PBR: Applications and Future

Michigan PSC
PBR Collaborative

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DTE Energy

Agenda

- Basic Definitions
- PBR Alignment with Policy/Regulatory Goals
- PBR and Incentives
- Benchmarking Findings
- Michigan: Scope of PBR Going Forward

PBR Defined

Semantics and labeling sometimes create obstacles in dialogues concerning PBR

- Frequently used synonymously with Incentive Regulation
- No single official definition, but general agreement that PBR refers to rate-setting frameworks that create a stronger connection between a utility's achieved returns and its:
  - Performance overall; and/or
  - Performance in specific areas
- For purposes here: we are adopting a broadly encompassing definition of PBR under which a regulatory mechanism(s) provides incentive for utilities to achieve policy goals – cost/price related or otherwise

PBR-Goal Framework

PBR framework should be designed to address specific issues, problems and/or policy goals, and reflect jurisdictionally unique circumstances

Goal	Incentive Area	PBR Mechanism
Cost / Price Control	Overall financial performance	**Broad-based Incentive Frameworks** MRP/ARM Price Cap Revenue Cap
Targeted Areas of / Changes In Performance	"Traditional" operational areas (e.g., SAIDI) "Emerging" performance targets (e.g., EAMs)	**Narrower Incentive Mechanisms** PIMs
(Expedited) Investment (e.g., Grid Modernization, Reliability, Resilience)	Risk Reduction	**Supplemental Incentives** (e.g., Capex Trackers/Riders, Formula Based Rates)

PBR – A Starting Point

Most surveys / benchmarking studies cover two primary areas of PBR:

- Multi-year Rate Plans (MRPs)
  - Broad-based incentive frameworks tend to strengthen cost-control incentives
  - So-called (price or revenue) "cap" plans, using
    - Rate freezes
    - I – X, or
    - Preset "stair step" adjustments
- Performance Incentive Mechanisms (PIMs)
  - Also referred to as Targeted Performance Incentives (TPIs)
  - Narrower incentive mechanisms focused on specific outputs (e.g., reliability)
  - Incentives are aligned with specified areas of performance

Incentives in MRPs and PIMs

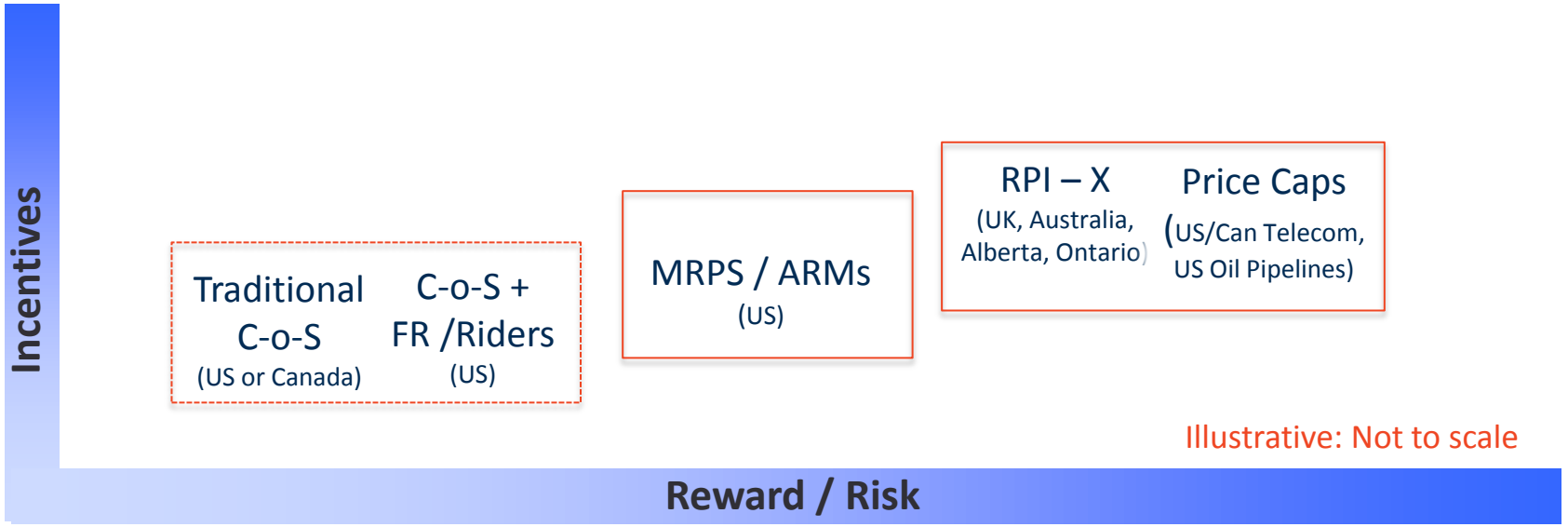
Incentives are typically considered in terms of the opportunity for utilities to earn additional profit

