

# Reimagining the Utility

Evolving the Functions and Business Model of  
Utilities to

**Adapt to Changing Times**

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Meteorology and Market Design for Grid Services Workshop



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# RMI's programs span sectors and geographies



# WHAT RMI DOES



Identify Market-based Low-carbon Solutions to Tough Problems



Engage Businesses, Communities, and Institutions



Employ Rigorous Research, Analysis, and Whole-systems Expertise



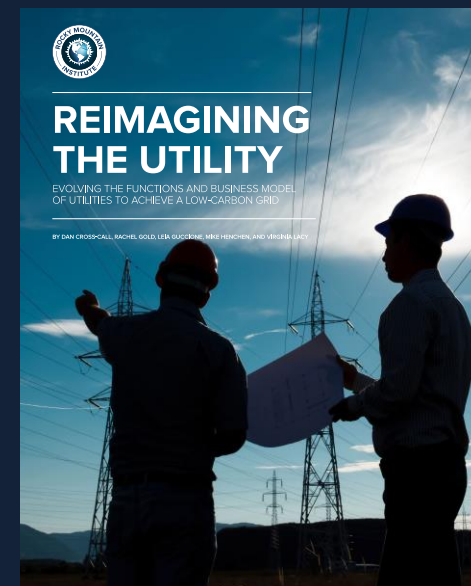
Convene and Collaborate with Diverse Partners



Accelerate and Scale Solutions

# Reimagining the Utility

## New Business Models for a New Age





# U.S. utilities face a convergence of pressures

Load has stopped growing and is likely to remain flat

Social objectives have expanded and become more complex, especially around climate change and resilience

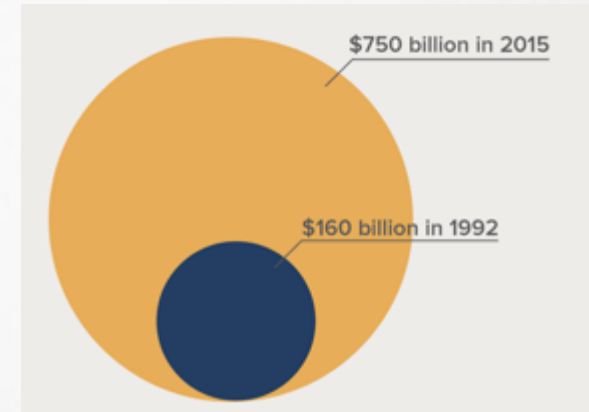
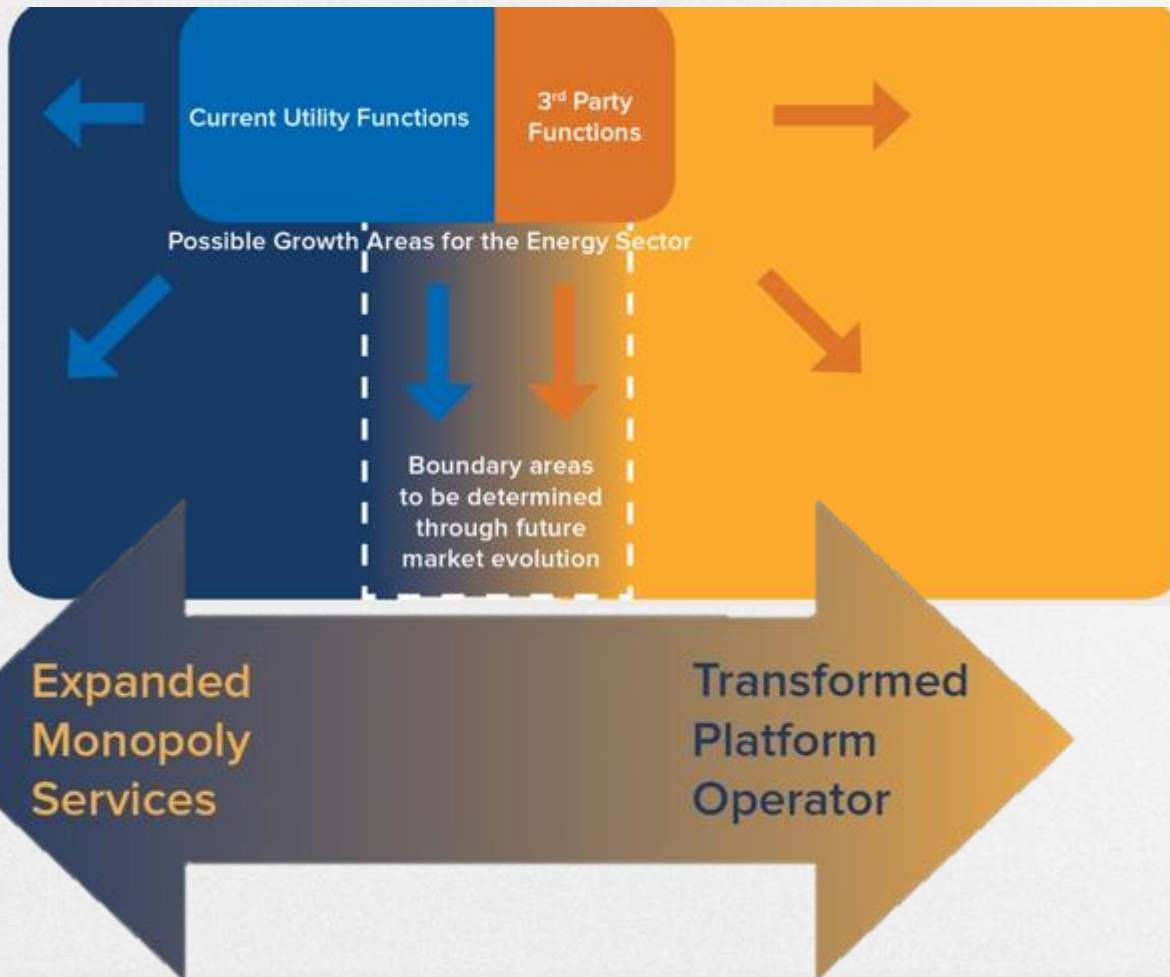
Regulators (in some states) are pressuring or forcing utilities to open monopoly functions to more competition

