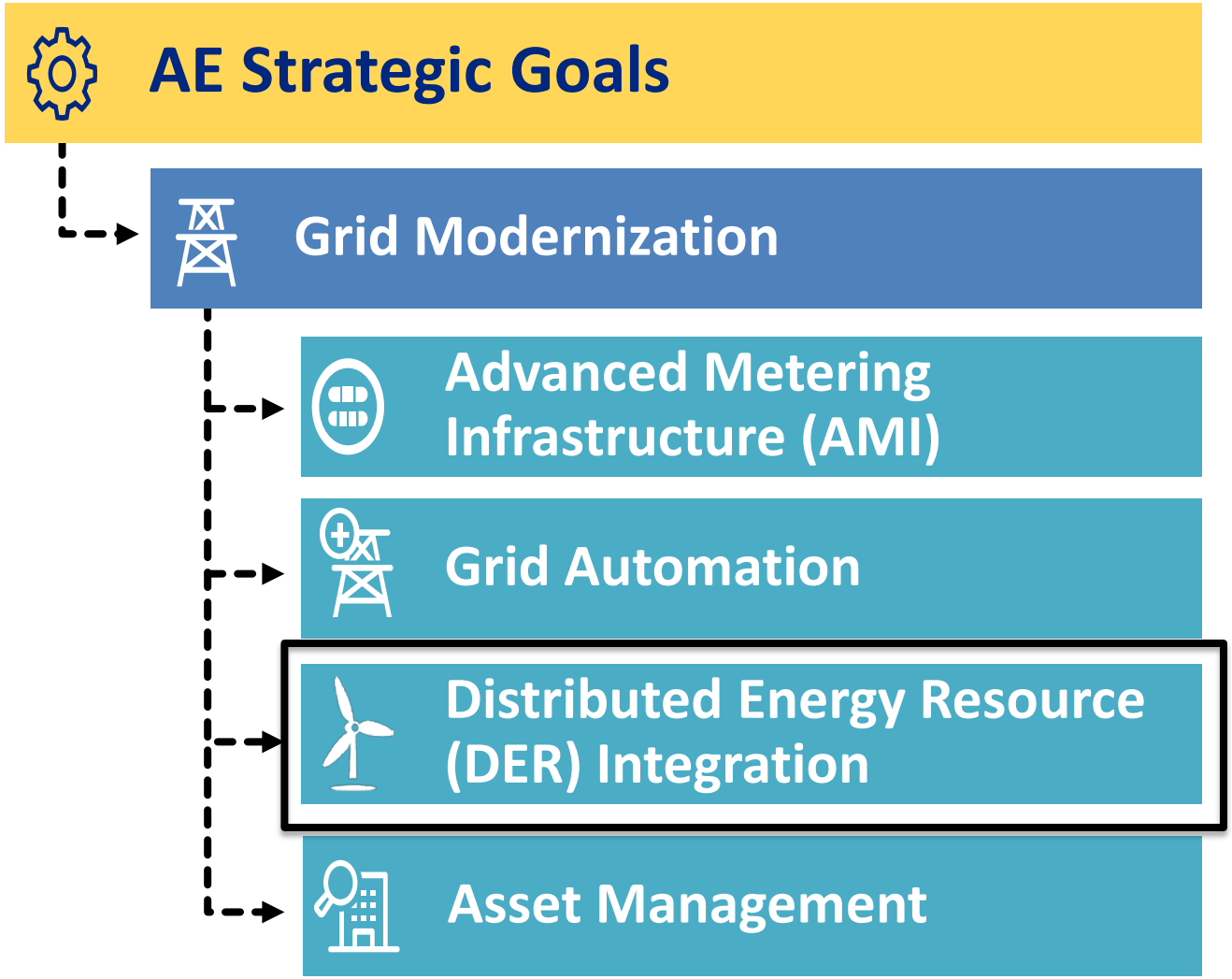
Austin SHINES Update

Resource Management Commission Meeting
June 17, 2018