- MRPs: Incentives are tied to a utility's opportunity to "beat" reasonably set cost projections through
  - Managerial efficiency and/or
  - Innovation
- PIMs: (Dis)incentive are tied to meeting operational targets (e.g., SAIDI) – they tend to be centered on penalty avoidance

Borders of PBR

Regulators and policymakers have a range of views as to where traditional regulatory frameworks end and where PBR begins

- "All regulation is incentive regulation", (attributed to) Kahn
- "The contrast […] is mostly one of emphasis", Laffont and Tirole
- Riders and formula rates are typically viewed as supplements to traditional regulation; price/revenue caps are typically considered to be further removed



Incentives in Context

Earnings opportunities are not always fully aligned in theory and in practice

- While there is opportunity for utilities to earn additional profit, it may not be as significant in practice as it is in concept
  - Electric utilities have experienced low Total Factor Productivity (TFP) since the 1980s – which is a primary determinant of the X factor
  - May be moderated by earnings sharing or collars
  - PIMs are asymmetrical downward
- Some regulators view MRPs more of a (rate case) resource necessity, more than PBR, per se

Benchmarking Findings

Composition of PBR

- Surveyors and analysts necessarily decompose regulatory frameworks into component parts as part of the benchmarking process
- Most of the regulatory frameworks are widely considered to be PBR are not "pure plays," but are combinations of traditional regulatory and incentive elements

Summary of PBR Elements For Selected Case Studies

			MRPs			TPIs			
Utility	State	Traditional CoS	Stair-step Trajectory	"I – X" Revenue cap	"I – X" Price cap	Traditional	Emerging	Formula Rates	Broad Capex Mechanisms
ATCO Electric	Alberta, Canada				✓				✓
ATCO Gas	Alberta, Canada			✓					✓
Ausgrid	NSW, Australia			✓		✓	✓		✓
ComEd	IL, US							✓	
Con Edison	NY, US		✓			✓	✓		
FPL	FL, US		✓						
NGN (RIIO)	England, UK			✓		✓	✓		✓
NPg (RIIO)	England, UK			✓		✓	✓		✓
PG&E	CA, US		✓						
PSE&G	NJ, US	✓							✓
Xcel Energy, NSP	MN, US		✓						

Benchmarking Findings

"Leading" PBR Applications

- The more "ambitious" PBR frameworks have been applied outside of the U.S.
  - Tend to have longer period between rate cases than U.S. plans
  - Tend to be structured comprehensively by combining:
    - Revenue or price caps
    - Outcome oriented PIMs
    - Supplementary incentive mechanisms; e.g., to promote investment
  - Most widely cited: RIIO in Great Britain; also frameworks in Australia and Canada
- Even here, PIM designs tend to reflect legacy focus on cost and traditional aspects of utility operations …
- … Although they are expanding to include newer policy related outcomes; e.g., environmental and interconnection issues

U.S. Survey

MRPs and PIMs are the most common forms of PBR in the U.S.

