

PREPARED FOR:

IWRC Webinar

PRESENTED BY:

Ideal Energy, LLC.

Troy Van Beek, CEO, Ideal Energy

Oct 7th, 2020







# Contents

---

ABOUT IDEAL ENERGY

APPLICATIONS OF ENERGY STORAGE

SOLAR & STORAGE PROJECTS

*Maharishi University of Management*

*Agri-Industrial Plastics Company*

FUTURE OPPORTUNITIES



# About Ideal Energy

---





# Ideal Energy

---

Ideal Energy is a Veteran-Owned, Iowa-based energy company, delivering quality solar and battery storage solutions to the Midwest & beyond.

Founded in 2009, Ideal Energy is Iowa's pioneering solar company. Our award winning solar installations, comprehensive portfolio, and outstanding customer service have made us a nationally recognized leader in the Midwest solar industry.

We believe that switching to solar should be easy. Our professionally trained solar team will walk you through the process with white glove service from beginning to end.





# AWARD WINNING SOLUTIONS



IOWA ENVIRONMENTAL COUNCIL  
BUSINESS INNOVATION  
AGRI-INDUSTRIAL PLASTICS



IOWA ENVIRONMENTAL COUNCIL  
BUSINESS INNOVATION  
IDEAL ENERGY



IOWA ENVIRONMENTAL COUNCIL  
PARTNER IN POLICY  
STEFFENSMEIER WELDING



SOLAR BUILDER  
PROJECT OF THE YEAR  
SCHOOL HOUSE APARTMENTS



1000 FRIENDS OF IOWA  
RENEWABLE ENERGY  
STUFF ETC



1000 FRIENDS OF IOWA  
RESIDENTIAL DEVELOPMENT  
SCHOOL HOUSE APARTMENTS

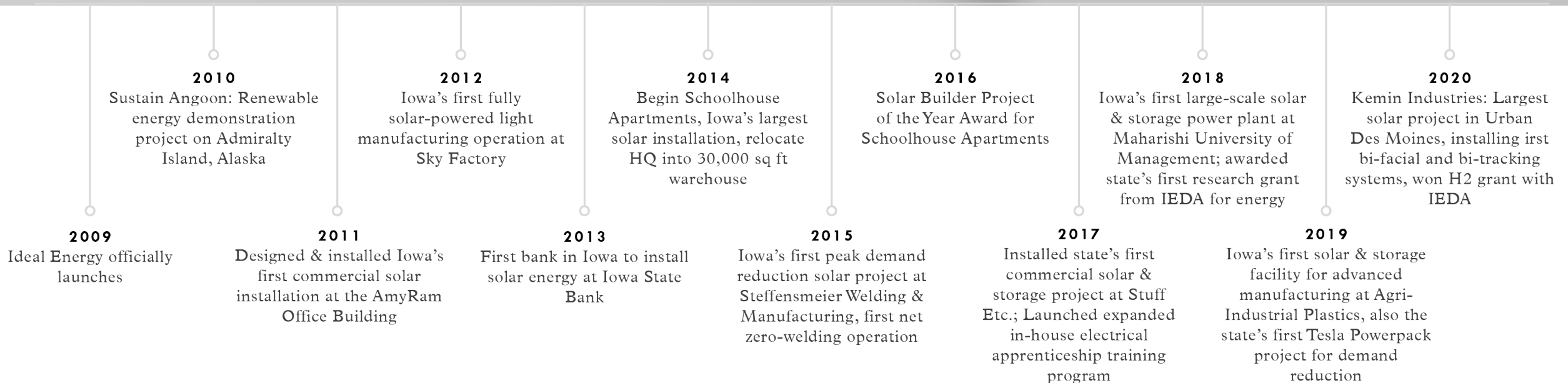


1000 FRIENDS OF IOWA  
RENEWABLE ENERGY  
STEFFENSMEIER SOLAR



CELEBRATING OVER A DECADE IN

# Industry Leadership





# Applications of Energy Storage

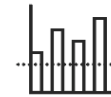
---





# Energy Storage

---



## PEAK SHAVING

Use stored energy during peak times to reduce or eliminate demand charges.



## LOAD SHIFTING

Shift energy usage by charging batteries on solar and discharging when electricity is more expensive.



## EMERGENCY BACKUP

Keep your operations running seamlessly during power outages.



## MICROGRIDS

Eliminate expensive generator usage and reduce interruptions from blackouts with continuous, reliable power.



## RENEWABLE INTEGRATION

Smooth the output of renewable power generation sources such as wind and solar.



## GRID SERVICES

Provide reserve capacity, frequency regulation, and voltage control to the grid.



# Solar & Storage Projects

---

# Maharishi University of Management





Maharishi University of Management

# Solar & Storage Power Plant

---

1.1 MW  
SOLAR ENERGY

1.05 MWh  
VANADIUM FLOW BATTERIES

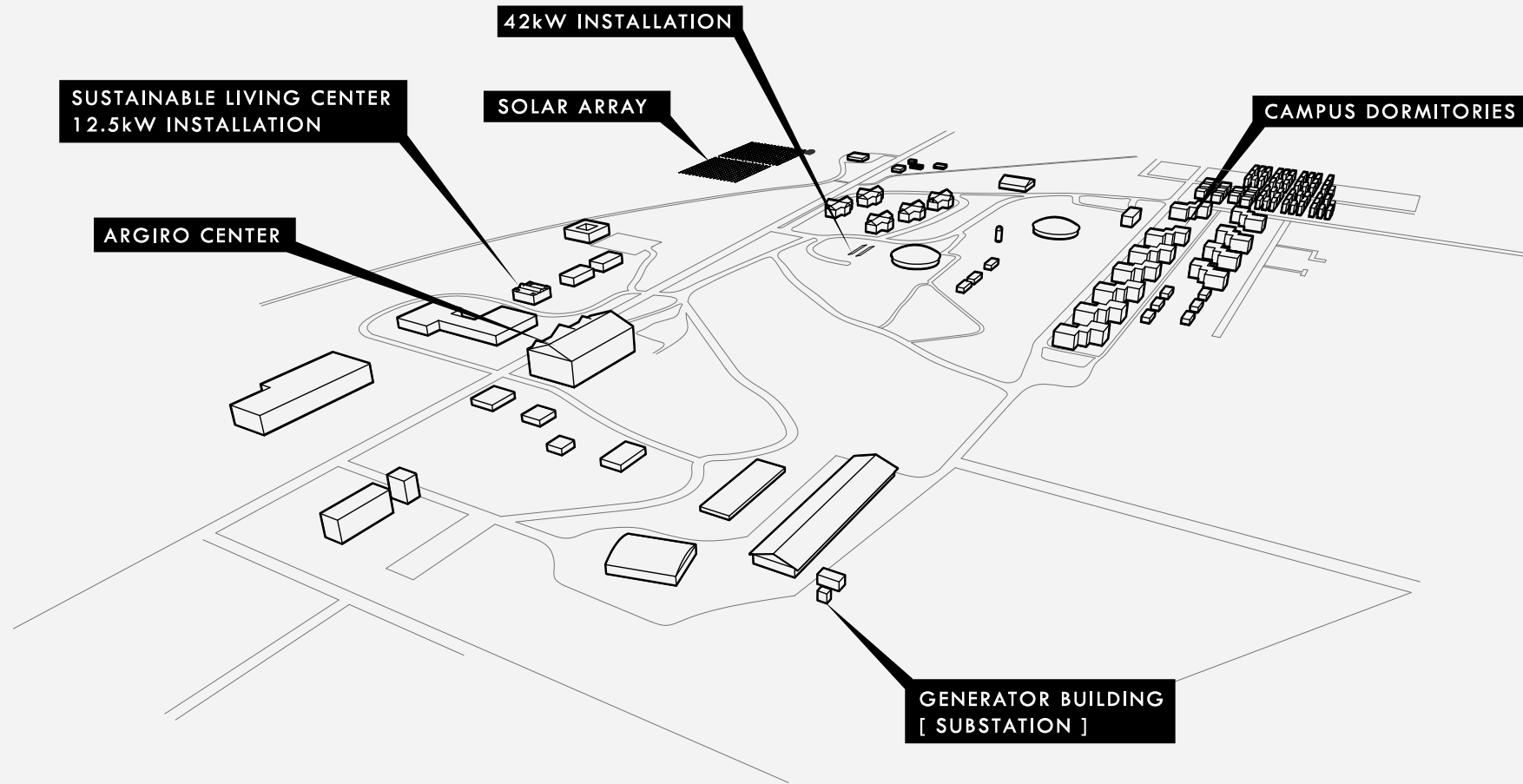
- Active tracking
  - Peak shaving
  - AI optimized
  - Weather stations with snow shedding capabilities
  - Pollinator project site
  - State battery research site
- 