Explosion of distributed resources has given customers more choice and complicates grid management, especially rooftop solar and electric vehicles

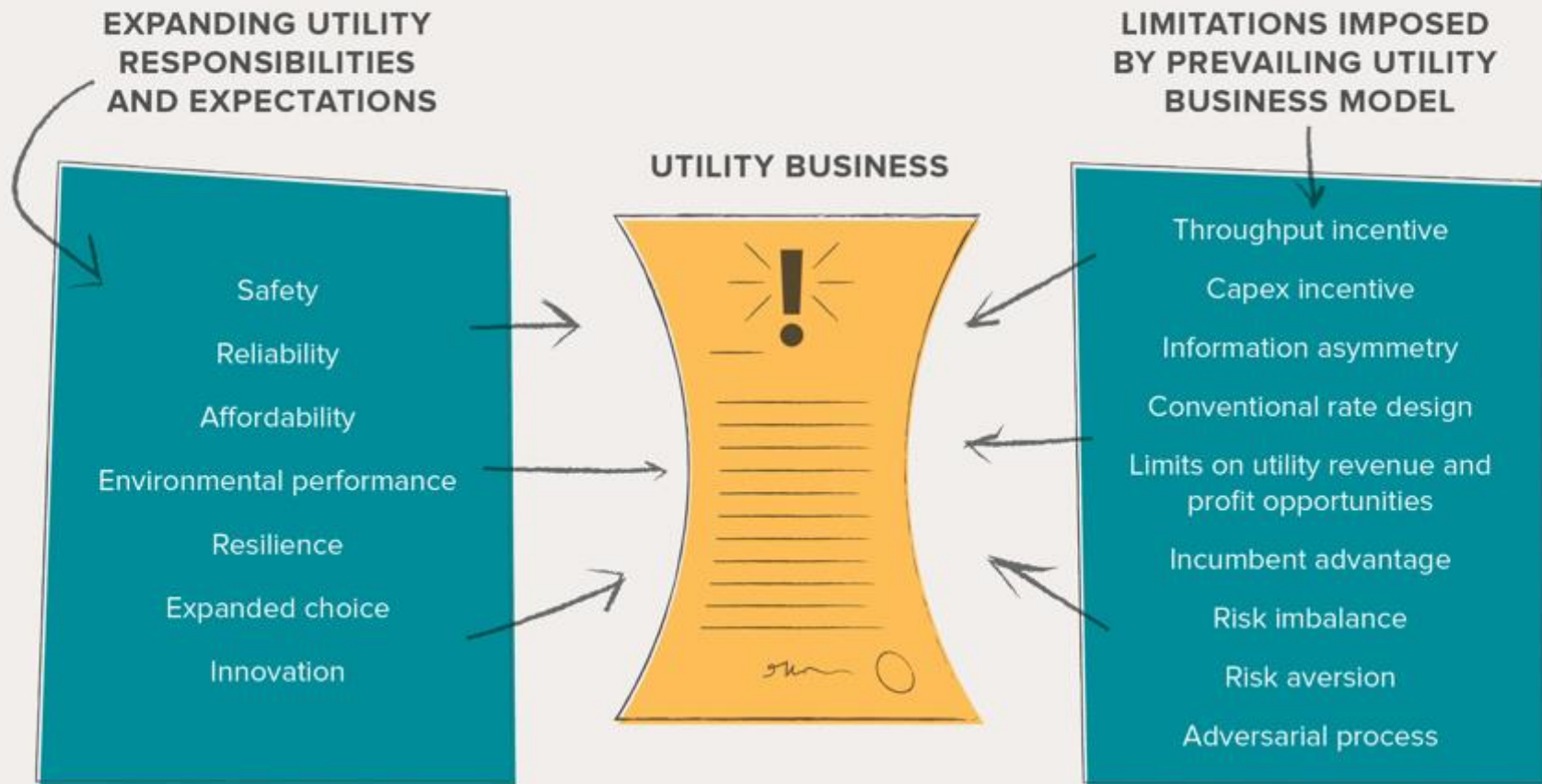
# New service capabilities, combined with changing customer expectations, brings expansive new business opportunities