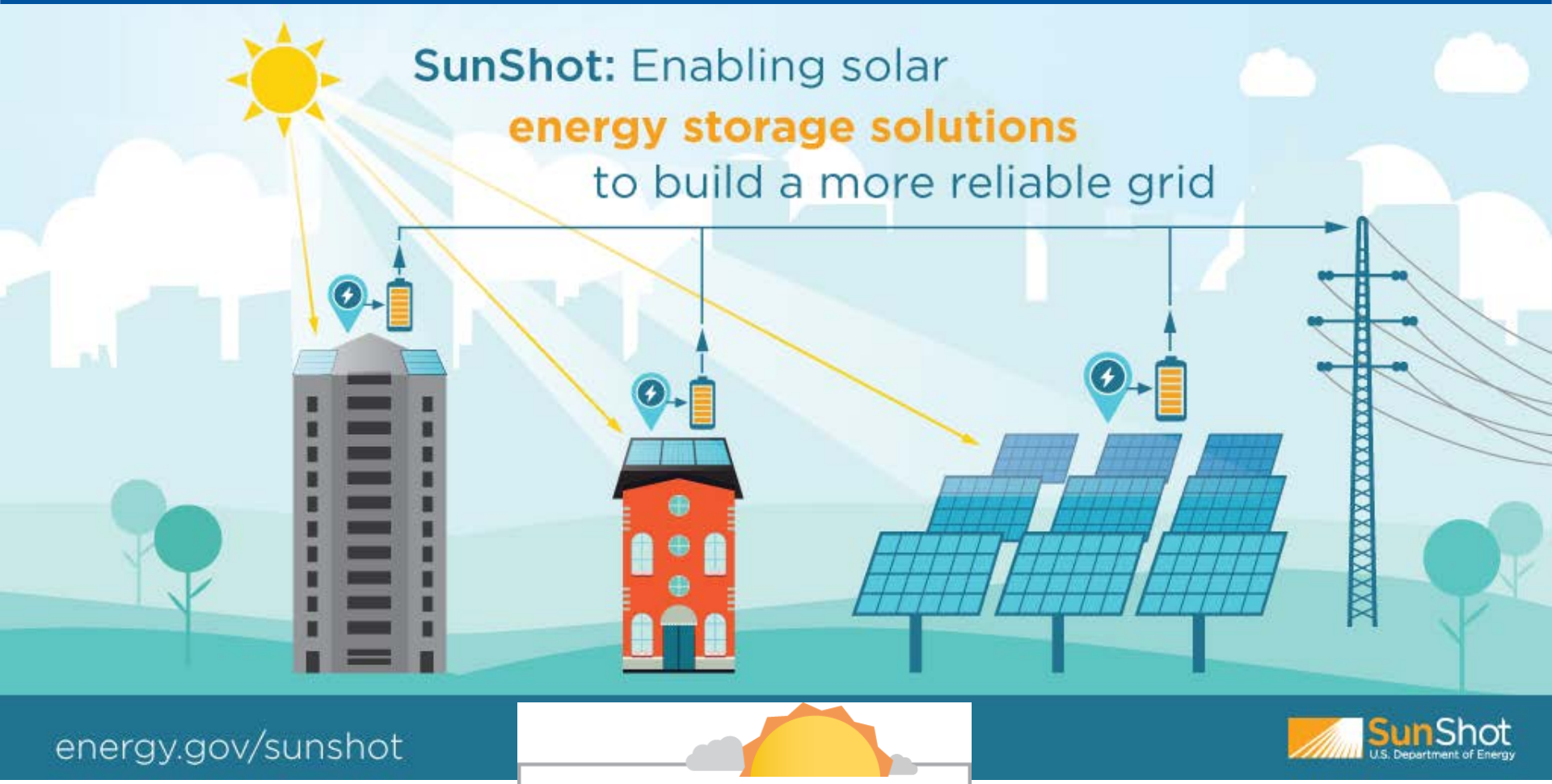
Dan Smith, P.E. – Vice President
Electric Service Delivery



