

NEW BUSINESS MODELS AT THE DISTRIBUTION EDGE

National Town Meeting on Demand Response and Smart Grid

May 28, 2015

James Sherwood – Senior Associate
jsherwood@rmi.org

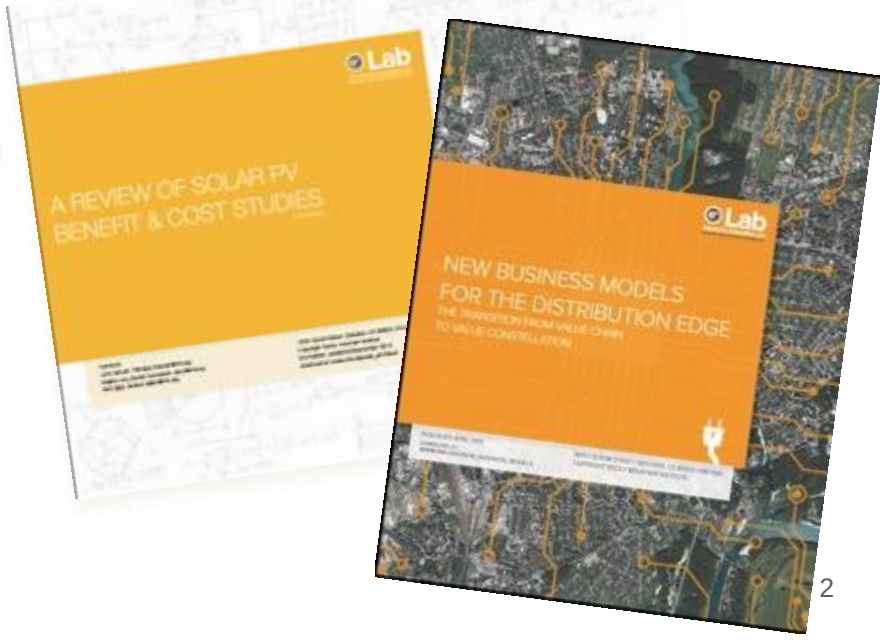
RMI. Creating a clean, prosperous, and secure energy future.™

About RMI and e-lab

Rocky Mountain Institute works across industries on challenging energy issues to drive the efficient and restorative use of resources with market-based approaches



e-Lab brings together leading electricity sector actors to solve regulatory, business, and economic barriers to the deployment of distributed resources



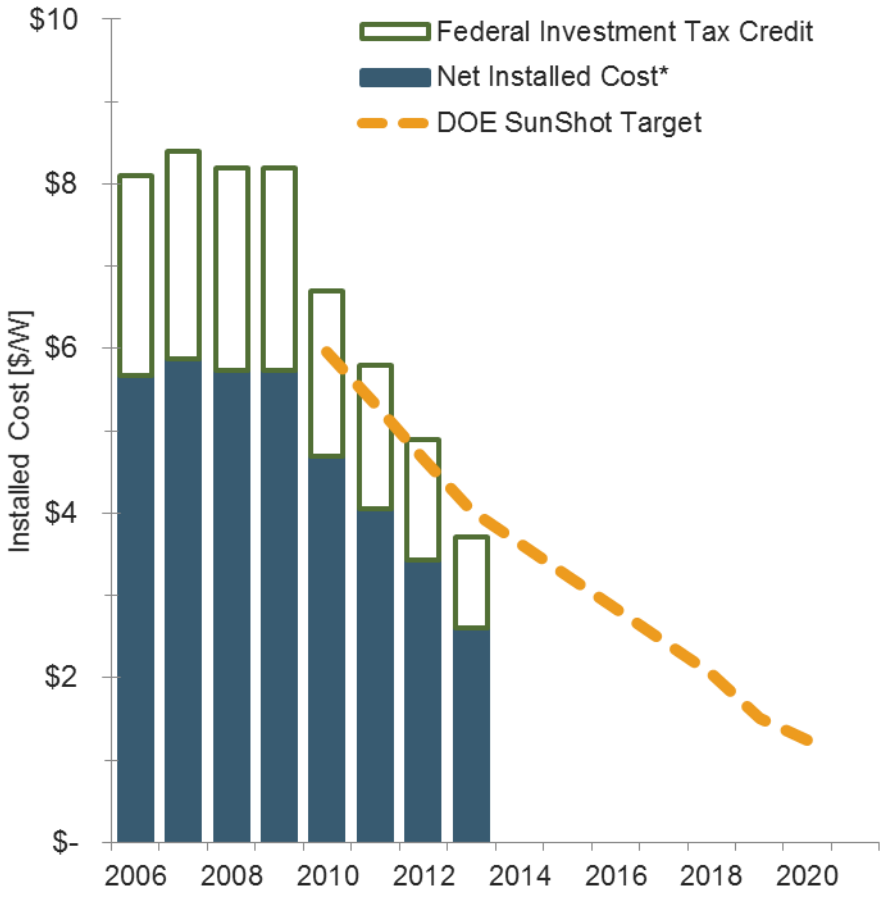
Topics for today

- **The need for new business models**
- **A roadmap for creating solutions**
- **Discussion of types of solutions**
- **One example: community solar + demand response program**