Market and technology trends present strategic choices for utilities, regulators, and other stakeholders

Growth in telecom market size since deregulation and market reform



# New opportunities have emerged for utility service improvement and value creation, but structural limitations prevent adaptation and utility evolution





# A growing stable of reform options are available to realign utility business practices

## I. Adjustments to the Cost-of-Service Model



Revenue Decoupling

Multi-year Rate Plans

Shared Savings Mechanisms

Performance Incentive Mechanisms (PIMs)

## II. Leveling the Playing Field



Changes to Treatment of Capex/Opex

New Procurement Practices

## III. Retirement of Uneconomic Assets



Securitization

Accelerated Depreciation

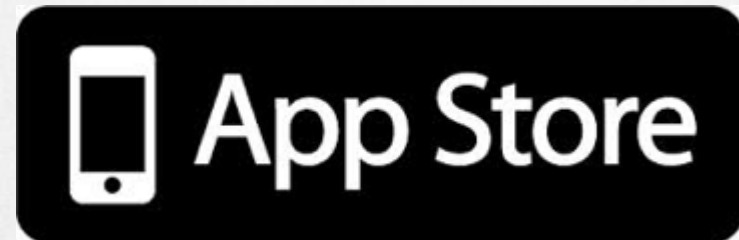
## IV. Reimagined Utility Business



Platform Revenues

New Utility Value-Added Services

# Platform businesses abound in the modern economy



*What defines the platform? Physical infrastructure? Information technology?*

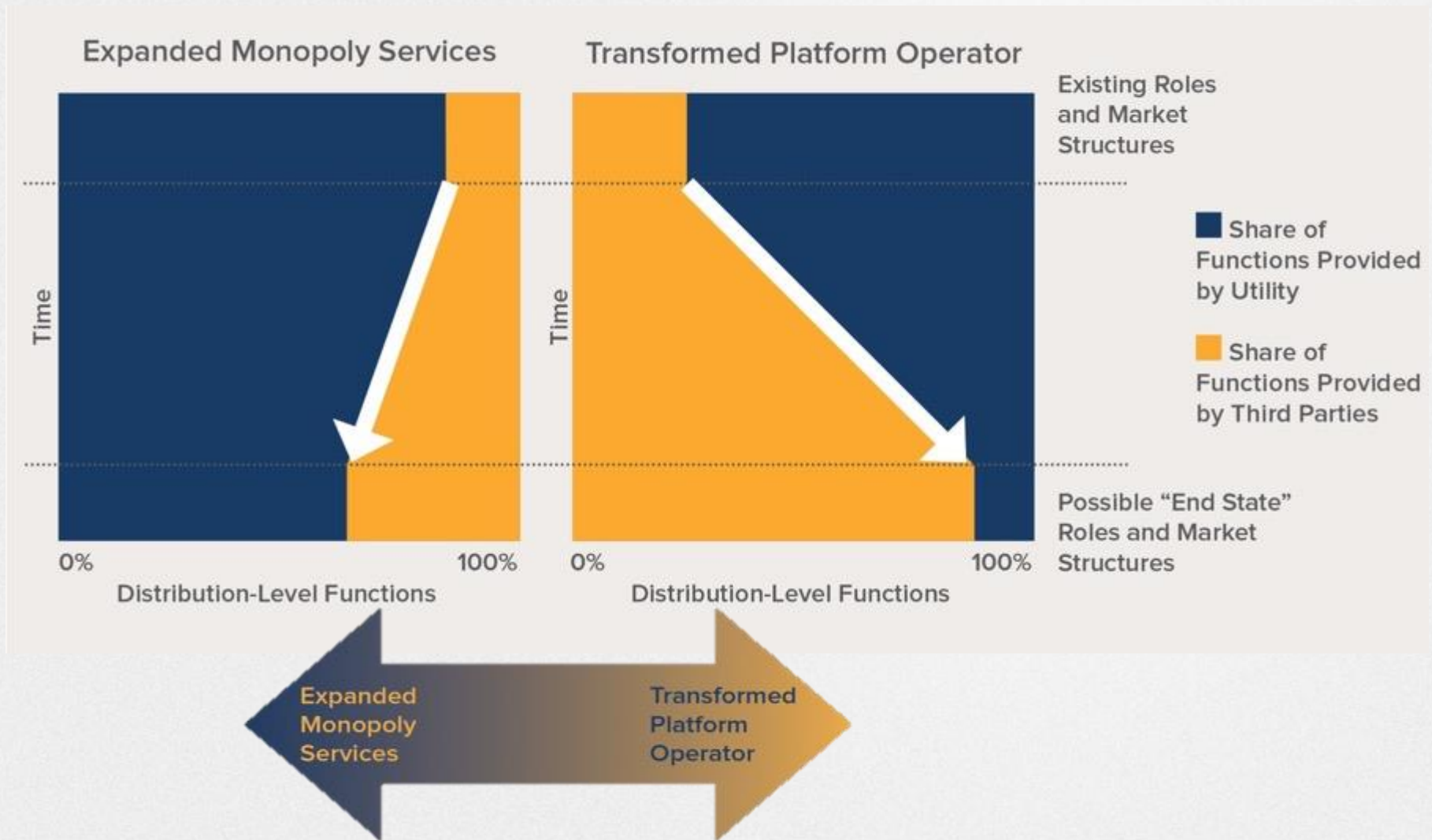
# Hybrid models exist between the relative extremes of an *expanded monopoly* and *platform utility*