Grid Modernization Strategy



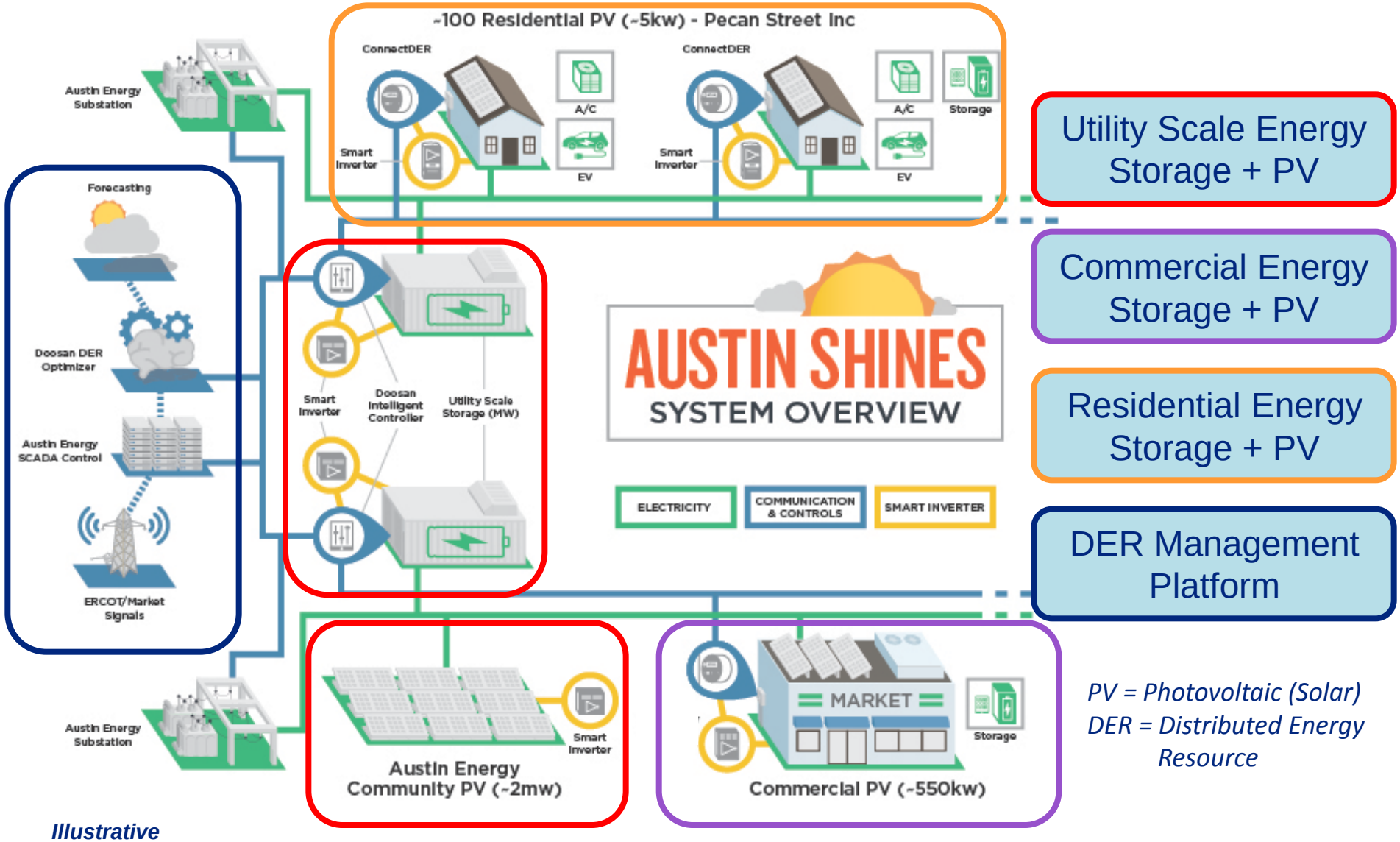
DOE SunShot & SHINES Vision



AUSTIN SHINES

Sustainable and **H**olistic **IN**tegration of **E**nergy Storage and **S**olar PV