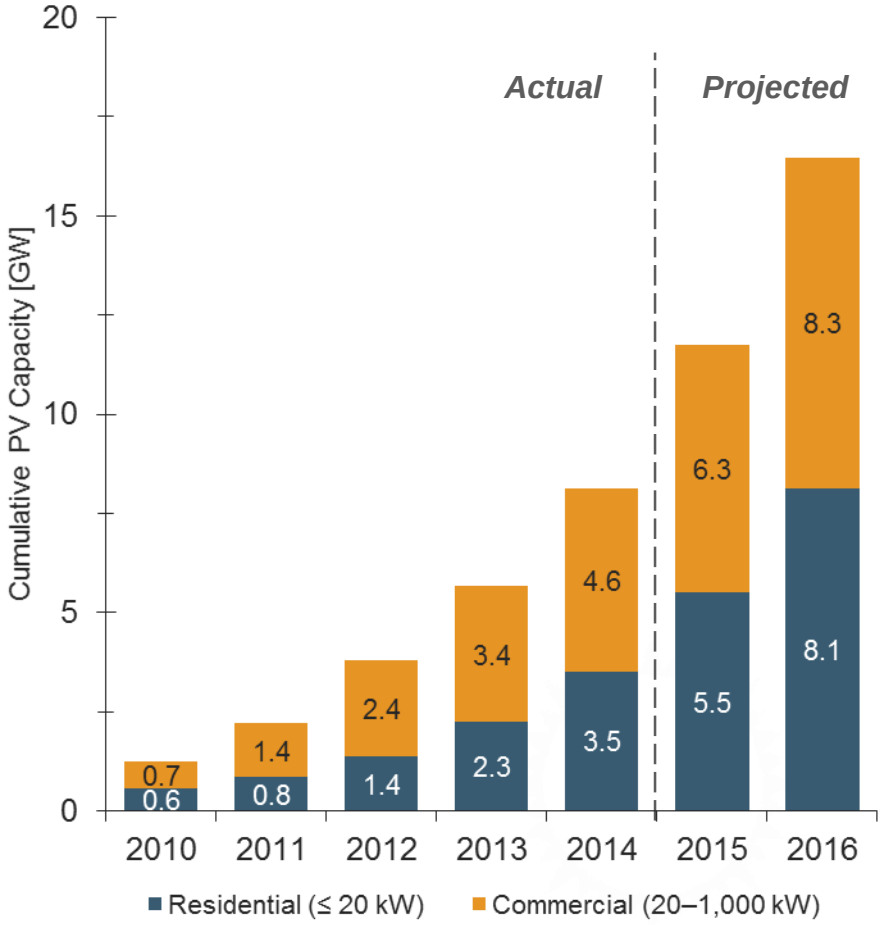


Dramatic PV cost reductions have helped to drive rapid market growth in the U.S.

Total installed cost for commercial PV systems (10–100 kW)