What model is attractive to your business? What do you do today?

	Utility Procurement of 3 <sup>rd</sup> -Party Solutions	Split Roles by Product or Scope of Activity	Utility Competition with Third Parties	Utility-Hosted "Microplatforms"
Opportunities	<ul style="list-style-type: none"> <li>• Specialization from outside the utility</li> <li>• Clean energy portfolios</li> <li>• Cloud computing and Software-as-a-Service</li> </ul>	<ul style="list-style-type: none"> <li>• Competition to encourage innovation</li> <li>• Invite utility into underserved markets</li> </ul>	<ul style="list-style-type: none"> <li>• Leverage utility advantages while encouraging innovation</li> </ul>	<ul style="list-style-type: none"> <li>• Innovation districts for cities or campuses</li> <li>• Testbed for experimentation</li> </ul>
Examples	<ul style="list-style-type: none"> <li>• SCE procurement of Nest thermostats for demand response</li> </ul>	<ul style="list-style-type: none"> <li>• Restrictions on utility participation in PV</li> <li>• Allowance for rate-based EV charging infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Tesla Powerwall offered by Green Mountain Power</li> </ul>	<ul style="list-style-type: none"> <li>• Spokane University District by Avista</li> </ul>
Challenges	<ul style="list-style-type: none"> <li>• Capital bias makes some new solutions unattractive (e.g., opex alternatives)</li> </ul>	<ul style="list-style-type: none"> <li>• Difficult to predict which services may be competitive in the future</li> </ul>	<ul style="list-style-type: none"> <li>• Incumbency advantages by utility can chill market</li> </ul>	<ul style="list-style-type: none"> <li>• Challenge to develop customized market rules and settlement structures</li> </ul>