Austin SHINES Concept



Utility Scale Energy Storage + PV

Commercial Energy Storage + PV

Residential Energy Storage + PV

DER Management Platform

PV = Photovoltaic (Solar)
DER = Distributed Energy Resource

Illustrative

Austin SHINES Partnerships





























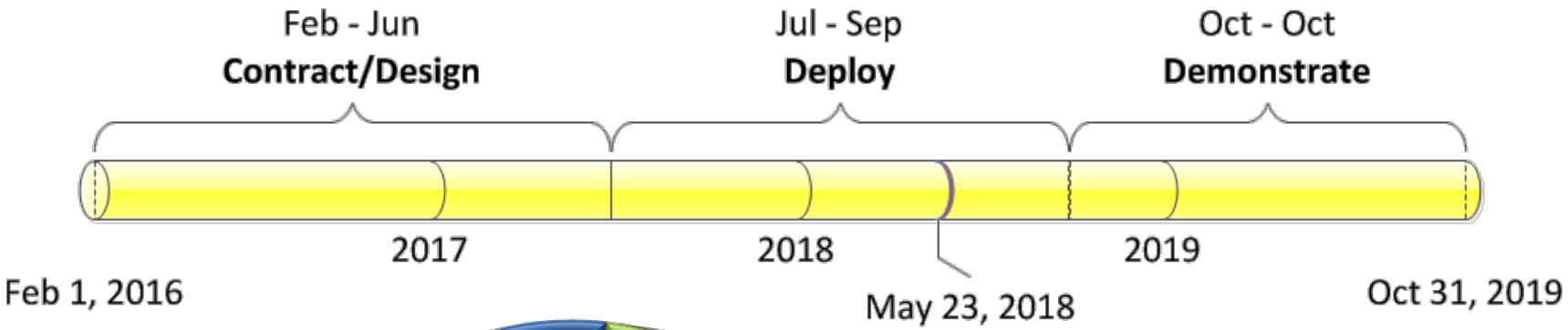


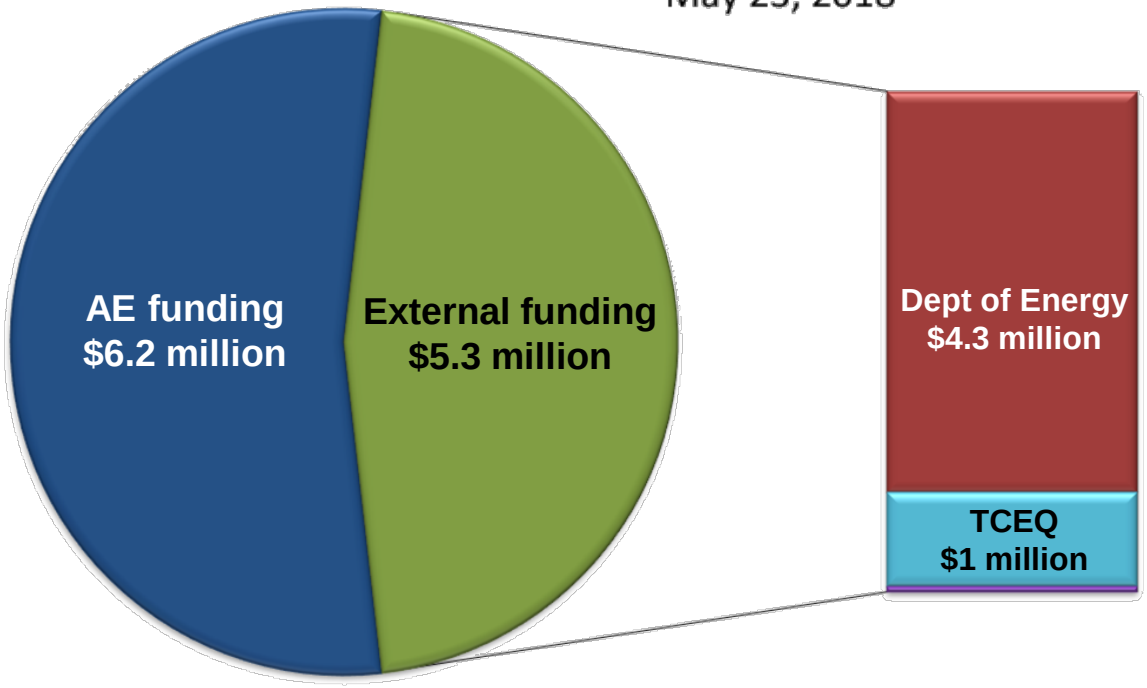






Project Timeline and Funding





AE is leveraging over $5.3 million in external funding to accomplish an innovative and complex project