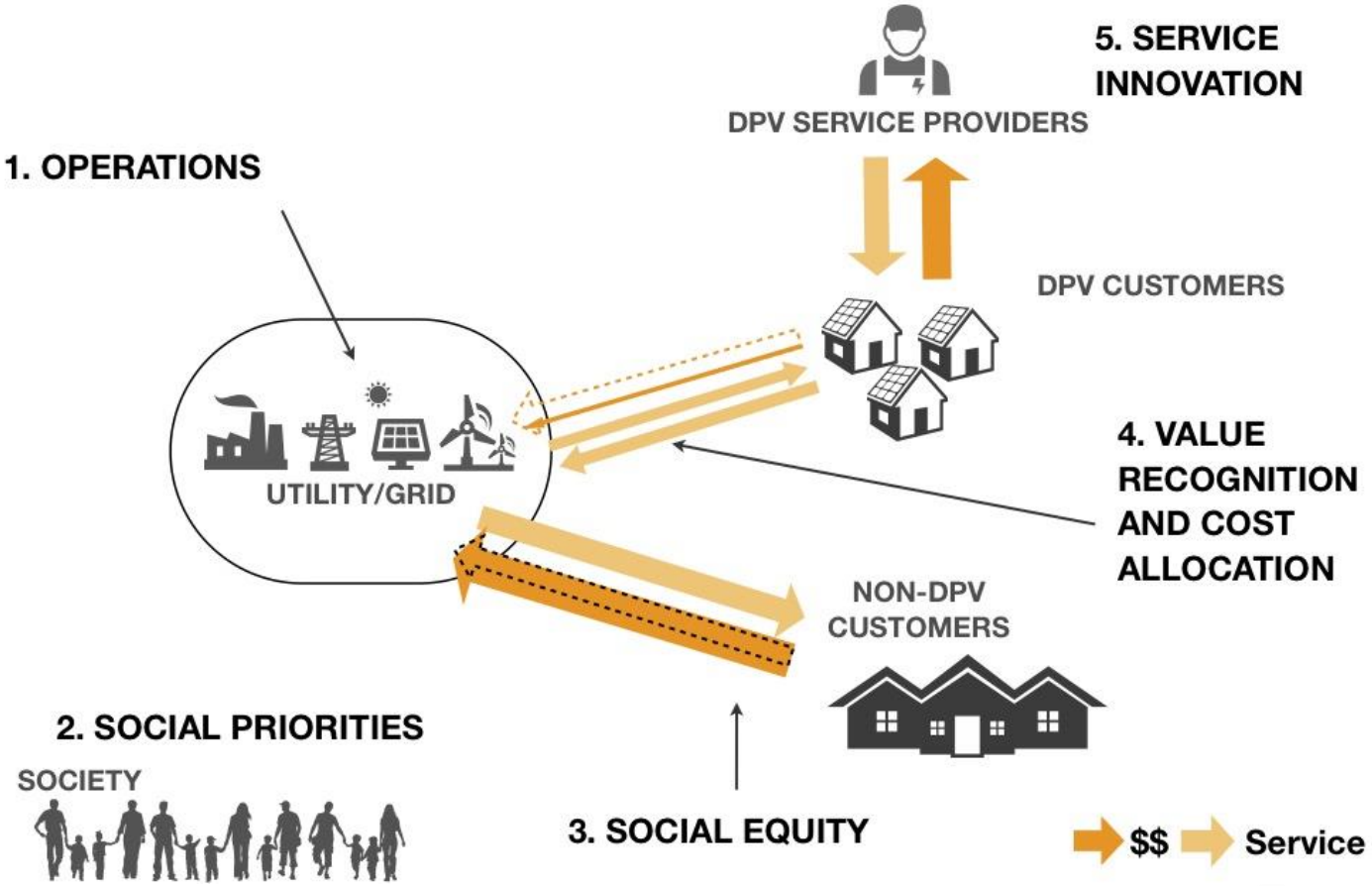


Distributed PV capacity installed in US



Source: Barbose, G.. 2014. *Tracking the Sun VII.* LBNL-6350E.; Bloomberg New Energy Finance; RMI Analysis.

Models designed for an historically centralized system are misaligned with distributed resource characteristics



What should the roadmap to new types of business models look like?

1 Establish Clear Foundation of Value

Identify and evaluate DER benefits and costs to the grid

Assess system operations implications

Ensure accountability, transparency, and verifiability for future stakeholder engagement

2 Align Pricing to Reflect Value

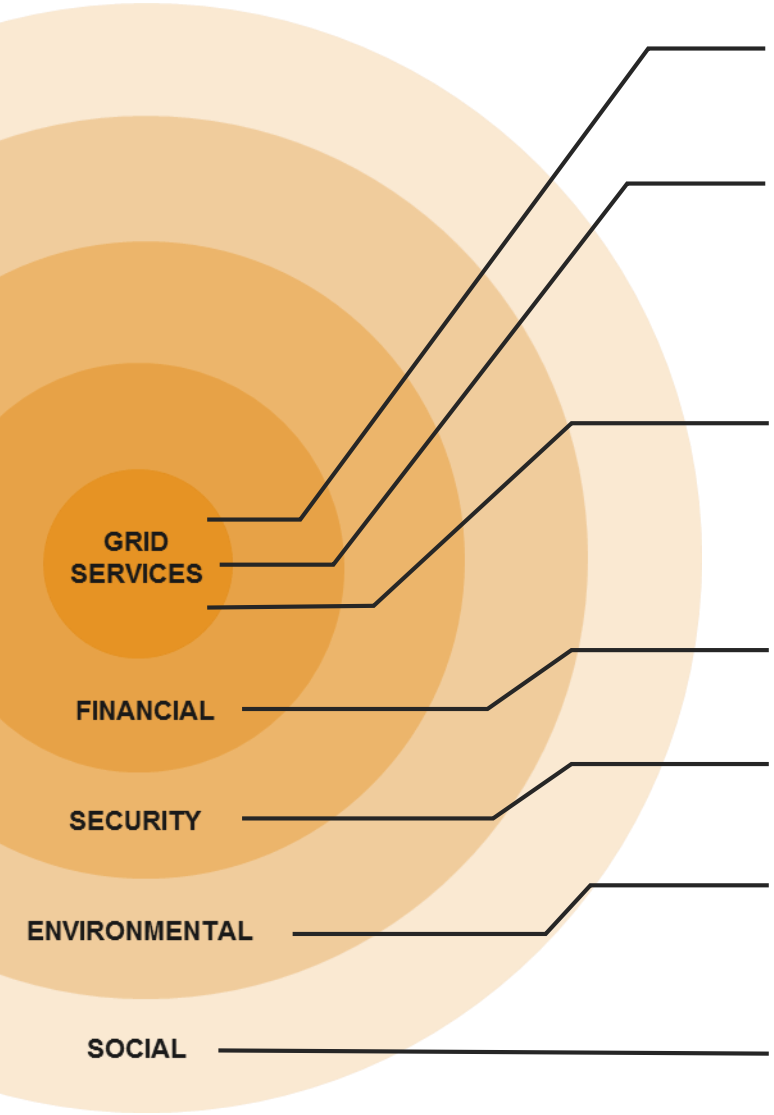
Integrate value foundation into pricing models that provide clearer signal to customers and fair compensation