- MRPs usually include annual adjustments, with preset stair steps more prevalent than I-X frameworks
  - Can be likened to multi-test year rate cases
  - Moderates frequency of rate cases and provides predictability / rate stability
  - May include earnings sharing mechanisms (ESMs)
- PIMs are also applied in some form or measure
  - "Traditional" PIMs cover routine and recognized areas of utility operations (e.g., reliability and customer service)
  - Most are asymmetrical downward fashion (i.e., penalty-only), based on premise that targeted service levels reflect point where marginal costs and benefits align (MB = MC)
  - Argument can be made for symmetrical treatment if MB>MC, due to changes in consumer preferences and applications

Back To Goals

- MRPs and PIMs fill important jobs…but not all jobs
  - Main job: Cost/price moderation + service quality
  - A bedrock measure of regulatory effectiveness
  - Remains important, but particularly relevant in a fully regulated utility environment
- The scope of policy goals is expanding, in step with industry evolution towards a Utility of the Future (UoF) ecosystem
  - Increasing attention given to Emerging PIMs
  - Incentives may need to be revised to promote utilities taking actions in areas that may not be in their near-term financial best interests
  - Also, need for mechanisms to promote investments in grid modernization and resilience

Benchmarking Findings

U.S. – "Newer" Applications

- Newer (emerging) PIMs include incentives for utilities to, e.g., reduce emissions / carbon footprint, and improve asset utilization / system efficiency
  - Incentives to meet policy goals (outside of general service quality measures) is not entirely new – e.g., energy efficiency incentives
  - Example: New York's Earnings Adjustment Mechanisms (EAMs)
  - Cited in RAP's Next Gen PBR report
- Motivation: Regulators are asking utilities to take action that may be contrary to their (short-term) financial best interests
- Change in structure: Emerging PIMs tend to asymmetrical upward (i.e., rewards only) – which was also the case for many EE incentives

Practical Implications

Effective PBR frameworks are combinations of regulatory mechanisms that address specific goals and are, also, aligned and consistent

- E.g., The RIIO framework combines revenue caps, PIMs and incentives into a single integrated framework
- Some specific goals are more effectively met through traditional incentive mechanisms, more so than through widely cited PBR
  - MRPs and PIMs generally do not provide incentives to expedite investments in reliability and/or resilience; cost containment may be at odds with expedited investment
  - Risk reduction may be more effectively accomplished via trackers/riders and/or formula rates

Moving Along UoF Path

The changing industry landscape also points to a need to revisit the scope of PBR incentives

- Upside scenarios indicate strong economic future for utilities via electrification applications and value added services, in contrast to death spiral cases
- Transitioning into a platform-based future will likely require a bridging mechanism
- And a shift from stick to carrot – asymmetrical upward incentives

PBR In Michigan

- Meeting all PA 341 considerations would require applying a portfolio of PBR elements; i.e., a multi-component plan
- Likely course of action requires prioritization of regulatory goals, e.g.:
  - Rate case reduction / smoothing out rate adjustments / regulatory stability
  - Investment in grid and system reliability
  - Also, should consider Emerging PIMs

Michigan Legislation	Related PBR Mechanisms
Multi-year periods; increase the length of time between rate cases	MRPs (price caps, revenue cap) Stair step adjustments, I – X
Encourage utilities to make investments that have extended payback periods	Trackers/Riders, Formula rates
Totex	Totex or variations thereon
Targeted performance areas (e.g., customer satisfaction, reliability)	PIMs
Profit sharing	ESMs, regulatory assets