# Regardless of the model, an increasing share of functions are likely to be performed by third parties



# The path to a reimagined utility comes down to some big decisions—and countless small ones





# State Snapshots

New York, Hawaii, Vermont



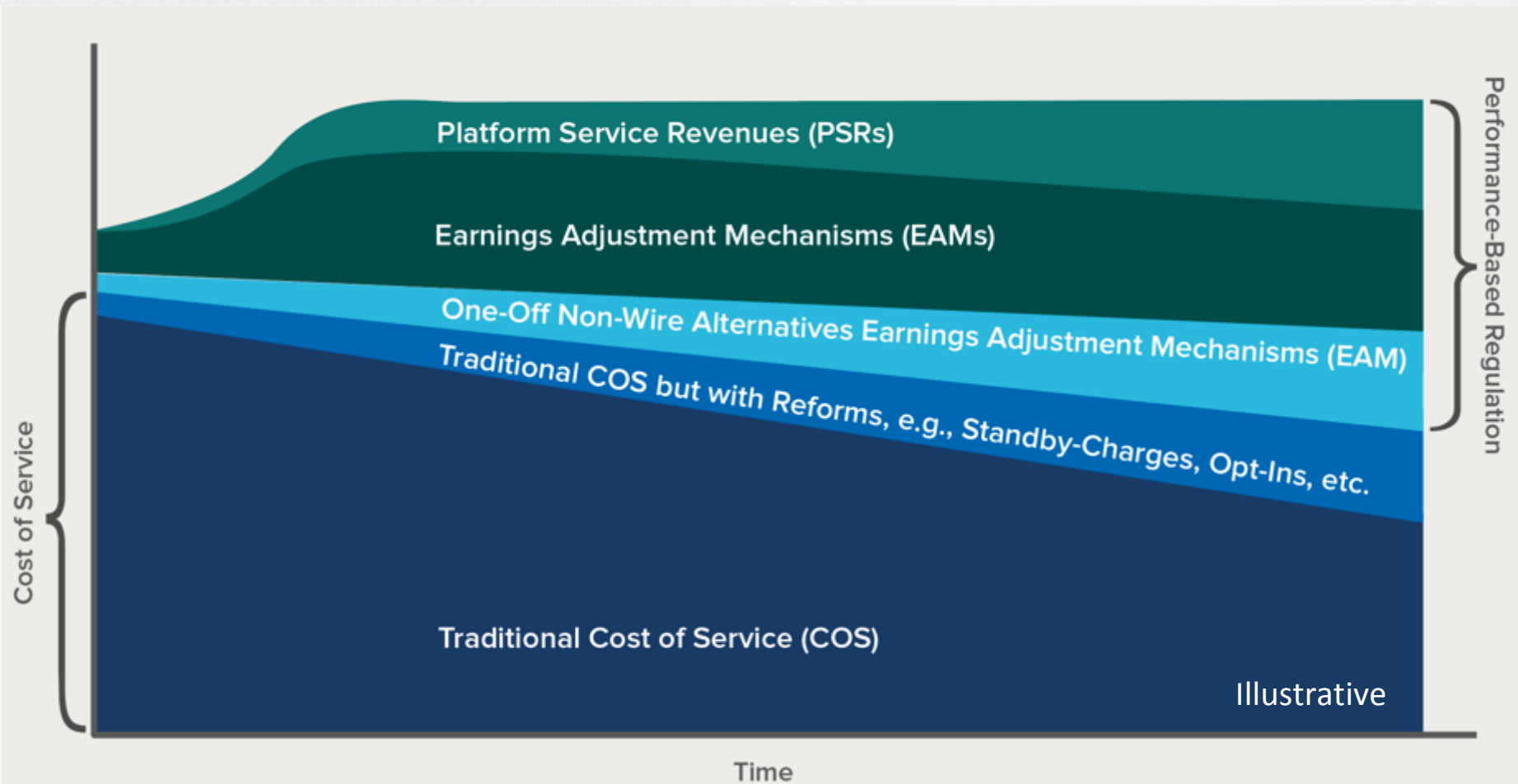
# New York REV provides one example of where we might take market and utility design

In the future, customer-sited DER assets will be available in a competitive marketplace hosted by utility DSPs, reimagining traditional utility roles and relationships