3 Develop Business Model Opportunities

Leverage the combined strengths of utilities and third-party service providers to reduce total cost and increase benefits

Identify opportunities to capture increased value while creating positive outcomes for utilities, service providers, and customers

Efficiency and other distributed energy resources create real value in a variety of ways



ENERGY
- energy
- system losses

CAPACITY
- generation capacity
- distribution capacity
- transmission capacity

GRID SUPPORT SERVICES
- reactive supply & voltage control
- regulation & frequency response
- energy & generator imbalance
- synchronized & supplemental operating reserves
- scheduling, forecasting, and system control & dispatch

FINANCIAL
- fuel price hedge

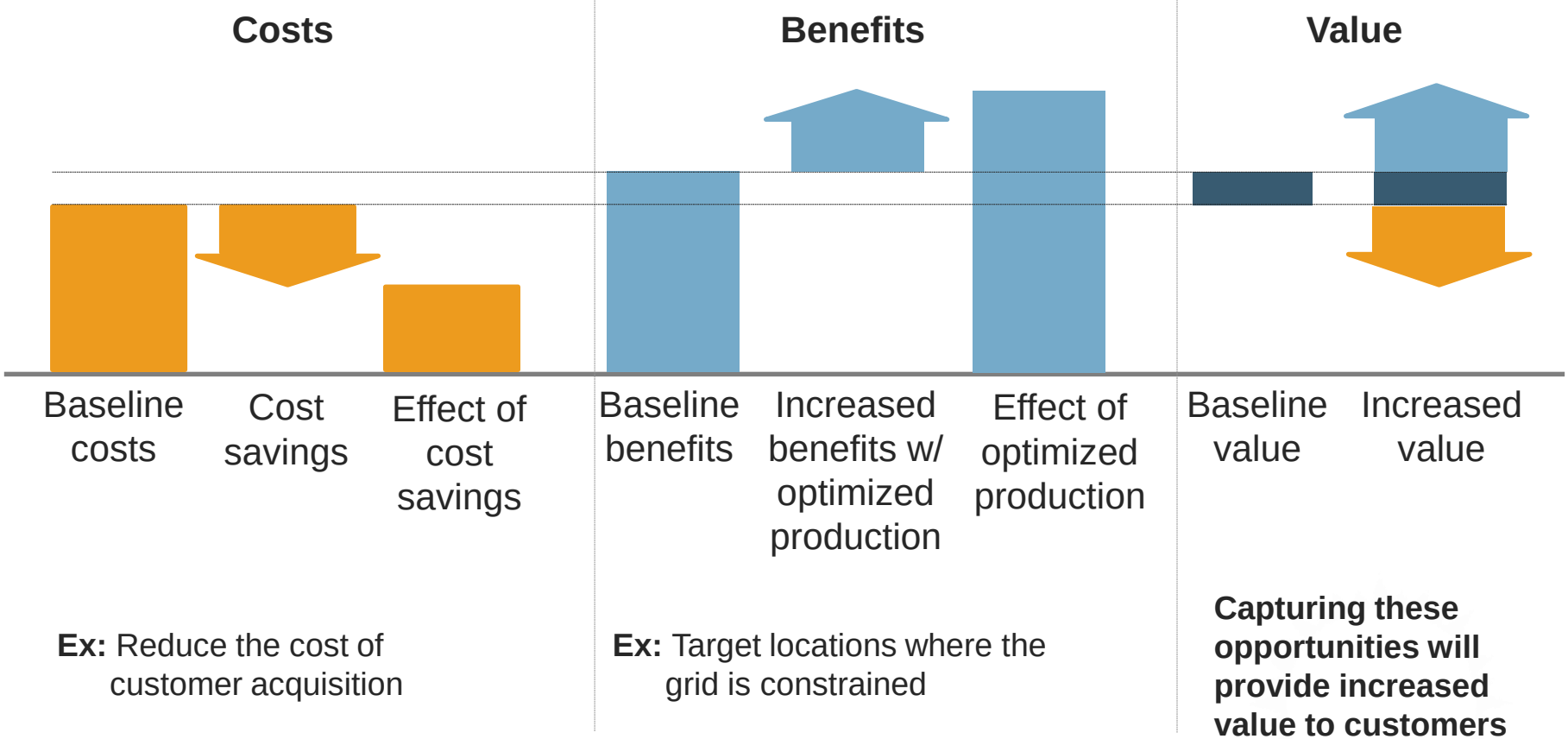
SECURITY
- resiliency

ENVIRONMENTAL
- CO_2 emissions
- criteria air pollutants (SO_x, NO_x, PM_{10}, etc.)
- water