Kingsbery Energy Storage Site



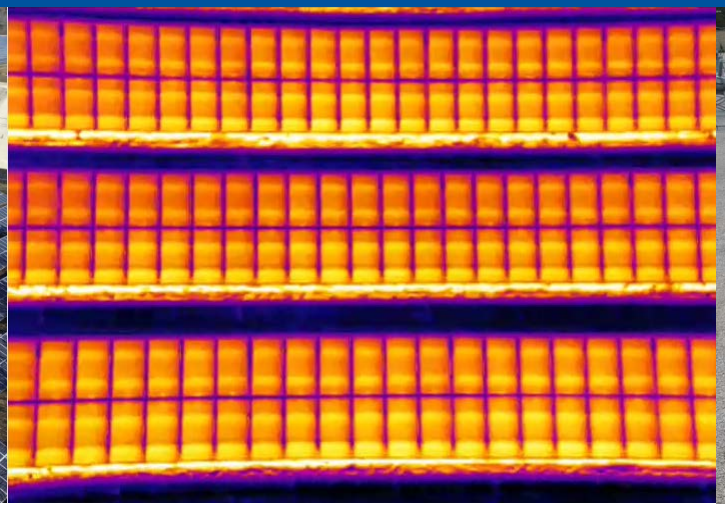
Current Status



Kingsbery ESS: 1.5 MW / 3 MWh

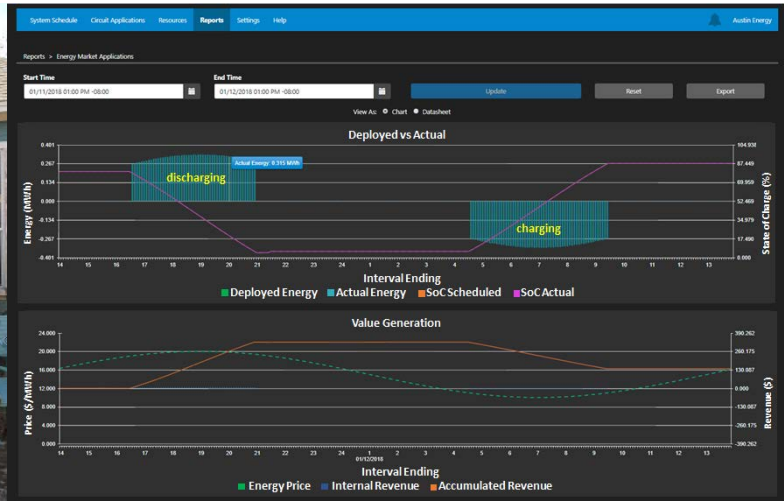
Lithium Ion

Current Status


Installed and Energized La Loma Community Solar and Kingsbery Battery



Installed Commercial and Residential Batteries and Software Development in Progress

Commercial & Residential Installations



Figure 1: 72kW/144kWh commercial battery



Figure 2: Electrical installation work



Figure 3: 1kW battery packs



Figure 4: External interconnection equipment for solar and storage



Figure 5: 5kW/10kWh residential battery



Figure 6: Solar smart inverter

Civil Site Prep for Mueller Battery



Figure 1: Crews working on rebar structures for battery foundations



Figure 2: Aerial view of the civil work for Mueller Battery



Figure 3: Prep work for interconnection foundations



Figure 4: Battery foundation



Figure 5: Crews working on rebar structures for battery foundations



Figure 6: Battery foundations ready

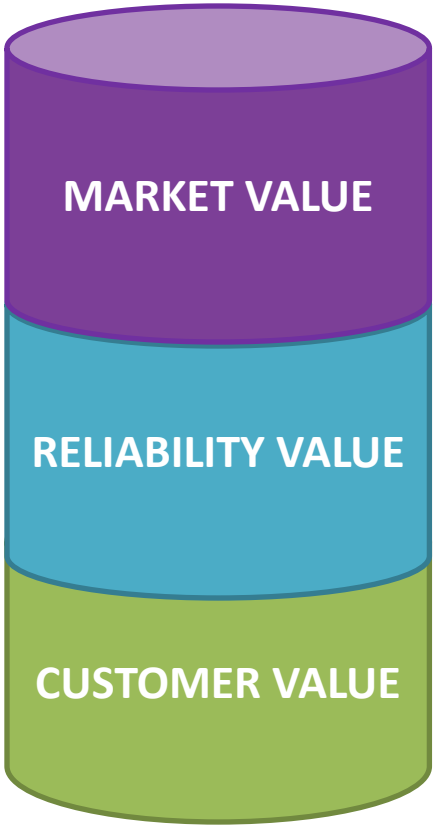
Mueller Energy Storage Site

Educational Signage & Viewing area
Security Wall that Meets Mueller Neighborhood Design Guidelines