# MUM SOLAR POWER PLANT MACRO - SITE AXON

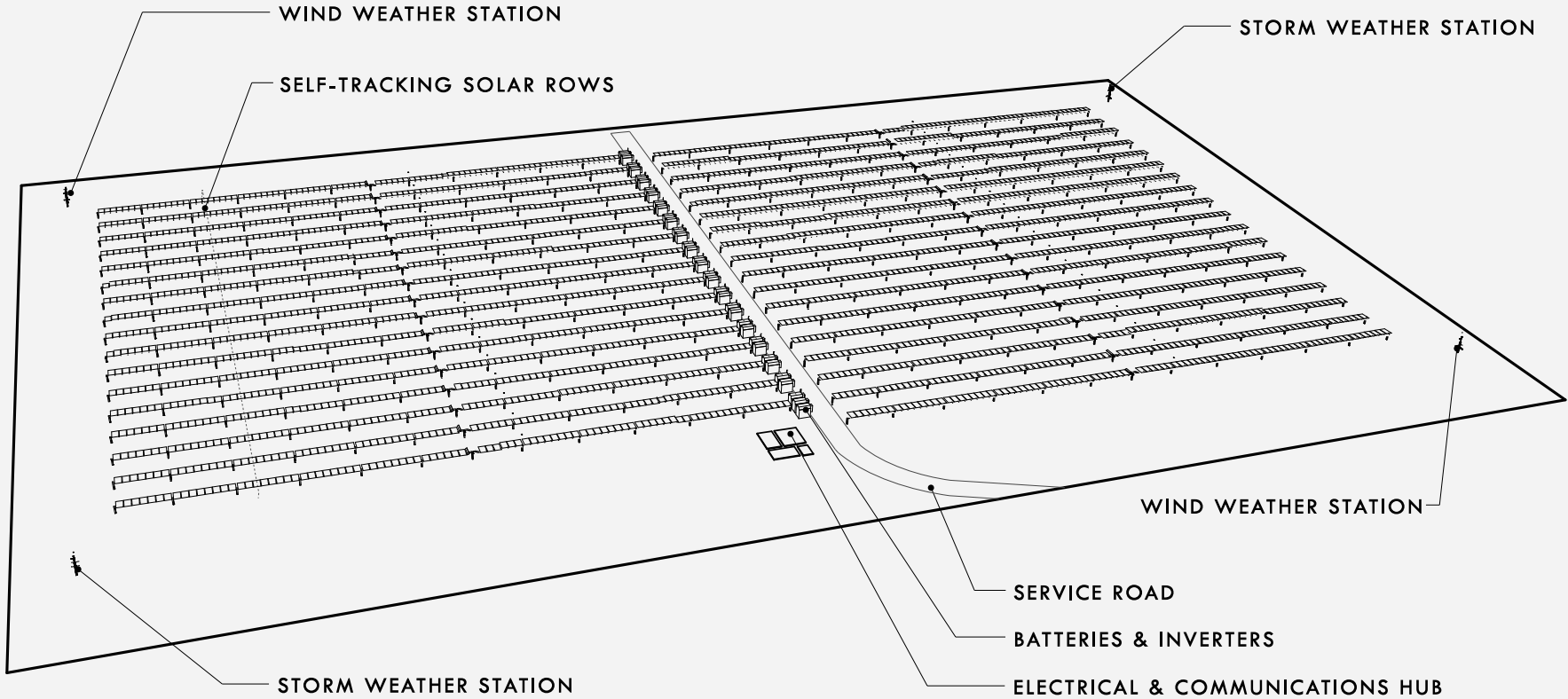
---





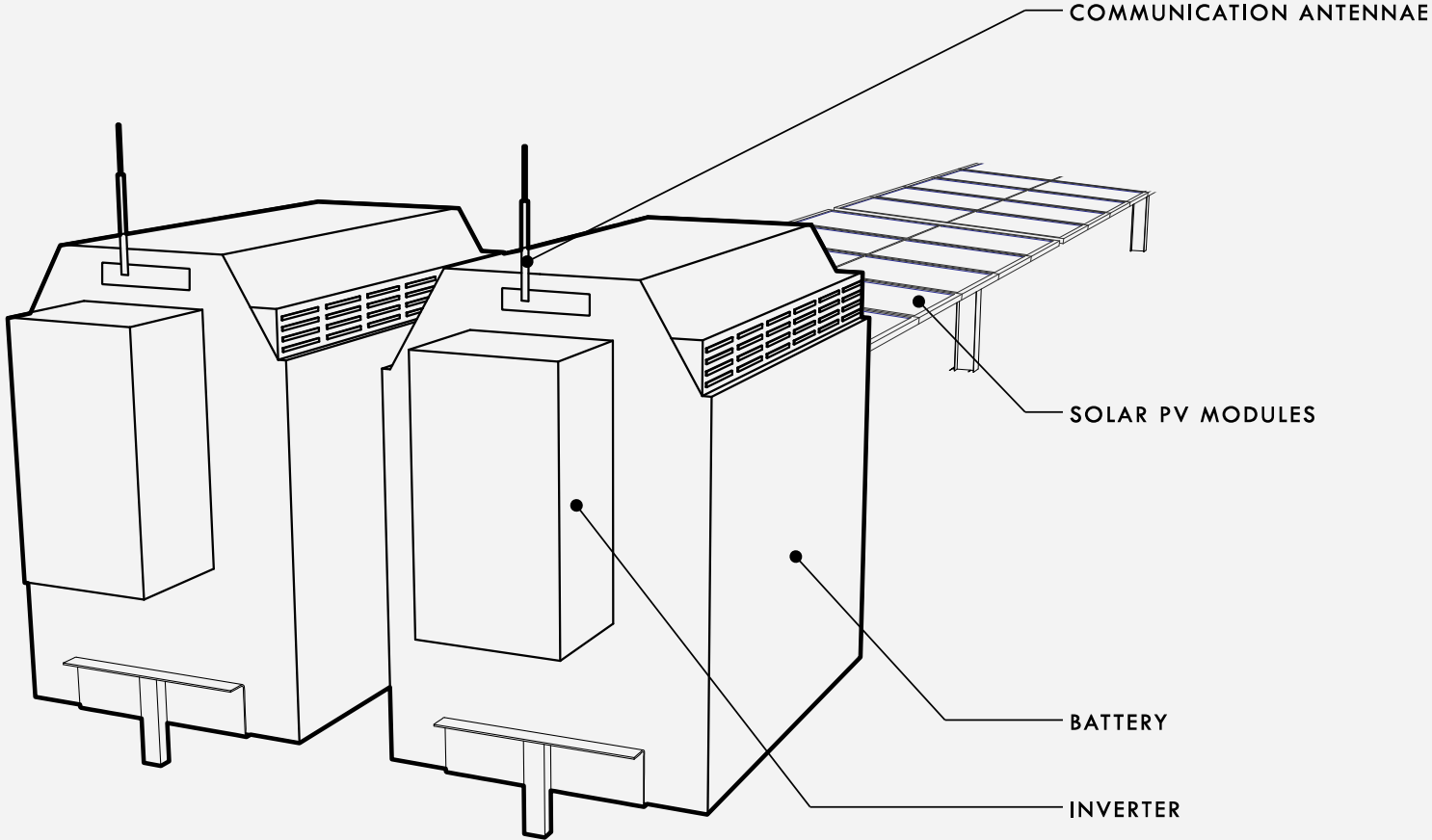
# MUM SOLAR POWER PLANT SITE AERIAL

---



# MUM SOLAR POWER PLANT BATTERIES & INVERTERS

---