SOCIAL
- economic development

There is significant opportunity to increase the value of distributed energy resources

Total resource benefits and costs [$/kWh]

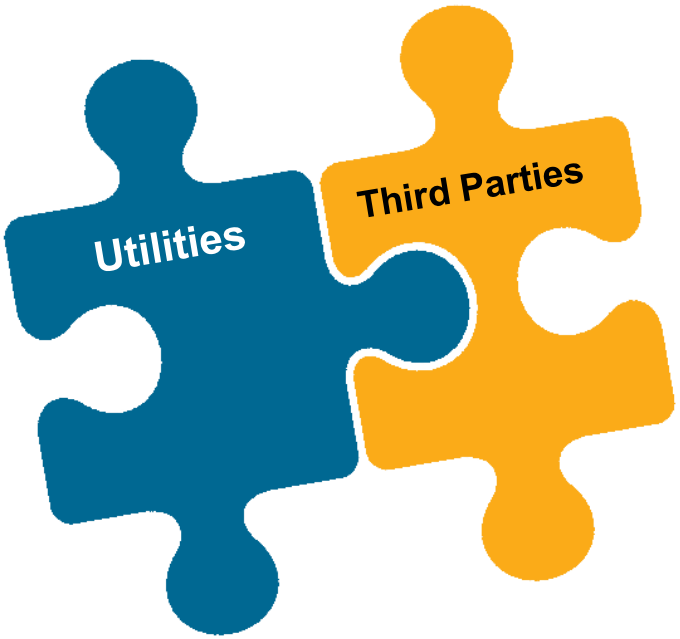


Ex: Reduce the cost of customer acquisition

Ex: Target locations where the grid is constrained

Capturing these opportunities will provide increased value to customers and the system

Collaboration between utilities and third parties will be critical to further reducing project costs



Key opportunities to reduce costs include:

- **Site identification**
  Share key data to make process much simpler, faster, and less-expensive
- **Customer acquisition**
  Leverage utility access to customers and brand strength to improve marketing and decrease customer concerns
- **Permitting, inspection, and interconnection**
  Streamline application process, co-develop clear equipment standards, and exchange interconnection information
- **Financing**
  Extend low-cost financing to broader customer segments
- **Billing**
  Improve customer experience and reduce administrative costs of billing systems