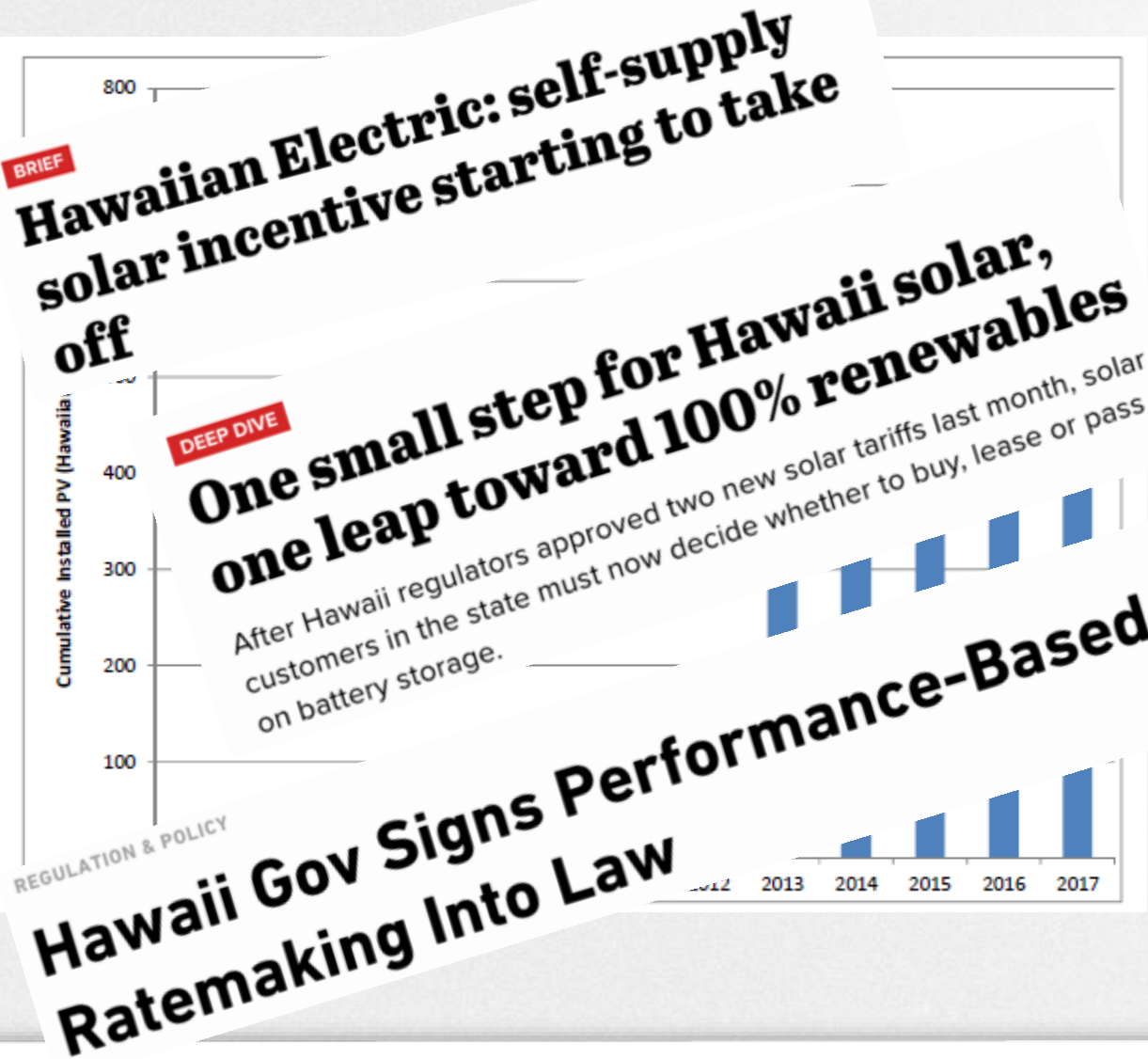
Direction for DER Programs under REV



# New York regulators have put forward a bold vision for what a different utility business model could entail



# In Hawaii, high PV growth and 100% RPS are driving fundamental changes in the utility business model



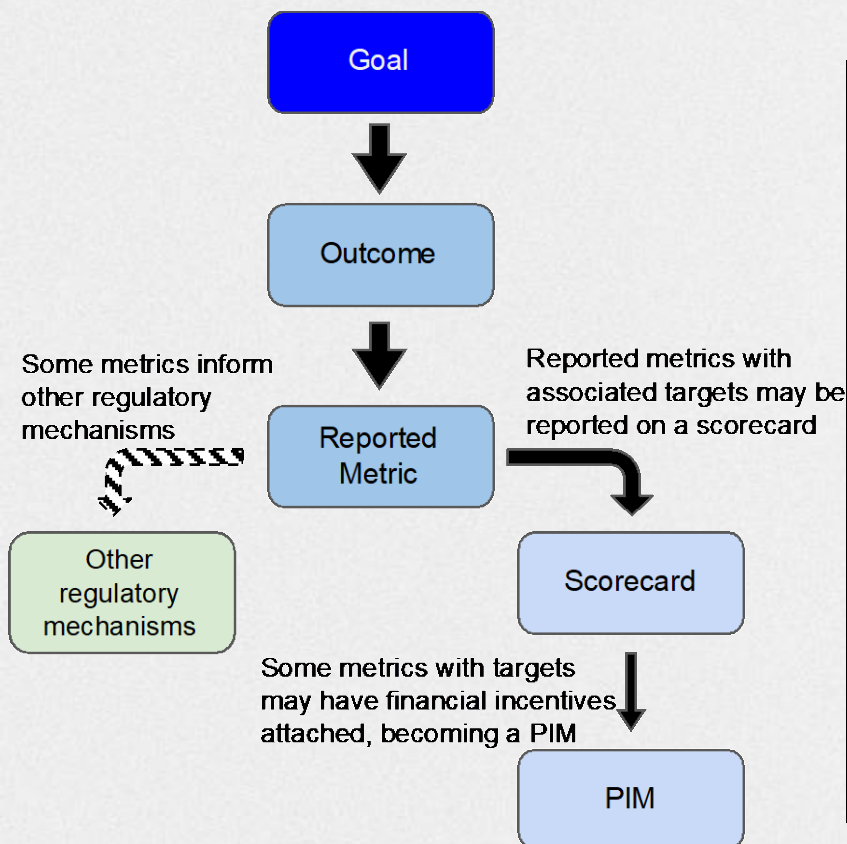
The **Commission's 2014 Inclinations** report set out a guiding vision for Hawaii's electricity system, and how Hawaii's future utility business model could better align with customers' interests and policy goals, including:

- **Harness DER** to optimize the system and maximize customer benefits
- Develop **unbundled rate structures and price signals**
- **Modernize the utility business model**, including potential for *platform integrator*