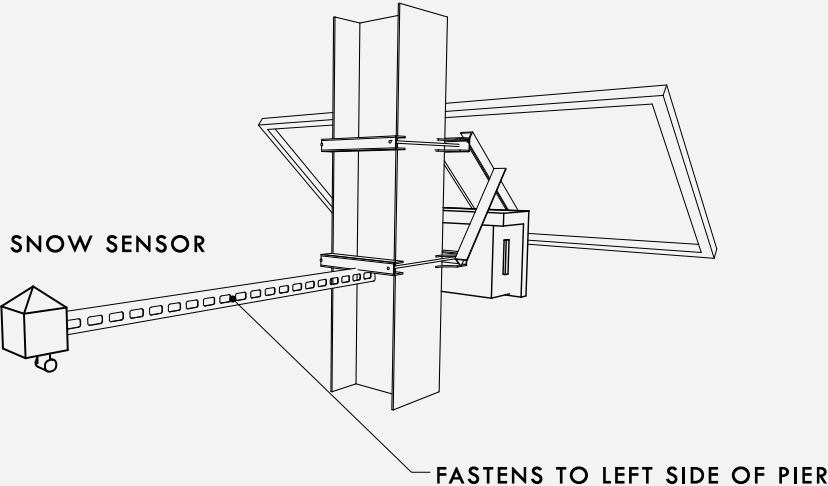
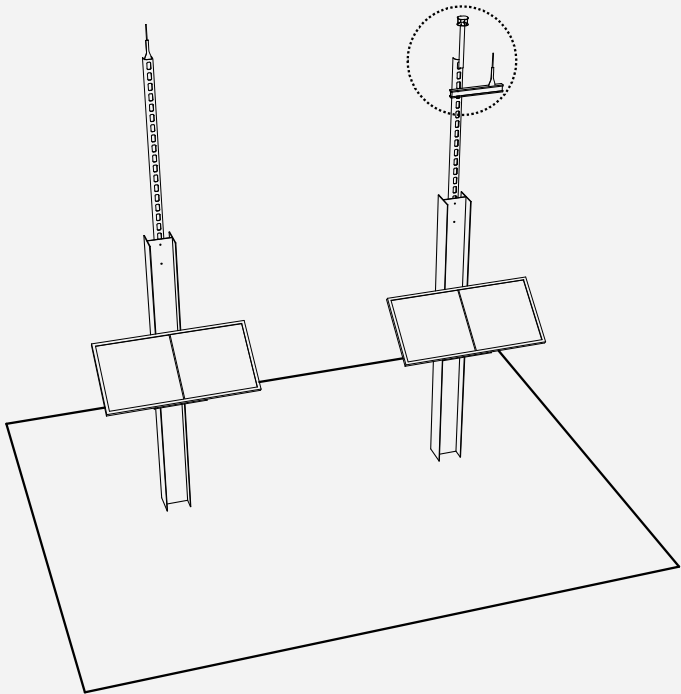




# MUM SOLAR POWER PLANT WEATHER STATIONS

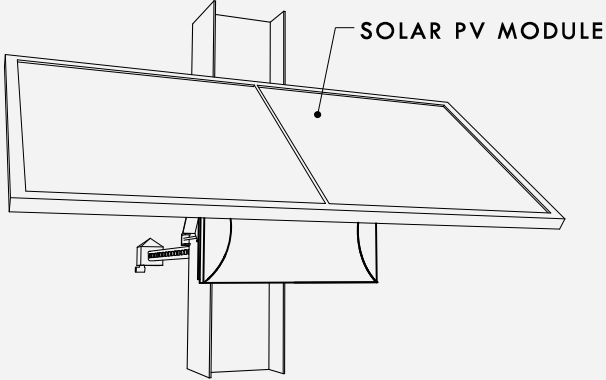
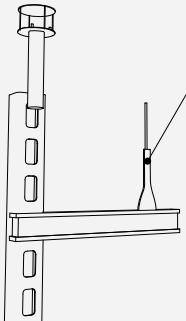
STORM WEATHER STATION