Distributed Energy Resource Value Stacking

“Stacking the Value”



	Application	Benefit
MARKET	Utility Peak Load Reduction	Lower Transmission Cost Of Service obligation
MARKET	Day-Ahead Energy Arbitrage	Price differences create economic value
MARKET	Real-Time Price Dispatch	Economic value from real-time price spikes
RELIABILITY	Voltage Support	Reduce losses and increase PV generation
RELIABILITY	Distribution Congestion Management	Increase local grid reliability
CUST	Demand Charge Reduction	Customer and system benefit

Awards and Recognition

In December 2017, SmartCitiesDIVE named Austin Energy the

2017 Utility of the Year

including references to Austin SHINES

Mayor Adler Retweeted

Austin Energy @austinenergy · 4 Dec 2017

JUST IN: @austinenergy has been named Utility of the Year by @smartcitiesdive magazine bit.ly/2iju8WT



3 14 39

https://www.smartcitiesdive.com/news/utility-of-the-year-austin-energy/511127/

Awards and Recognition

In April 2018, GreenTech Media awarded Austin SHINES

2018 Grid Edge Innovation Award

GRID EDGE

Meet the Top Companies Changing the Face of the Electric Grid in 2018

The 2018 Grid Edge Innovation Awards: Our top picks for the projects, companies and partnerships breaking new ground on the grid edge.



Photo Credit: New York Power Authority

https://www.greentechmedia.com/articles/read/the-2018-grid-edge-innovation-awards#gs.=dyK1Ao

Integration of energy storage and solar PV: Austin Energy, Doosan GridTech and SHINES

Back in 2016, Austin Energy, the municipal utility serving Texas' capital city, landed a $3.4 million grant from DOE's Sustainable and Holistic Integration of Energy Storage and Solar PV (SHINES) program, to stand up a platform that could manage solar PV, battery, demand response and other DERs across its distribution system. There are many different names for this kind of capability — virtual power plant and distributed energy resource management systems are two common ones — but few examples of projects at scale.

The end goal was solar-storage costs of about 14 cents per kilowatt-hour — a complicated metric, meant to represent a "credible pathway to a competitive levelized cost of energy for solar energy when augmented by storage and other DER management and optimization tools," as GTM Research puts it.

Austin Energy's long list of SHINES project partners have put together a smorgasbord of DERs, including two utility-scale energy storage systems, multiple customer-sited energy storage systems, rooftop solar systems at residential and commercial properties, smart inverters, forecasting tools, market signals, and advanced communications.

To optimize this mix of assets, Austin Energy has turned to the DER optimizer from Doosan Gridtech, the platform acquired by the South Korean industrial giant when it bought Seattle-based 1Energy in 2016. 1Energy has deployed a set of battery-grid systems across the Pacific Northwest using a software platform built to standards from the Modular Energy Storage Architecture (MESA) Standards Alliance.

Austin Energy is testing multiple communications pathways to see how they perform for different applications. It has until April 2019 to complete the project and report on results. The stakes for Austin Energy are high. Austin has set a goal of 65 percent renewable energy generation by 2027, along with local solar and energy storage goals. Austin Energy is working toward 10 megawatts of distributed storage and 55 percent renewable energy by 2025.

Awards and Recognition

Smart Cities Connect awarded Austin SHINES a **2018 Smart 50 Award** in the field of energy (Awardee List)