# Hawaii is in the middle of a 2-year proceeding to develop performance-based regulation for its investor-owned utility

## Approach to PBR in Hawaii



## Proposed Outcomes for Further Attention in PBR Development during 2019

Regulatory Goal	Regulatory Outcome	
Enhance Customer Experience	Traditional	Affordability
		Reliability
	Emergent	Interconnection Experience
		Customer Engagement
Improve Utility Performance	Traditional	Cost Control
	Emergent	DER Asset Effectiveness
		Grid Investment Efficiency
Advance Societal Outcomes	Traditional	Capital Formation
	Emergent	Social Equity
		GHG Reduction
		Electrification of Transportation
		Resilience

# Utilities and other organizations in Hawaii also work with innovative groups such as Elemental Excelerator

Partnerships provide a pipeline of new solutions for DERs and other technologies

Elemental Excelerator is a non-profit growth accelerator helping startups change the world, one community at a time. Each year, we find 15-20 companies that best fit our mission and fund each company up to \$1 million for improving systems that impact people's lives: energy, water, agriculture, mobility, and beyond.

Our mission is twofold:

1. Help startups succeed and
2. transform communities.

Help startups  
succeed

Transform  
communities

GLOBAL & INNOVATION  
PARTNERS

TRIPLE-TRACK PROGRAM

COMMUNITY PARTNERS  
(EEX HUI)

TRANSCENDING OIL

We surround startups with partners that can help them deploy locally and scale globally.



nationalgrid



TEPCO



centrica

Orsted



HITACHI  
Inspire the Next



# Incubators and accelerators around the world

## GLOBAL MAP OF ACCELERATORS AND INCUBATORS

**78** INDUSTRY LEADERS  
**53** ORGANIZATIONS  
**20** COUNTRIES





# Green Mountain Power is on the cutting edge of the energy transformation



## Green Mountain Power

- Serves 265,000 customers in Vermont
- Names “The Most Innovative Company in Energy” by *Fast Company*



First utility to become a certified B Corporation, formalizing the commitment to customers and other stakeholders



Reaffirmed a “customer obsessed” culture and vision as “Vermont’s energy transformation company”



Launched innovative customer programs: eHome holistic energy makeovers, Tesla Powerwall, cold climate heat pumps, and more

# GMP compensates customers for optimized DER dispatch – starting with storage



## Powerwall program

- GMP provides and finances Tesla Powerwall batteries to residential customers
- Customers pay \$15/mo, which reflects a ~\$60/mo equipment cost, less the ~\$45/mo in value GMP gains from optimizing battery dispatch
- Customers gain backup power in the event of grid outage

## GMP optimizes for three value streams in battery dispatch



**ISO New England peak reduction:** GMP reduces demand during the ISO system-wide peak, reducing its needs in the forward capacity market