WIND WEATHER STATION



ANEMOMETER

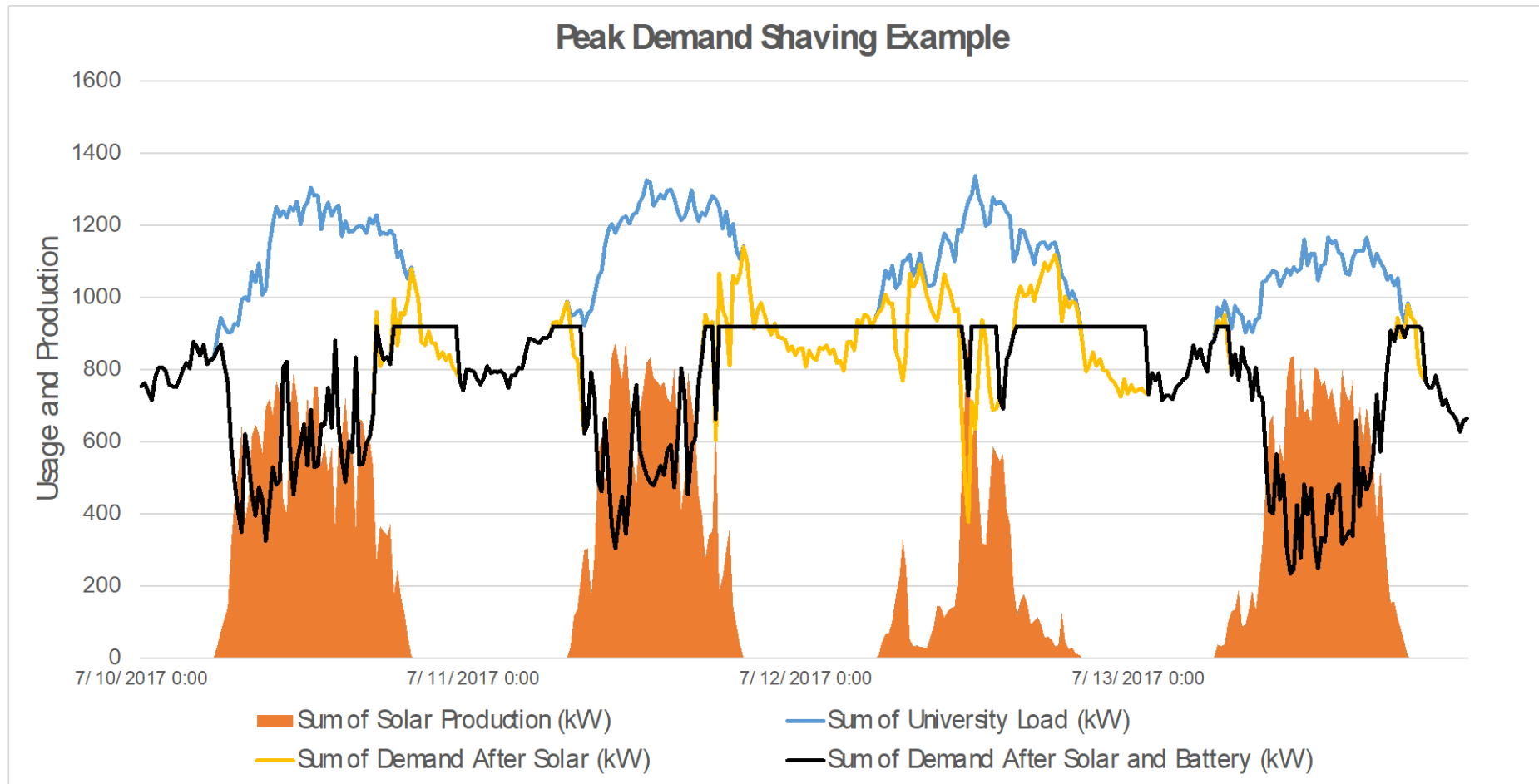
COMMUNICATION ANTENNA





## **Pollinator Project**

# Peak Demand Reduction





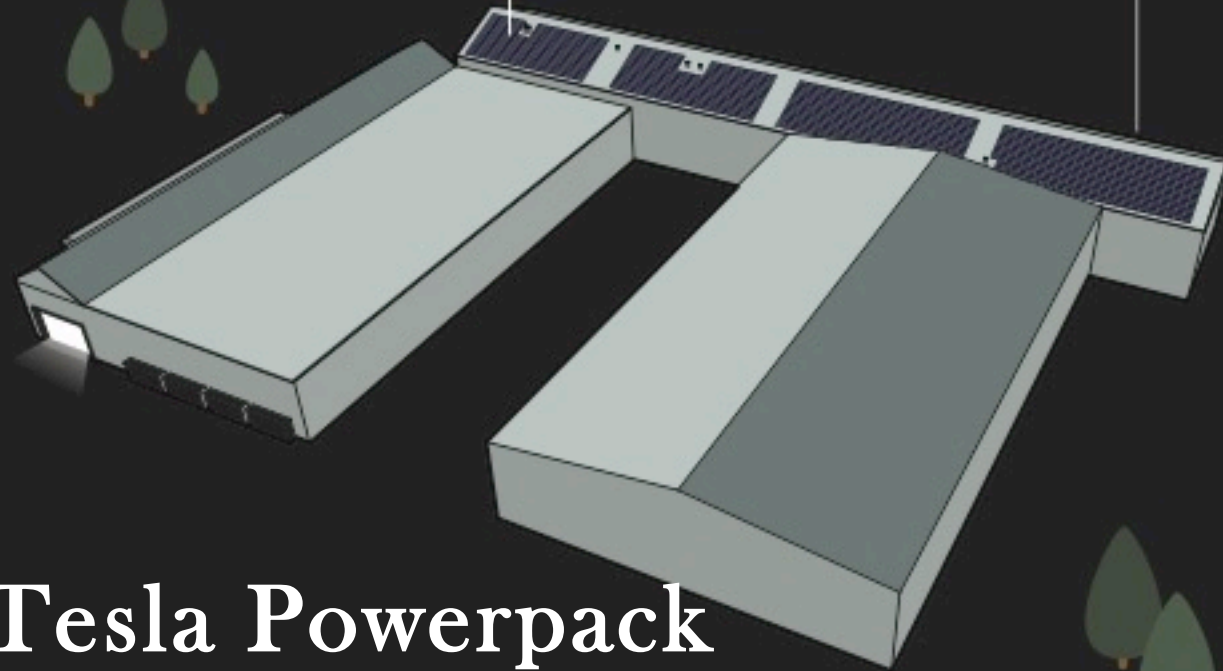
# Agri-Industrial Plastics Company





**SOLAR ARRAY**  
517 kW / 1,345 panels

**TESLA POWERPACK**  
Battery Energy Storage System  
212 kW / 424 kWh



Iowa's first solar & Tesla Powerpack  
energy storage project

# Specifications

---

## SOLAR ARRAY

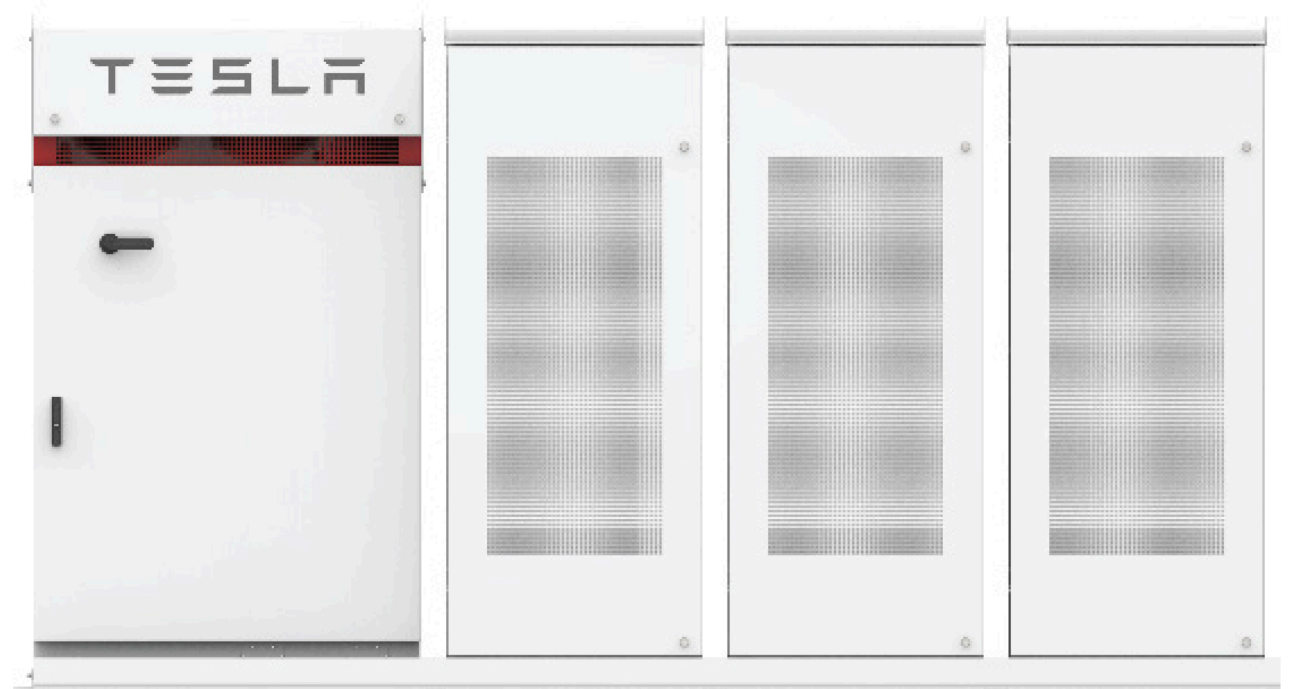
517 kW DC (400 kW AC) roof-mounted array  
composed of REC 370 watt panels