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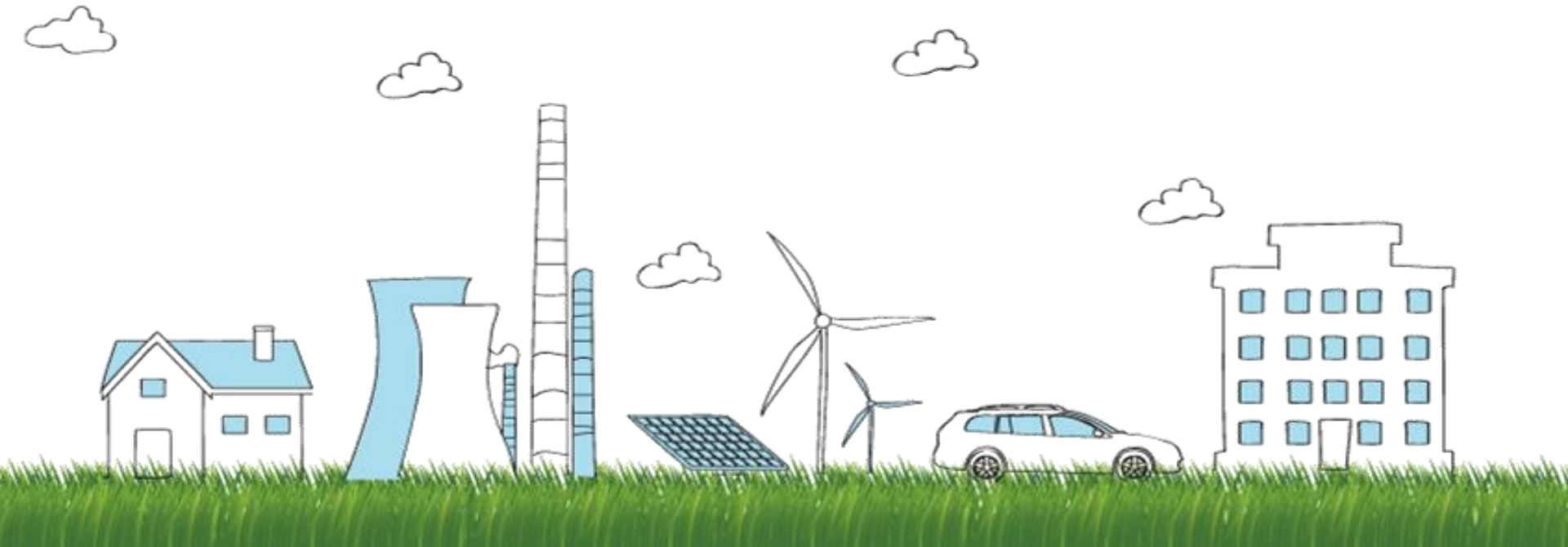
UTILITY PBR & REGULATORY FRAMEWORK SUMMARY



