrace solar.

Typical issues:

- parsing out different meter types or voltages
- requiring liability insurance
- monthly true-up on billing over-production
- add large-scale solar towards net metering limit

Why is Net Metering so Important

- Energy is produced, but cannot be used so it goes back into the “Grid Battery of the Common Good”
- The excess energy rolls forward to annual true-up
- **Without Net Metering - most solar is uneconomic**
- **Without Net Metering;**
our Nebraska economy is less globally competitive
- We need solar and storage to meet future demand

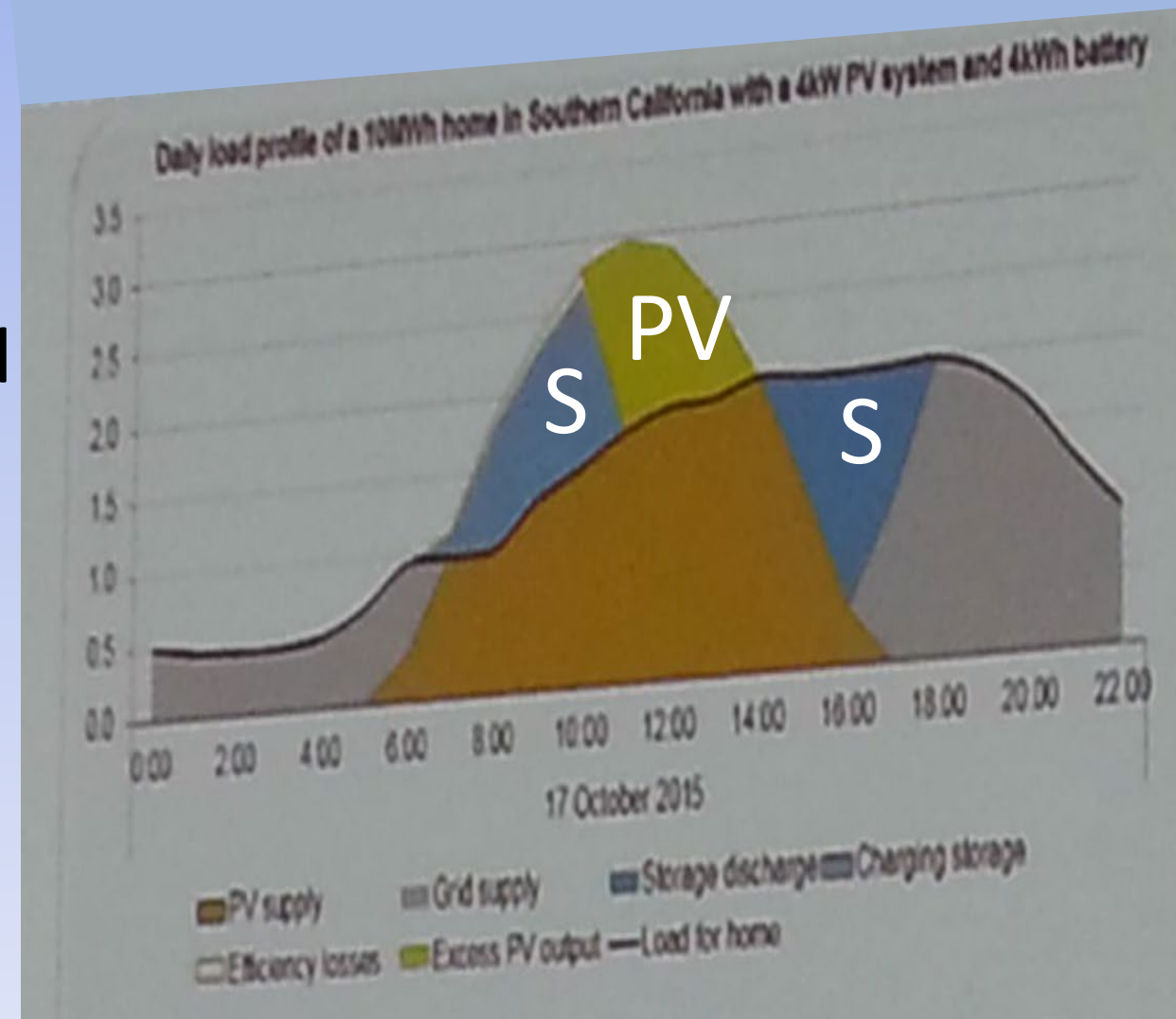
Net Metering Encourages Capital Investment