## INVERTERS

4 SolarEdge 100 kW inverters with power  
optimizers

## ENERGY STORAGE SYSTEM

215 kW / 430 kWh AC Tesla Powerpack





# Agri-Industrial Plastics | Iowa's first peak shaving power plant with Tesla Powerpack & solar

517 kW  
SYSTEM SIZE

\$1,590,832  
25 YEAR UTILITY SAVINGS

210 kW/430 kWh  
TESLA POWERPACK

6-7 years  
PAYBACK

633,997 kW  
ANNUAL PRODUCTION

10,298 t CO<sub>2</sub>  
EMISSION REDUCTION

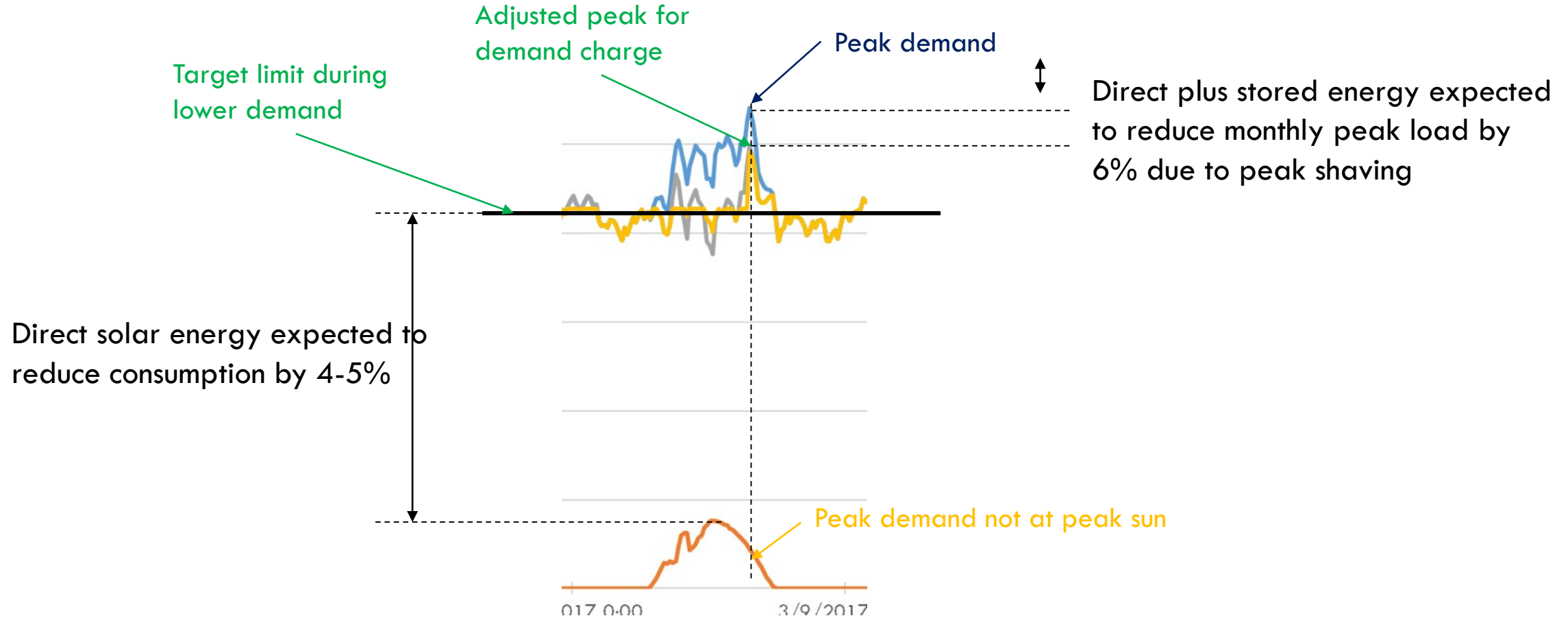


IOWA ENVIRONMENTAL COUNCIL  
2019 INNOVATION AWARD



# Agri-Industrial Plastics

## Load Profile with Projected Solar & Battery





A strategy to hire and retain top talent, reduce operating costs, and stay ahead of the competition.



“ I would consider solar a strategic investment for our future. We’re in it for the long haul. We’re in it for our customers, we’re in it for our employees, we’re in it for our community of Fairfield.

LORI SCHAEFER-WEATON, PRESIDENT  
AGRI-INDUSTRIAL PLASTICS COMPANY



# Earning recognition with environmentally conscious initiatives

# PLASTICS MACHINERY Magazine

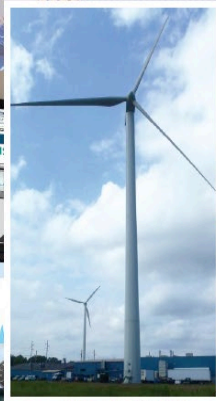
Innovations for processing and tooling technology

plasticsmachinerymagazine.com

June 2020

## POWER TRIP

Energy Management  
Page 7



**PLUS**  
Molder takes on COVID-19  
Page 34

A preferred publishing partner of the  
**PLASTICS**  
INDUSTRY ASSOCIATION

COVER STORY  
ENERGY MANAGEMENT

# RIGHT COMBINATION

## Blow molder finds savings with solar, battery storage combo

By Bruce Geiselman

**AGRI-INDUSTRIAL** Plastics (AIP) is a 400,000-square-foot blow molding processor operating 28 machines 24 hours a day, five days a week.

The Fairfield, Iowa, company for years has searched for ways to reduce electricity costs, and last year, it installed a 517-kilowatt (kW) roof-mounted solar array, which works in conjunction with a 212-kW (430 kilowatt-hour) Tesla Powerpack battery energy storage system. During the day, the solar panels power a small percentage of the plant's energy needs, while charging the battery storage system so it's available to supplement the plant's needs during times of high energy usage. Combining the solar panels with the battery allows the plant to engage in a practice called peak shaving, which reduces costly demand charges.

Iowa-based Ideal Energy designed the system, the first of its type in the state to combine solar power with a Tesla Powerpack battery storage system.

The array will save AIP more than \$42,477 per year and, compared with traditional systems, it will release 9,337 fewer tons of carbon dioxide into the atmosphere over the next 25 years, which is equivalent to more than 10 million pounds of coal, according to AIP.

"We're always looking at ways to control our costs for the long term," AIP President Lori Schaefer-Weaton said. "Obviously, our utility bill is a big one every month. It's a major part of our cost structure, so any way that we can bring that down is a good thing."

In 2012, the company decided to cut its energy use in part by switching to more energy-efficient lighting. At the time, the plant had older metal halide lights and they were on constantly.

"We were constantly illuminating cardboard boxes in the warehouse," said Geoff Ward, director of engineering and quality at AIP. "We switched to all fluorescents with motion sensors throughout the facility at that point."

As energy prices continued to rise, the company looked at other solutions, including the possible installation of a solar panel system, but the economic ramifications did not initially make sense.

Agri-Industrial Plastics relied on Ideal Energy to help find a solution.

"We'd been in conversations with them for four or five years," Ward said. "It's not like we jumped right out of the gate."

The turning point came when Ideal Energy proposed the idea of pairing a solar array with the Tesla battery storage system. The return on investment (ROI) for the solar panel system alone would have been about 14 or 15 years, which "absolutely didn't make any sense," Ward said. However, when the energy storage system was added, the ROI dropped to nine years on an after-tax basis.