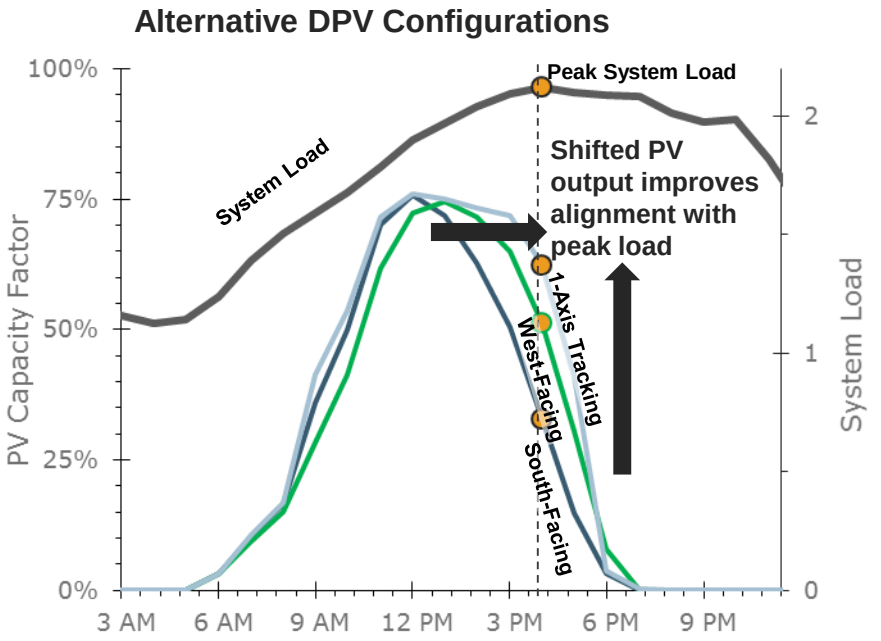
Opportunities to increase benefits

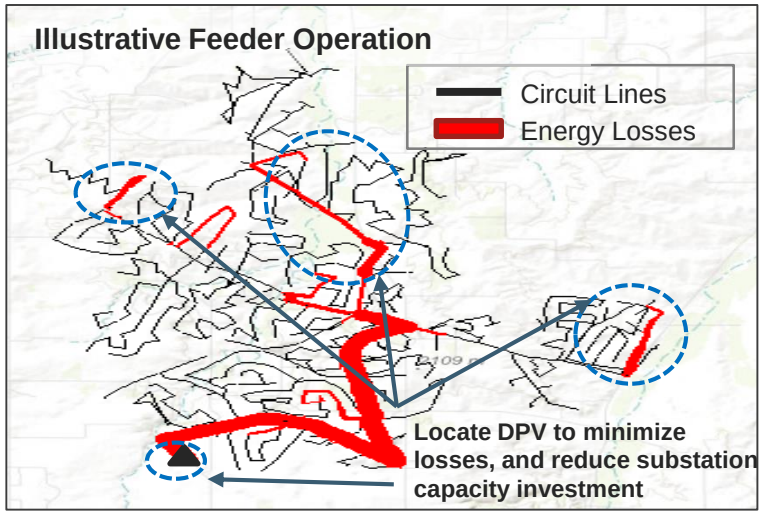
Optimize for capacity value:
Strategic project design can defer new capacity investments by:

- Increasing correlation of production with load
- Targeting locations where the system is constrained

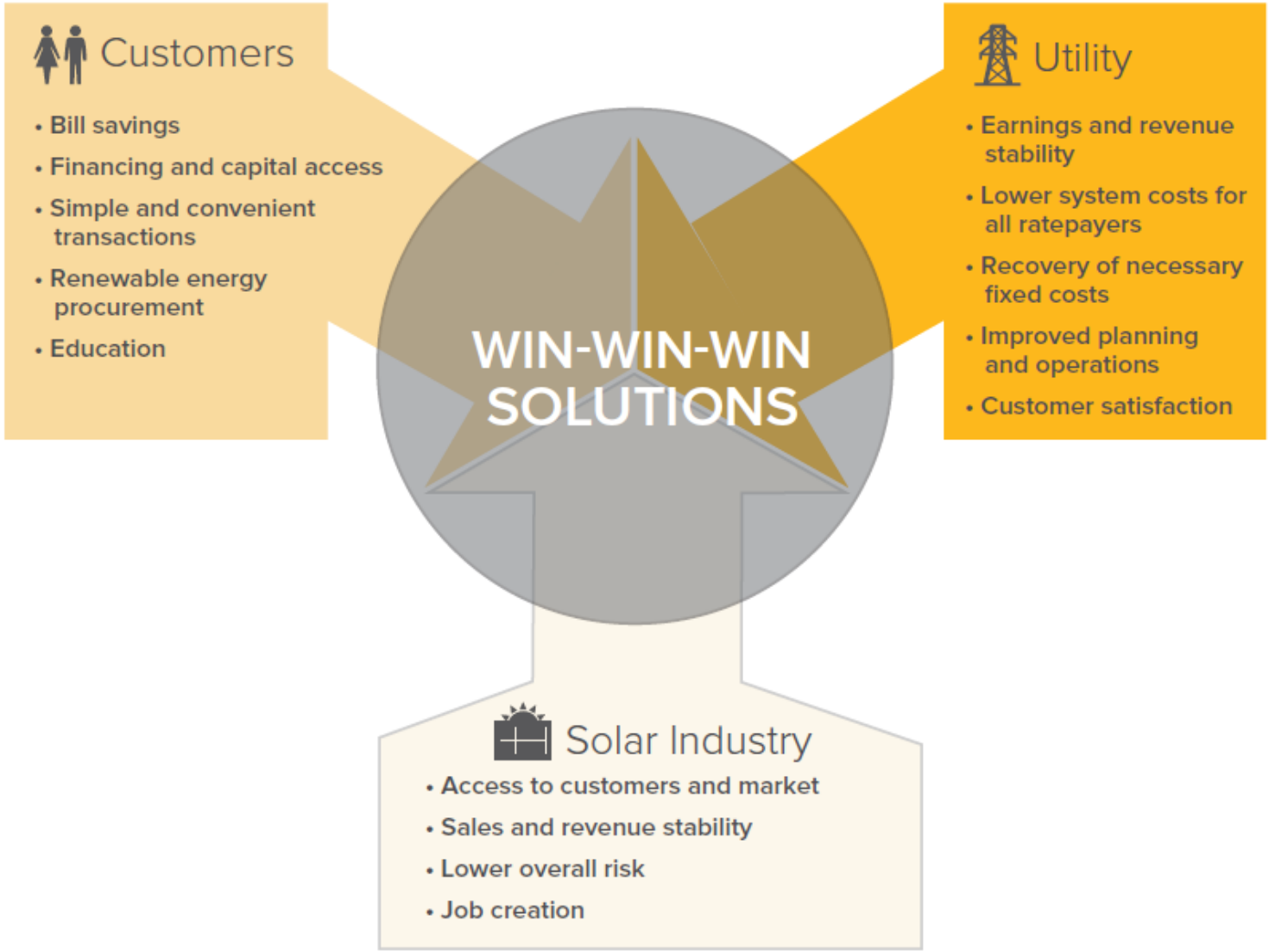
Provide additional grid services:
Add advanced inverters to offer additional grid support services, potentially increasing value by reducing operating costs and/or the need for other infrastructure