- Every home, farm or business with solar adds generation capacity to the grid
- As solar builds out - storage is needed to absorb excess energy
- Storage will need to be strategically located to build the grid of the future
- The grid will evolve with two-way substations to create microgrids (similar to telco fiber loops)

Daily Load Profile of a Typical Home

PV and Storage reduce the total demand (black line)

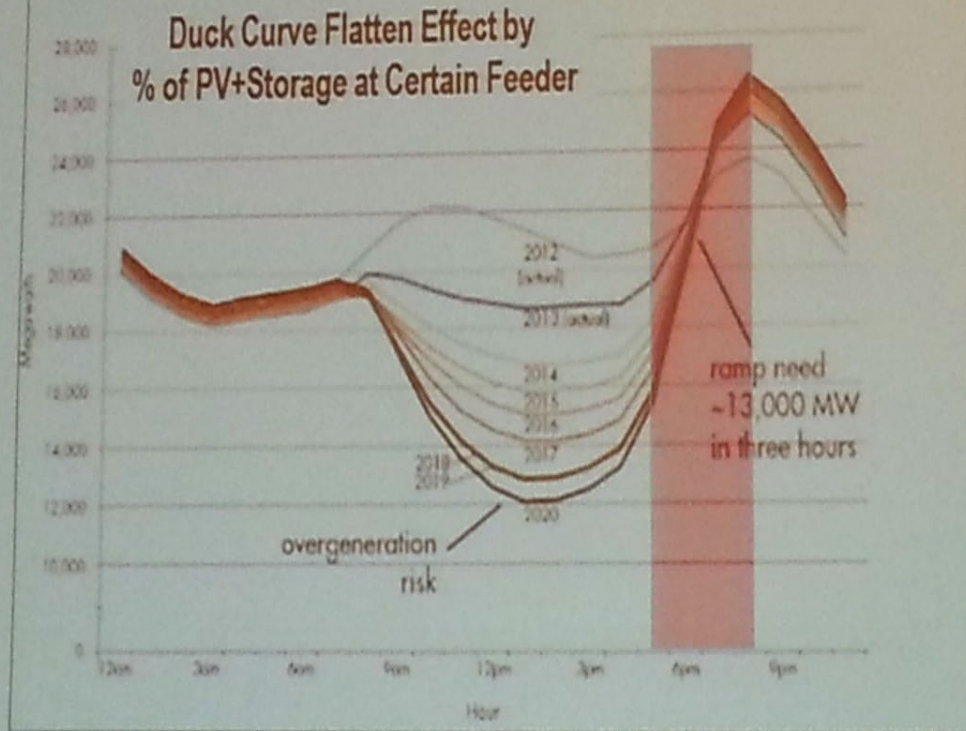
Helps stabilize the grid



As the **PV** Solar drops off in the late afternoon, the **Storage** adds energy reducing demand

Batteries flatten the "Duck" curve

Figure 2: The duck curve shows steep ramping needs and overgeneration risk



PV+Battery at Residential Will help flatten Duck Curve Significantly

Vision of the Public Grid and Solar

- Public Power must stay in the middle of the customer-owner's transition to renewables
- The 20-year loans for many new solar installations means many millions of lost revenue for Public Power
- Public Power could bond finance solar loans through credit unions / banks as a revolving fund
- Payments could be made to financial institutions or on the utility bills

Vision of the Public Grid and Solar

- Virtual and aggregated metering would provide for common locations of solar arrays that could be under Public Power control / maintenance
- Engineering reviews where to place smaller scale solar systems which could be precursors to community solar projects
- Strategic location of storage and two-way distribution capability enables evolution to microgrids

We are at a fork in road: Trajectories for Electric Grid Evolution

Path 1: Integrated Grid

One path leads to grid-optimized smart solar, transactive solar-plus-battery systems, and ultimately, an integrated, optimized grid in which customer-sited DERs such as solar PV and batteries contribute value and services alongside traditional grid assets.