BEYOND MARKET SHIFTS, FIVE WAVES OF TECHNOLOGY ARE RESHAPING THE ENERGY SYSTEM

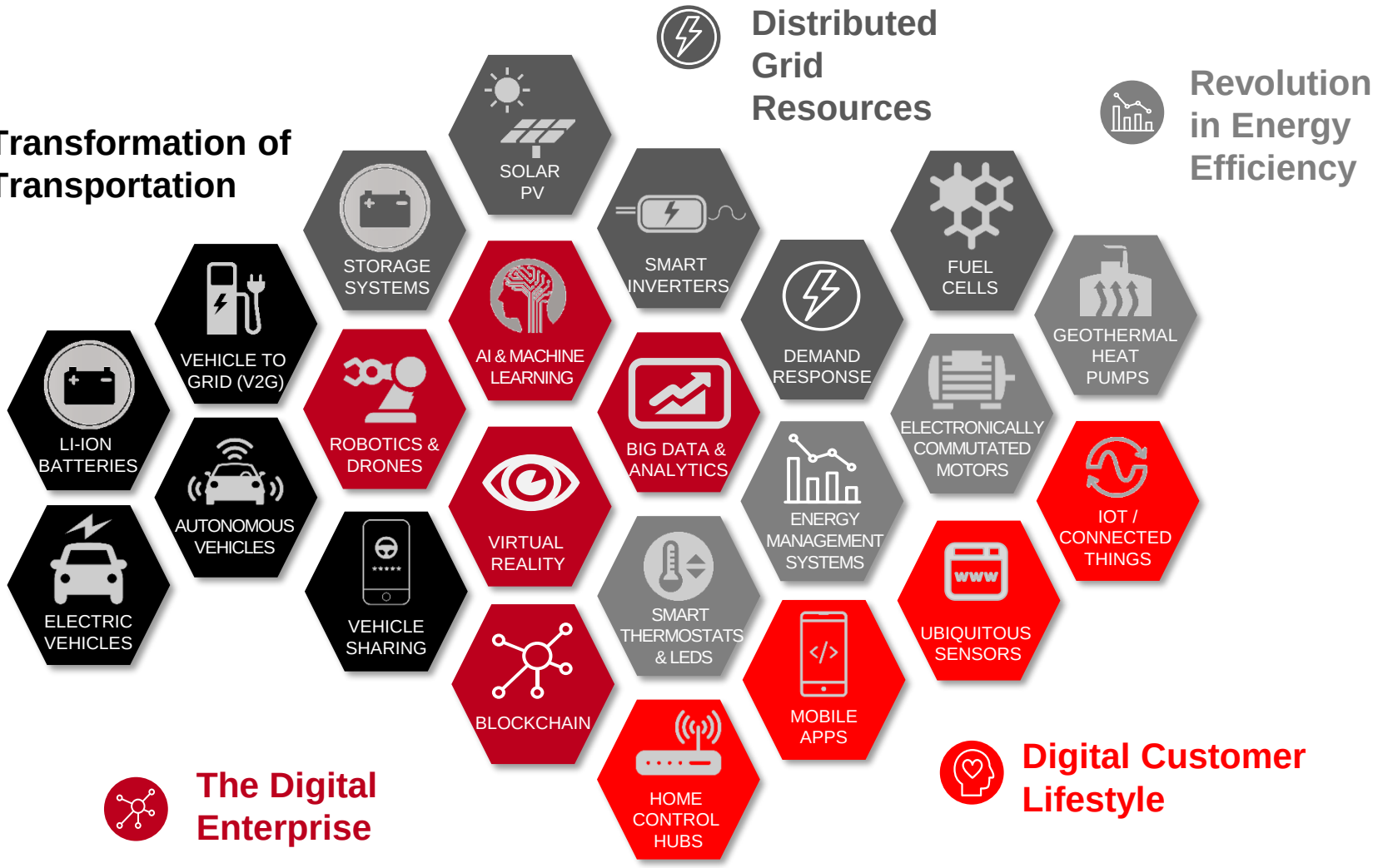
The adoption of disruptive technologies …

- **Transformation of transportation**
- **Distributed grid resources**
- **Revolution in energy Efficiency**
- **Digital customer lifestyle**
- **The digital enterprise**