Integrate complementary technologies and programs:
Project bundling can maximize operational benefits by strengthening existing capabilities, and/or by providing additional grid services





Solutions to better capture value should seek to provide "win-win-win" solutions

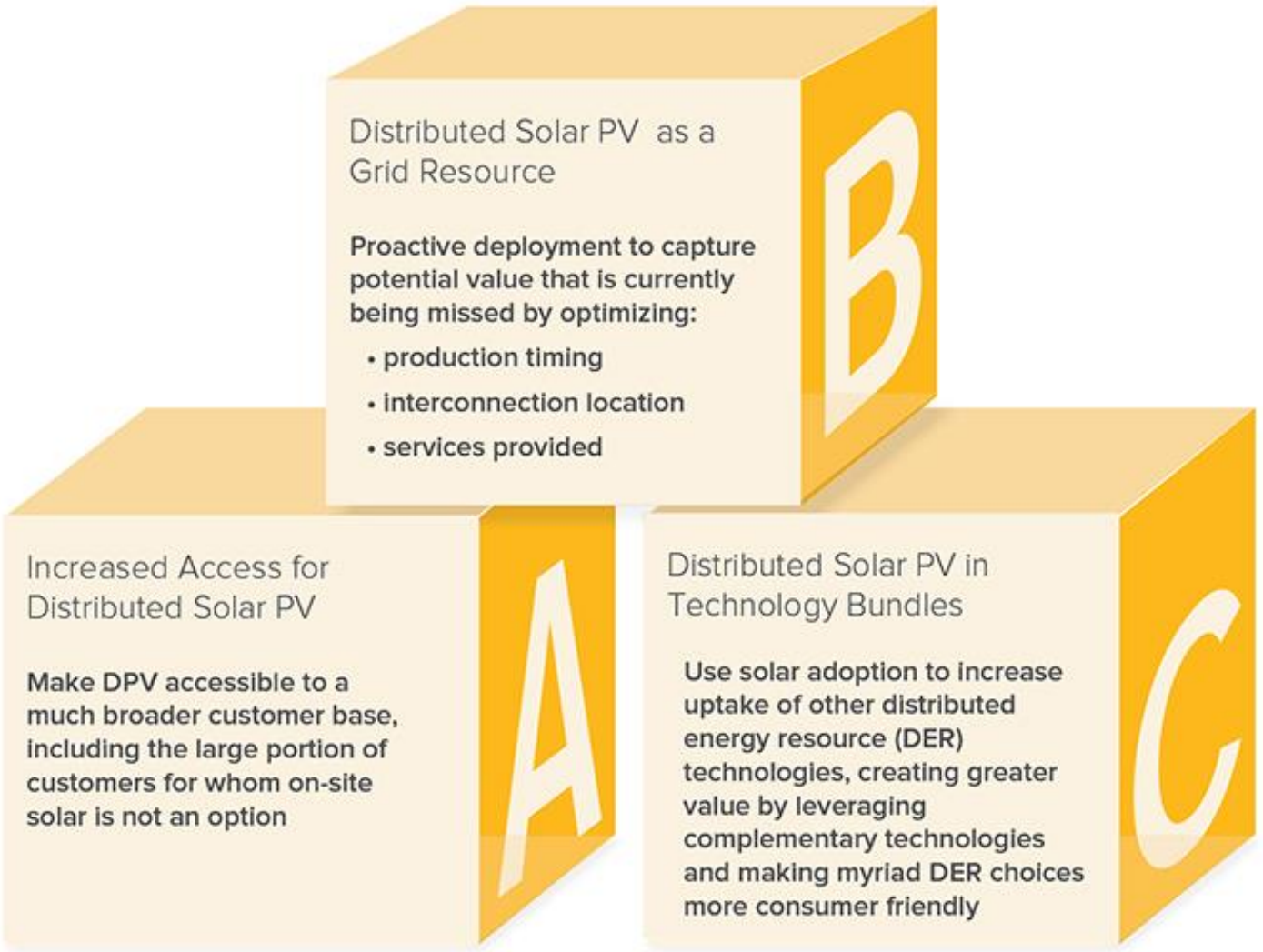


The spectrum of solutions for capturing value

	Pricing Realignment	Bridge Business Models	Regulatory and Business Model Reform
Description	Design pricing models that align customer incentives with the benefits and costs DERs provide	Adapt business models to increase and capture value within the existing regulatory paradigm	Redesign regulatory and business models to provide a platform for the economic and operational integration of DERs
Examples	• Time of use pricing • Energy + capacity pricing • Distribution “hot spot” credits • Real-time pricing • Attribute-based pricing • Distribution locational marginal pricing	• Increased access to DERs • Optimized deployment of DERs onto the grid • Technology bundles that provide energy services	• Energy services utility • Smart integrator • Independent distribution system operator • Resource finance aggregator

Bridge business models: creating win-win-win solutions

BUILDING BLOCKS FOR BRIDGE BUSINESS MODELS



One example: Bundling community solar with demand response

Steele-Waseca Electric Cooperative: The Sunna Project

Program Description

- Customer enters contractual agreement for up to 20 years and receives credits for generation
- A member who joins SWCE's water heating load control program can purchase 1 panel for $170 ($0.41/W). SWCE offers water heaters at no cost.
- Additional panels cost $2.99/W.