Pricing & Rate Reform
New Business Models
New Regulatory Models

EXPORT COMP. (NEW, FIT, HIST) • TOU PRICING • LOCATIONAL HOT SPOTS • ATTRIBUTE-BASED PRICING
• NRG • E.ON • RWE • CH2M BOCOM
• PERFORMANCE-BASED REGULATION • NY REV • CA MORE THAN SMART • ENERGIEWERKE

Solar PV and batteries play an important role in the future electricity grid, but decisions made today will encourage vastly different outcomes.

Path 2: Grid Defection

Other path favors non-exporting solar PV, behind-the-meter solar-plus-battery systems, and ultimately, a fragmented grid resulting in an overbuilt system with excess capital and stranded assets on both sides of the meter.

NO EXPORT PRICING • FIXED CHARGES
• CENTRAL GENERATION
• VERTICALLY INTEGRATED UTILITIES
• STRANDED ASSETS

GRID
DEFLECTION



2015 Solar
Product
of the Year
for Europe:
Integrated
Inverter
and
Storage

Why Solar Power Doesn't Threaten Electric Utilities

Some claim that huge swaths of people can install panels on their roofs and unplug from the grid. They're wrong.

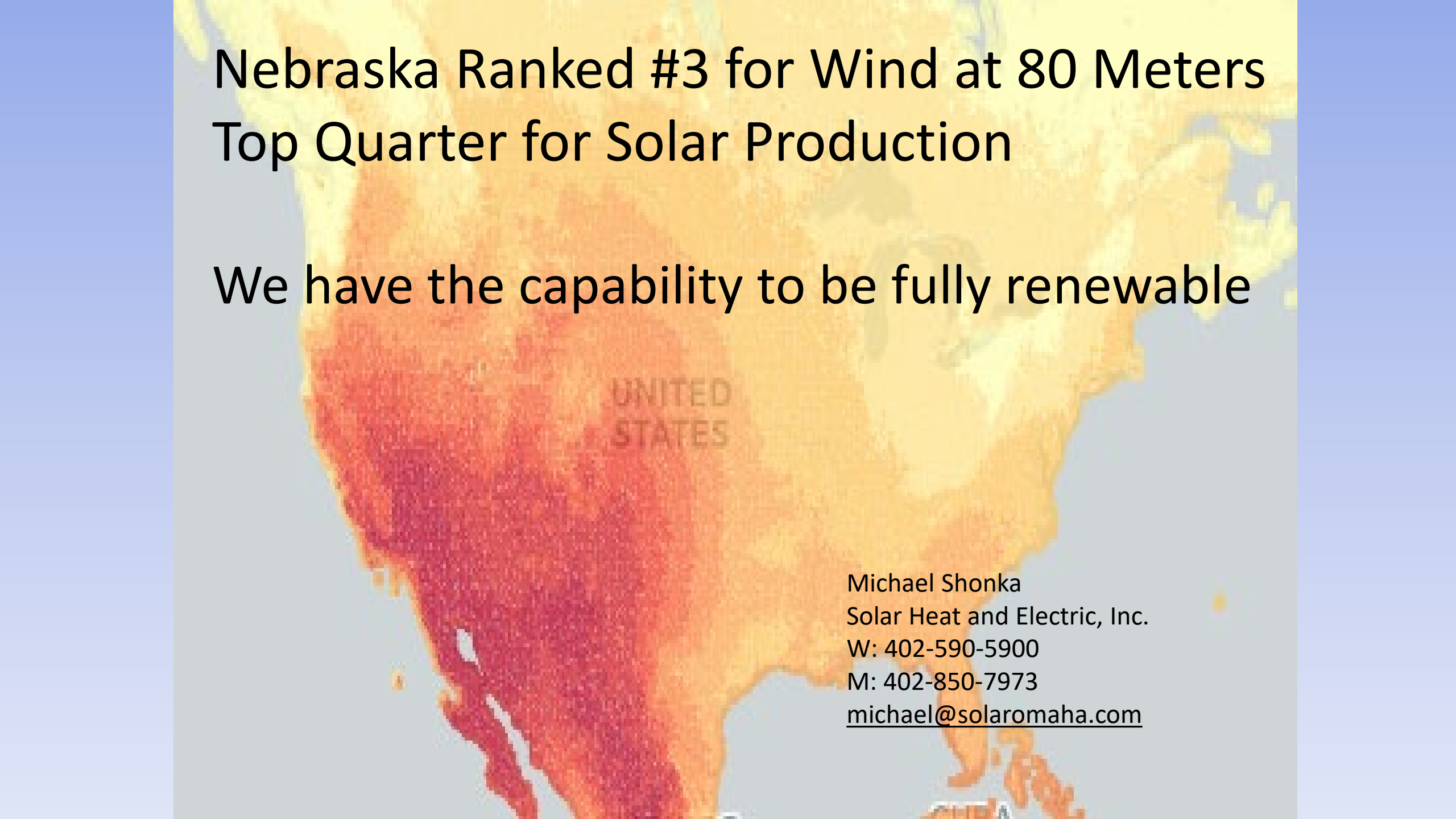
By Eric Hittinger

<http://www.slate.com/articles/>

Don't Lose the Big Picture

Nebraska **imports** 95% of its energy...
we **export** up to 95¢ of every energy dollar

We need to adopt state policies that leverage
Public Power and private capital to move the needle



Nebraska Ranked #3 for Wind at 80 Meters Top Quarter for Solar Production

We have the capability to be fully renewable

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The Difference Between Net Metering or Not

Solar Electric System owners (homes, businesses, farms, schools, etc.) have net metering available to them in both Iowa and Nebraska. Although the details vary somewhat, the policy of net metering is to subtract the energy generated by the solar system from the utility energy consumed. The difference owed to the utility is paid every month per usual billing.

If the solar system owner generates excess energy (measured in kilowatt hours or kwh), the difference is carried over to the next month until consumed or until the end of the 12 month billing cycle when the utility cashes out the account. In Nebraska, the net metering limit is 25 kW per meter (25,000 Watts is about an 80' rack of modules). In Iowa the net metering limit is 250 kW.

There are other stipulations, such as not requiring liability insurance, that are in the state law. The Nebraska version can be accessed at : [NE Code § 70-2005 \(2019\)](#)