Austin Energy takes home two Smart Cities awards for innovation

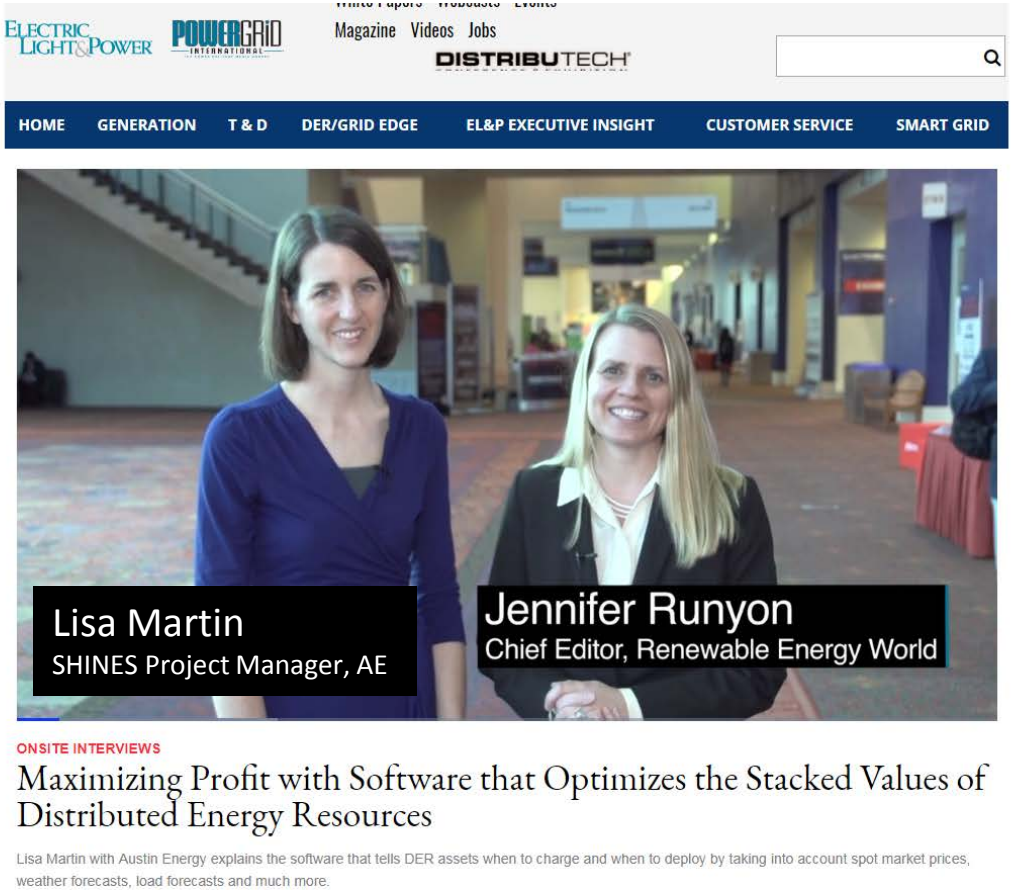
Thursday, April 12, 2018



Cameron Freberg accepted two awards on behalf of Austin Energy at the Smart Cities Conference and Expo.

Awards and Recognition

DistribuTech Editorial Spotlight highlighting DERO's ability to optimize stacked value of DER (video interview)



Awards and Recognition

Local NPR piece on pairing La Loma Community Solar with Kingsbery Energy Storage (KUT radio; Austin Monitor)

KUT 90.5 Austin's NPR Station

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Community Solar Farm And Batteries Test Power Of Austin's Electric Grid

By MOSE BUCHELE • APR 11, 2018

Tweet
Share
Google+
Email



La Loma Community Solar Farm in East Austin holds enough solar panels to power 440 households.

GABRIEL C. PÉREZ / KUT

Awards and Recognition

Smart Electric Power Alliance

SEPA POWER PLAYERS

The SEPA Power Players Awards are the premier industry accolade that honor utilities, their partners, and individual thought leaders providing the vision, models and momentum for the electric power industry's smart transition to a clean, modern energy future. You can see all the 2018 finalists here.

Utility of the Year

Recognizing Investor-Owned, Public Power and Electric Cooperative utilities that demonstrate leadership through unique or thought-provoking innovation in an effort to significantly advance knowledge of or access to distributed energy resources and expand their value as a resource to help meet the needs of electricity consumers.

Public Power Utility

AUSTIN ENERGY

Austin Energy has worked to meet ambitious clean energy goals, add storage, support distributed generation and electric vehicles, and advance customer service offerings. Their 2017 update to the Resource, Generation and Climate Protection Plan included goals of 65% renewable energy, 950 MW of solar (including 200 MW local solar), and 900 MW energy efficiency and demand response by 2027, 10 MW of non-thermal storage by 2025, and 330 electric vehicles into the city fleet by 2020.

Through the Austin SHINES (Sustainable and Holistic Integration of Energy Storage and Solar PV) Project, Austin Energy is deploying energy storage paired with solar PV at residential, commercial and utility scales.

QUESTIONS?



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VP, Electric Service Delivery

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