**Local transmission peak reduction:** GMP manages monthly peaks to reduce transmission expenses

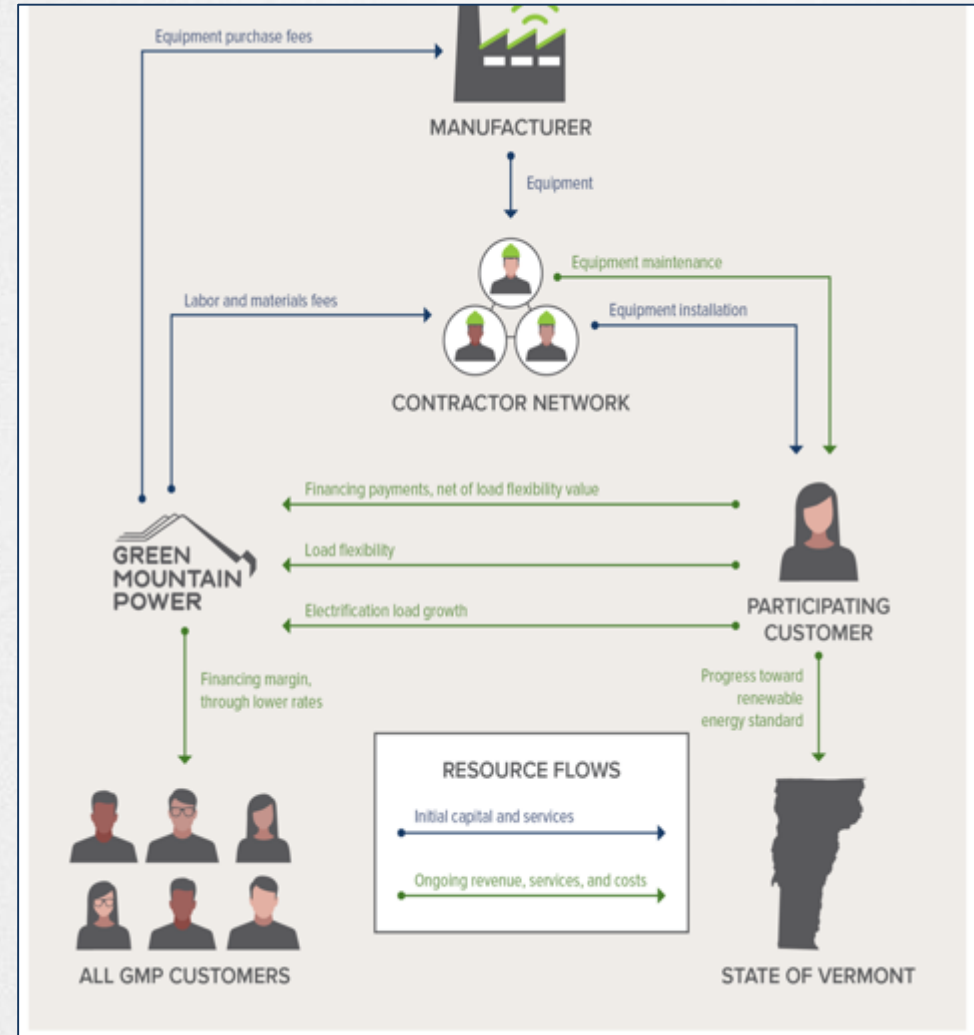


**Energy arbitrage:** GMP charges and discharges to capture value from the spread in locational marginal pricing

# Green Mountain Power offers a vision to both create and capture value through beneficial electrification

## Business Model Features

- GMP procures heat pumps, using local contractors for installation, and leases equipment to participants
- *Up-front cost* of heat pump captured in GMP rate base
- *Financing payments*: from participants return to customers by offsetting some of GMP's annual revenue requirement, and are structured to return a net benefit to all customers
- *Electrification*: Equipment replaces fossil fuel systems, generating new electricity sales, which spreads fixed costs of grid, improving bill affordability
- *Load flexibility*: devices managed to shift load to most beneficial times of day can help keep bills affordable



# Strategic electrification of loads can be a new revenue source

## GMP supports electrification of heating and mobility



**Cold climate heat pumps:** GMP provides financing with on-bill payment, manages installation, and offers demand response



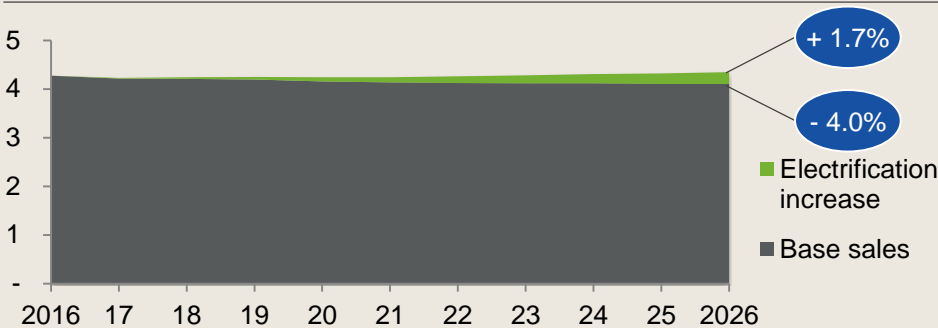
**Heat pump water heaters:** GMP offers lease with on-bill payment and manages installation



**Electric vehicles:** GMP offers free level 2 chargers and discounted off-peak charging

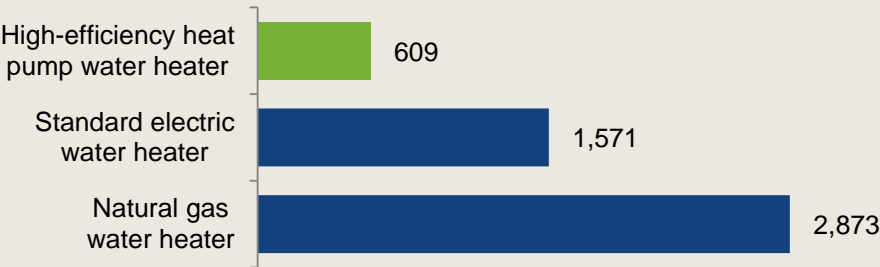
## Electrification can help reverse declining demand

GMP energy sales forecast, TWh



## With GMP's low-carbon generation mix, electrification reduces GHG emissions

Annual CO<sub>2</sub> emissions for typical residential water heaters in GMP service area, lbs CO<sub>2</sub>





# Change happens fast. Just ask the carriage industry.

Easter Parades on Fifth Avenue, New York 13 years apart

1900: where's the first car?



1913: where's the last horse?





# Thank You

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