When the law was passed in 2009 (with the generous support of Public Power Districts across the state) there was a concern that the impact of solar on the public power network was unknown. An upper limit of 1% of capacity (or 3% of peak demand) was set as a conservative safety factor. Some Districts have approached or reached this limit and have enacted a moratorium on net metering for new solar owners.

The impact of no net metering will generally reduce system sizes for smaller loads (such as homes) so the systems are still economically viable. The characteristics of energy demand is generally sporadic (i.e., the air conditioner intermittently coming on creates a variable load). The solar system is a more constant energy generator. Without net metering, the energy not instantly consumed will be credited at the wholesale rate (usually ~ 4¢) instead of counting against the monthly bill in kwh.

The difference between net metering or not - is significant.

Based on an actual utility bill... the cost with net metering;

1812 kwh consumed costs \$176.33 (or \$0.0973 per kwh)

873 kwh solar generation credit

939 kwh is the net difference between consumed and credited in kwh which would cost \$91.38

The same bill without net metering is credited using the wholesale rate of reimbursement;

1812 kwh consumed costs \$176.33

873 kwh solar generation earns a credit of \$39.31 [or \$0.0450 per kwh (less than half of the retail rate)]

The total without net metering is \$215.64.

The value of the solar generation of 873 kwh is \$39.31 without net metering or \$124.26 with net metering. In other words, in this example, net metering represents nearly a 70% savings.

This begs the question – why send any excess energy to the grid if the payback is so small? Keep in mind that electrical energy at different times of the day is worth more (excess demand on hot summer days) but these factors are not represented in the wholesale rate. The investment in a battery storage system to absorb the excess daytime production could be used for nighttime, as well as back-up power when the grid goes down.

Currently, the economics using battery storage are higher than the grid, but that gap will close as utility rates increase and technology improves. When, not if, the economics favor batteries, we could see some grid defection as people invest in autonomous storage systems. The scale of that problem is a function of consumer attitudes towards their Public Power utility (presently very favorable by most). However, we have already seen the marketing of these systems by external agents that ultimately do not contribute to the greater good of the state's energy profile.