By storing energy, the battery system allows AIP to shave its energy usage from the power grid during periods of peak demand. This maximizes the value of the solar array, so that the energy it generates can be used even when the sun is not shining. Peak energy use can significantly drive up an electric bill, Ward said.

"That was a big piece of the puzzle for us," he said.

"Their average usage when they are operational might be somewhere around 2.5 megawatts, but they will have spikes during the course of the day that might go up to 2.7, 2.8 or 2.9 megawatts, and those spikes are quite expensive for them," said Aurelien Windenberger, director of finance and design at Ideal Energy. "The battery can kick on anytime day or night when Agri-Industrial Plastics would hit a peak."

However, reducing the company's electric bill was not the only objective, Schaefer-Weaton said. The company also wanted to burnish its reputation among employees and customers for tackling sustainability issues.

"This solar project was a chance for us to really shine in terms of what makes us different," she said. "We are not your typical old-school manufacturing company. We do care about conserving energy for the long haul."

Most of Agri-Industrial Plastics' OEM customers have their own sustainability targets or goals, and AIP's use of solar energy can help them achieve those goals.

The combined solar and battery storage system allows the company to reduce the cost of energy purchases from the power grid by about 10 percent, Ward said. The amount of electricity the company purchases from the power grid has



Iowa-based Agri-Industrial Plastics uses a 517-kilowatt roof-mounted solar array to provide a portion of its manufacturing power needs.

dropped by about 5 percent. The size of the facility and the amount of energy its blow molding operation requires means that it is not feasible for the company to install a solar array large enough to meet all its needs.

The availability of federal, state and local tax credits also plays a major role in the affordability of solar panel installations. For those considering a solar power installation at their manufacturing facility, Windenberger cautions that federal support for green energy programs will soon be cut.

"The federal tax credit at the moment is 26 percent of the cost of the system, and that currently is declining," he said. "In 2021, that tax credit drops to 22 percent, and in 2022, it drops to 10 percent."

The impending loss of federal assistance might be an incentive for some companies to consider installing a solar power system this year or next. "Because that's going to be a pretty big drop down after 2021," Windenberger said.

Agri-Industrial Plastics was founded in 1978 and specializes in manufacturing fuel tank systems for non-automotive applications. ☘

Bruce Geiselman, senior staff reporter  
bgeiselman@plasticsmachinerymagazine.com

### For more information

Agri-Industrial Plastics Co.,  
Fairfield, Iowa, 641-472-4188,  
www.agriindustrialplastics.com

Ideal Energy Inc.,  
Fairfield, Iowa, 641-209-3288,  
www.idealenergysolar.com





**Iowa's First Advanced Manufacturing Peak Shaving Power Plant**

# Finance





# Financing Options

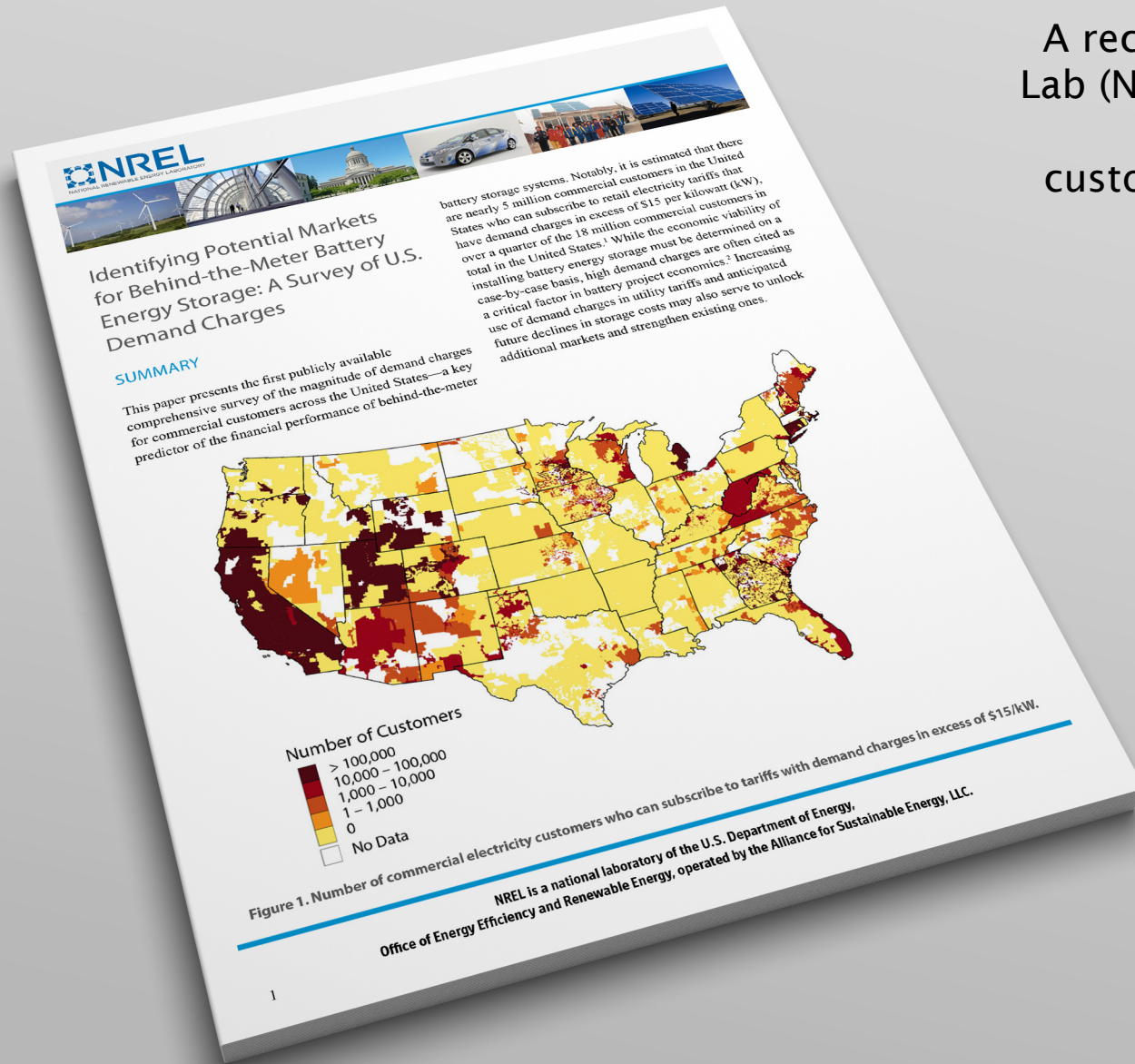
Direct Purchase	7-Yr Loan	Operating Lease
Simplest process highest return	<p>Great option if client can benefit from the tax incentives but wants to finance the system.</p> <p>Zero net out of pocket over the 7-year term of the loan as tax incentives and utility savings more than cover loan interest payments.</p>	<p>Best option client does not expect to have high tax appetite to use investment tax credits and depreciation benefits</p> <p>Zero net out of pocket over 7-year lease term. The financing entity offers attractive lease rates because they can use the tax benefits.</p>

**No money down and stay cash positive!**

# Opportunities

---

A recent report from the National Renewable Energy Lab (NREL) identifies Iowa as one of the top 10 states in the country with 23,000 commercial utility customers poised to reduce electrical costs with the use of battery energy storage technology.