Benefits

- Increases member satisfaction while minimizing cross-subsidization among members
- Provides SWCE with substantial load flexibility
- Expects 2/3 of participants will be adding electric load

THE SUNNA PROJECT



Next steps for developing and supporting new DER business models

- Assess current abilities to identify value and customer needs
- Develop a transparent, multi-stakeholder process to create a standardized methodology, evaluate value, and share results
- Determine approaches for optimizing and capturing value
- Assess pilots and refine solutions

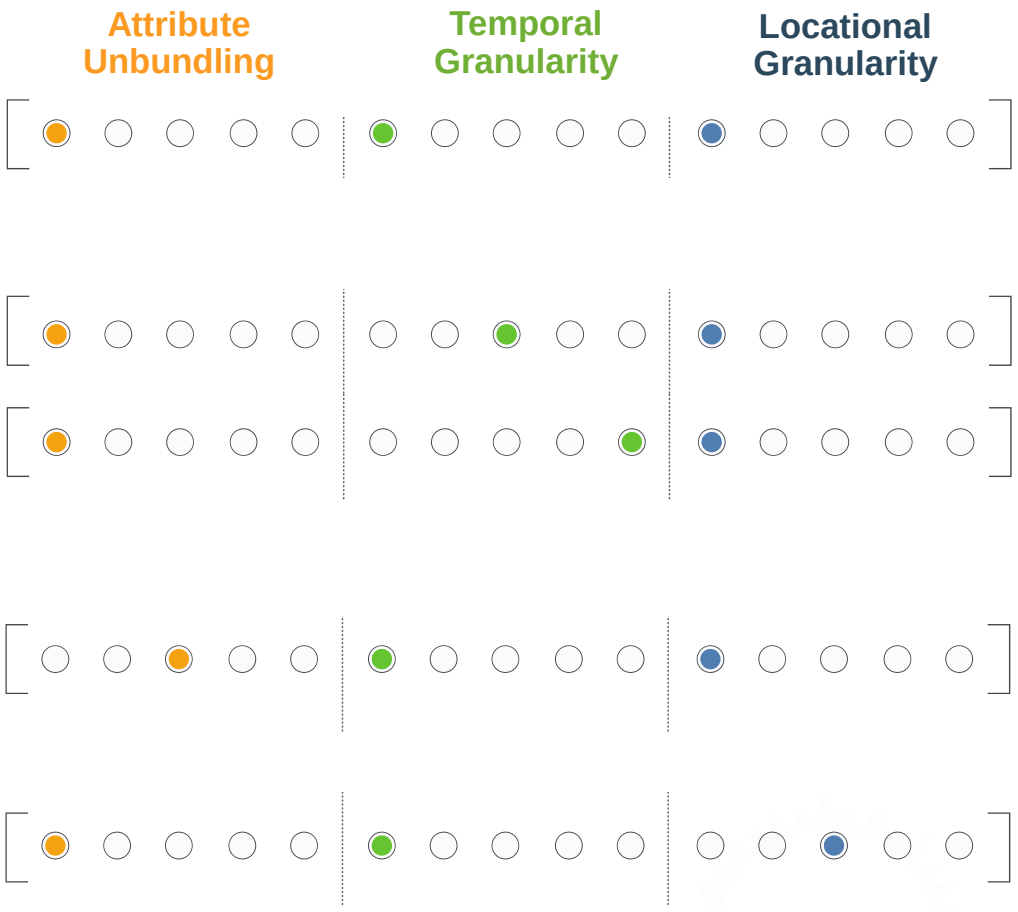






Creating a clean, prosperous, and secure energy future™

Pricing realignment: Unbundling along three spectrums can unleash innovative products and services



Today's block pricing is fully bundled, with no time- or location-based differentiation

Time-of-Use Pricing represents a viable near-term solution that represents greater temporal granularity…

…while **Real-Time Pricing** represents a subsequent option with even greater temporal granularity

Energy + Capacity Pricing (Demand Charges) represents a viable near-term solution for attribute unbundling…

… and **Distribution Hot Spot Credits** represent a viable near-term solution for locational granularity

There are multiple viable near-term solutions, as well as more sophisticated longer-term options

Emerging models of more fundamental regulatory reform

- Performance-based regulation
- Independent distributed network operator/distributed system platform
- Energy services utility
- Smart integrator
- Resource finance aggregator