Public Power in Nebraska – Adjust to the Future or Involuntary Divestiture 3 of 4

- Michael Shonka

The entire power industry is changing in ways that are both disruptive and provide exceptional opportunities - the key is being able to set aside culture to read the tea leaves. In order to read the present, one must project a future. The problem with humans is their tendency to base future beliefs on past experience and with some industries that has disastrous results.

The power industry faces very similar issues that the telco industries faced in the 1983 Divestiture decision. Will Nebraska Public Power drag out the competitive pressures and lose revenue, like the telcos lost the entire residential Internet market to the cables because they could not get the Internet to fit into their "T-1" architecture? They continue today with trying to thwart Net Neutrality and parse it out for unequal revenue gains. The telcos residual battle with Net Neutrality is the Power Industry's gaming of the Net Metering statutes.

Monopoly behavior will always seek to define the edges of what is tolerable rather than innovate to success, it is just human nature. The problem is losing the Big Picture. If a rate structure barely allows for profitability in a solar system or attempts to dissuade it altogether - the downstream effect will be Nebraska's agriculture industry will become globally uncompetitive and industry (read investment) will be forced to move outside of the state... all in favor of preserving the rate structure.

The new market entrants in the 1980's and 90's easily found the weak links in the telco network. The highly structured telcos were using a defensive strategy, then offensive measures and in the meantime, lost precious time to innovate what their customers needed. New solar entrants have finally made it to Nebraska and the pickings are easy.

Their lead generation programs, honed from years of evolution in the digital marketplace, churn up appointments at predictable rates. Dispatching a cadre of young and eager solar newbies, trained in the company jargon and schooled in their sales objection management techniques, roll up a close rate north of 30%. Within a few, very short years, the trickle of revenue attrition will be tsunami. These 20-year commitments of no money down and a lifetime to pay will suck millions annually off the top of the resi market and transplant it to out of state companies. Nebraska's energy deficit will be a root cause of social problems to come - higher property taxes, breakdown of social goods provided under the umbrella of Public Power, reduced economic development, and similar secondary or tertiary fallout issues.

The danger is real - the time is now. The action taken must be immediate, decisive, flexible and comprehensive. The answers will not be found within, as the telco industry discovered too late.

Public Power is Nebraska's best lever to spring from status quo of exporting our energy capital because we are not a carbon-based state. We import 95% of our energy resources, creating a tremendous imbalance of trade payments. We do not have coal, oil or methane to supply our energy.

We do have wind, solar and a lot of husbandry to supply our local and state energy needs. These current technologies are easy to identify and can be promoted on a selective basis, especially to areas that need it most. Incentives for generation, coupled with programs to prefer local contractors, suppliers or technologies, will blunt the attrition. Economic leverage of Public Power needs to be creative and will become a model for other states with not just incentives, but bonds or green funds, tied with educational systems for training a new generation of energy workers. This input of fresh human capital will fashion the new worldview based on the solid foundation of today's Public Power leadership.

The future of Public Power in Nebraska will be microgrids of autonomous power entities making their own decisions often independent (but observed) of the control centers. The microgrids will take in power from families of solar inverters, wind and biomass generators, small hydro and other resources. The new electronics will allow functionality that is not currently possible or cost effective.

The sub-stations will be two-way, power host sites with storage. Transmission will still be the backbone, but serve with more flexibility. Control centers will evolve, as the mindsets that run them, with the usual data coming in from production / supply, weather, demand factors and a host of new sources based on inverters, wind fields, dispatchable digesters and about anything that creates an electron.

Today's issues center around policy developed by people whose mindset is sound for the market we were in. We are not in that market anymore. We need our people to evolve our policies to the market crashing in our borders. The telcos kept their rules and watched their market erode from monopoly to one of many. We need to innovate beyond our rules to include multiple aspects of our state's economy. To do so will keep the noble cause of public service within Public Power. Not to answer the siren's call will fracture Public Power to a fraction of its market integrity today, just ask a telco veteran.

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