**Table 3. Top 10 States with the Most Commercial Customers Estimated to be Eligible for Utility Rates That Include Demand Charges of \$20/kWh or Higher**

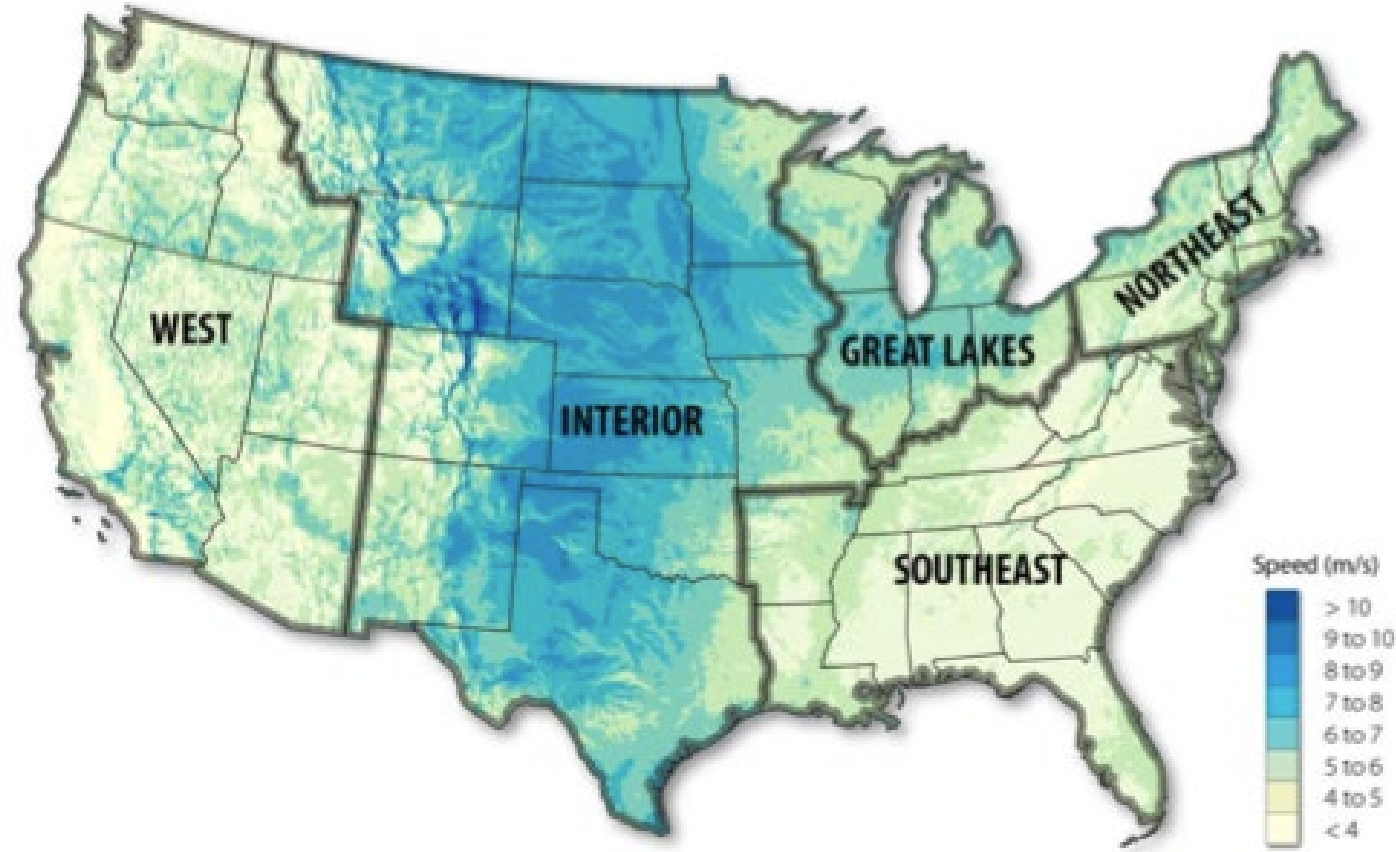
	Number of Customers Eligible for Demand Charge >\$20/kWh
California	1,081,000
New York	648,000
Georgia	216,000
Michigan	205,000
Massachusetts	180,000
Kentucky	41,000
New Mexico	24,000
Alabama	23,000
Texas	23,000
Iowa	23,000



# Renewable H2

---

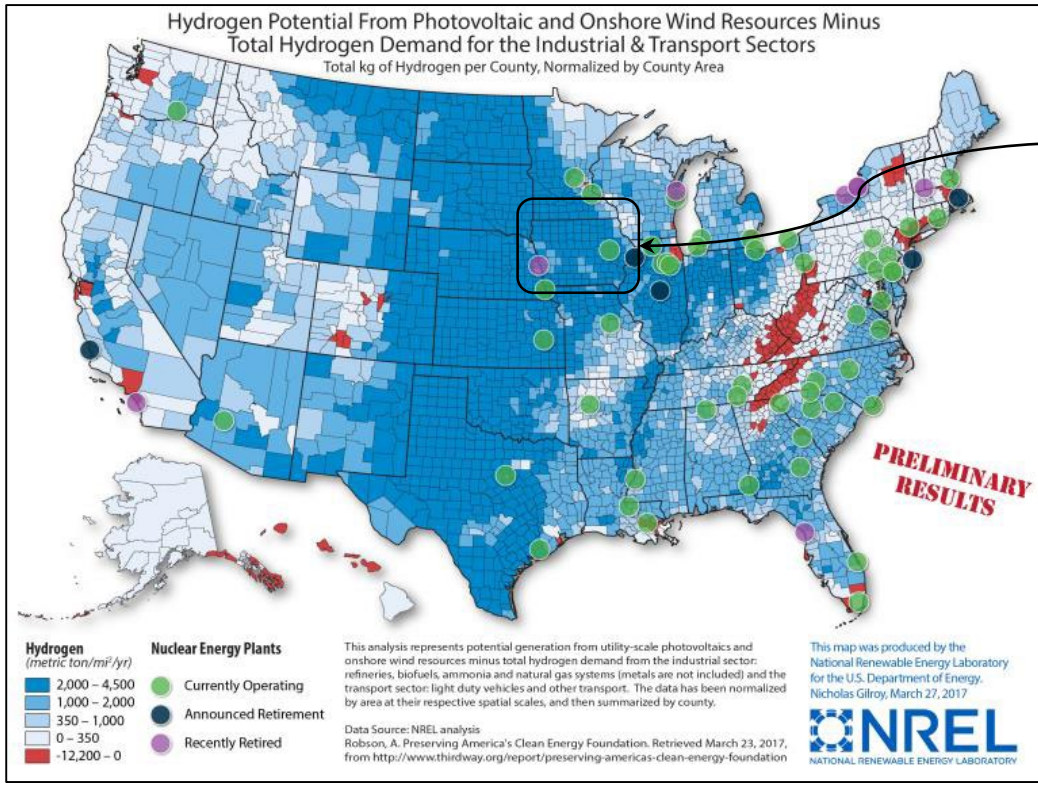
# U.S. Wind Resource Map



Source: 2018 Wind Technologies Market Report, U.S. Dept. of Energy

Sources: AWS Truepower, National Renewable Energy Laboratory (NREL)

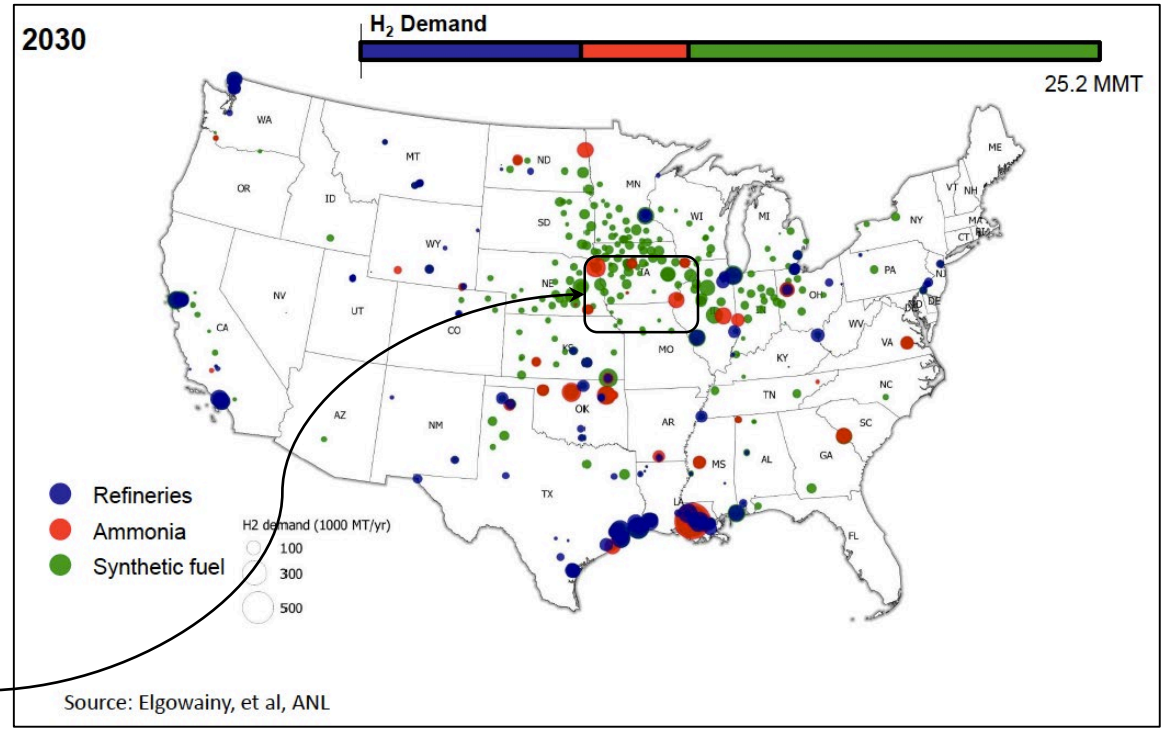
∴ Iowa is part of the American “wind belt” and has an excellent wind resource, especially on the western side of the state.



Iowa is one of the best U.S. States in terms of renewable H<sub>2</sub> potential because of access to low-cost PV and wind power.

Source: <https://www.energy.gov/eere/fuelcells/h2-scale-rd-consortium-kick-meeting>

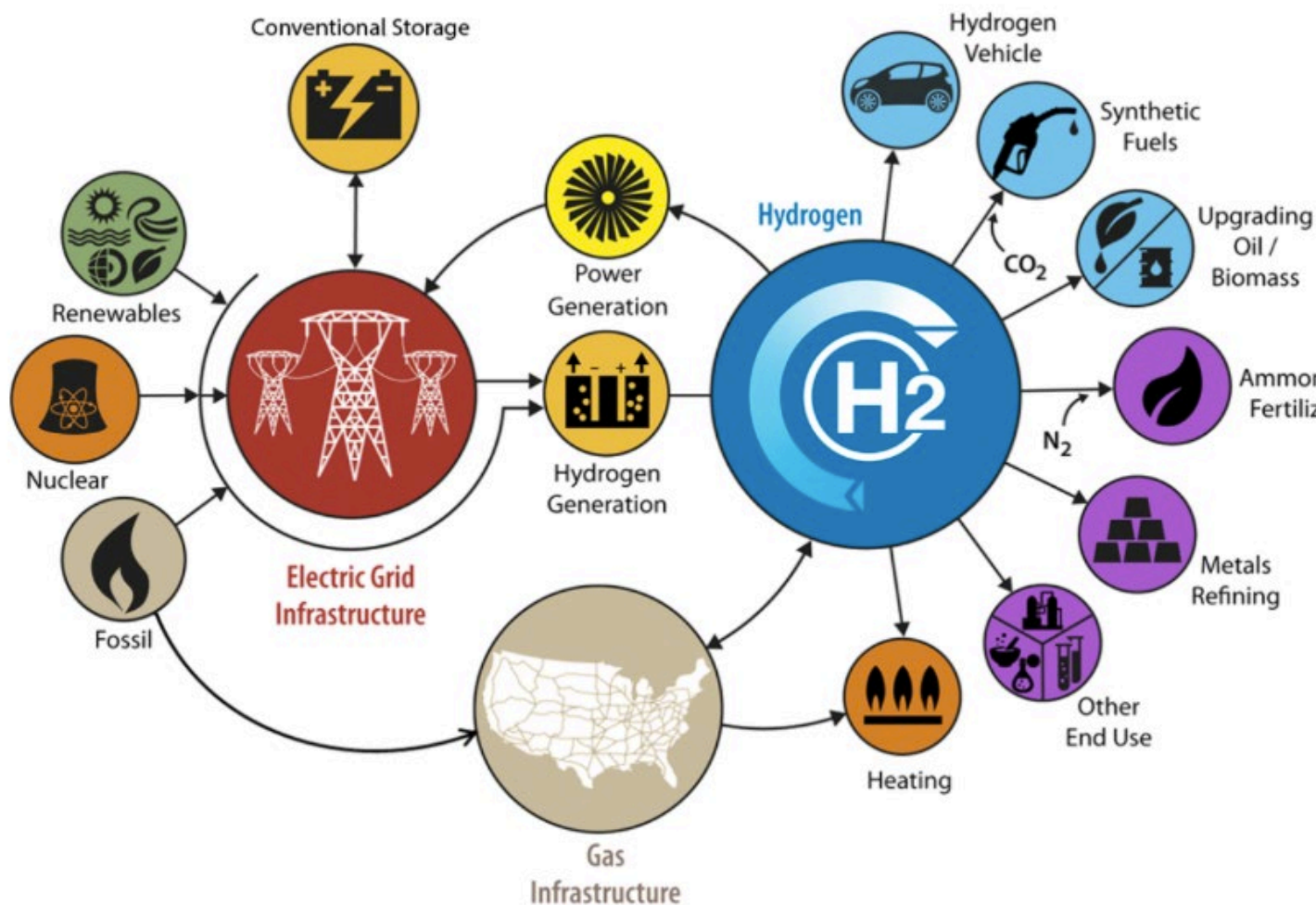
And it is one of the best U.S. States in terms of future H<sub>2</sub> demand for renewable fuels and ammonia production.



Source: Elgowainy, et al, ANL



# H<sub>2</sub> and the Modern Energy System



Source: <https://www.energy.gov/eere/fuelcells/h2scale>

- The zero-carbon energy system of the near future will involve the generation, distribution and storage of both electricity and a basic chemical energy carrier that can be easily stored, transported and used in the processing of other basic commodities.
- Hydrogen (H<sub>2</sub>) is widely viewed as the best choice since it can be easily generated by splitting water molecules using renewable electricity.

Questions?

---

Thank You







# Contact

---

Ideal Energy, Inc.  
Troy Van Beek, CEO  
602 N 6<sup>th</sup> St, Fairfield, IA  
52556

[troy@idealenergyinc.com](mailto:troy@idealenergyinc.com)  
Ph. (641) 209-3288

[idealenergysolar.com](http://idealenergysolar.com)