… is accelerating the need to reshape the industry business model

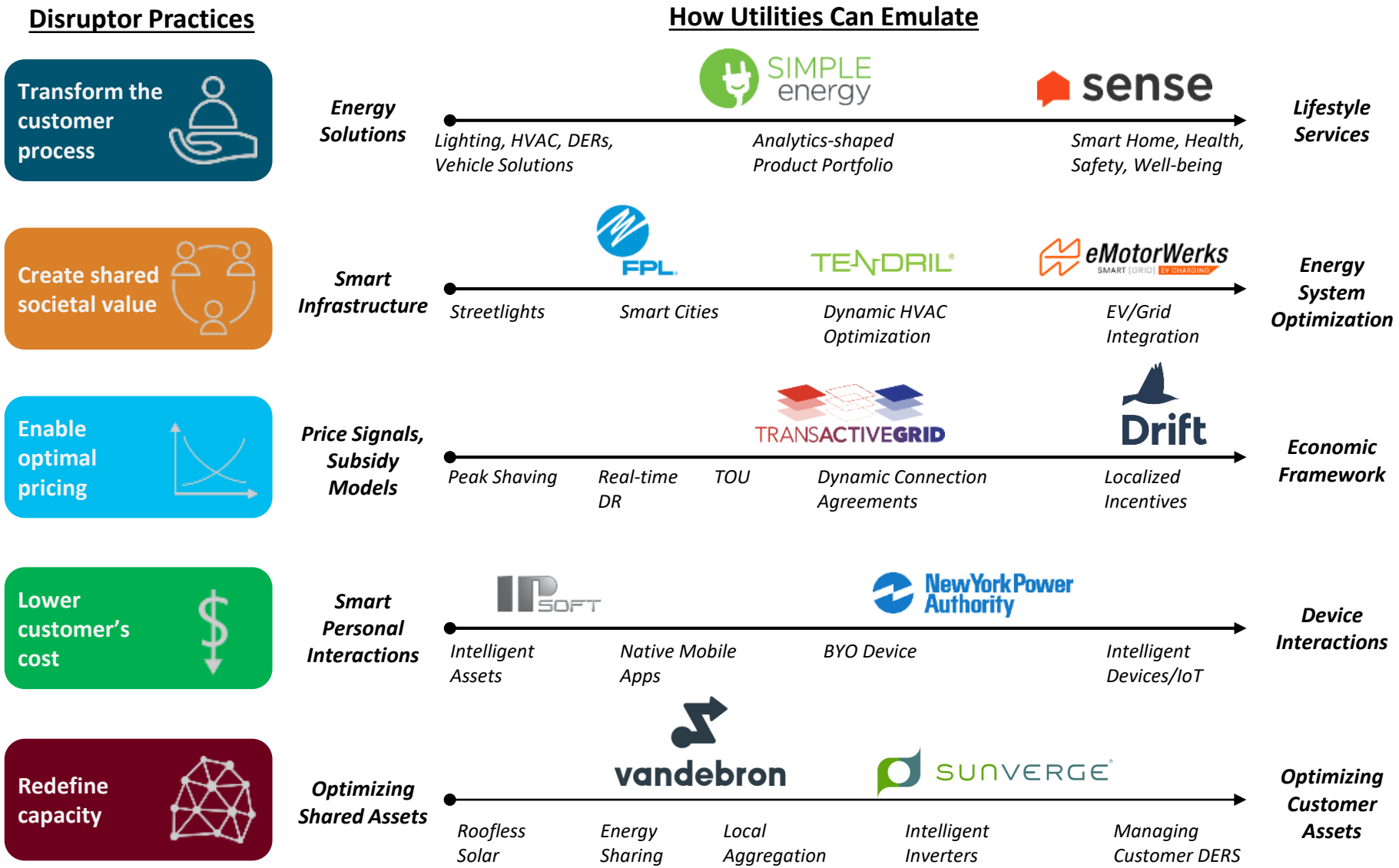
- **70 percent decrease in battery costs** over two years
- **40-fold increase in EV charging stations** over the past eight years
- Onshore **wind costs will fall 41 percent** by 2040
- **31 percent CAGR** in number of connected home devices shipped
- 58 percent of customers expecting utilities to give them **tailored advice to reduce bills**
- $20 billion on cumulative **smart grid analytics spending** between 2012-2020

EACH OF THESE WAVES ARE DRIVEN BY VARIOUS COMBINATIONS OF EMERGING TECHNOLOGIES



Source: "Capital Theft: Stealing the Utility Business Model", Accenture, 2017

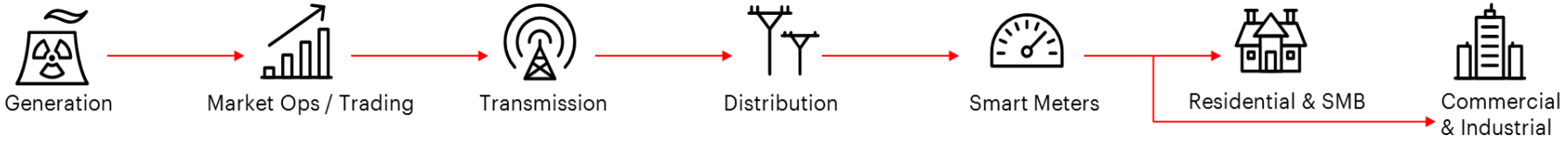
CROSS-INDUSTRY PRACTICES ILLUSTRATE THE PATH TO GREATER INNOVATION FOR UTILITIES



Source: "The Digital Utility: Operating at the Heart of the New Energy System", Accenture, 2016

WEF ESTIMATES THAT DIGITAL TECHNOLOGIES CAN CREATE $1.3 TRILLION IN VALUE GLOBALLY

Electricity Value Chain



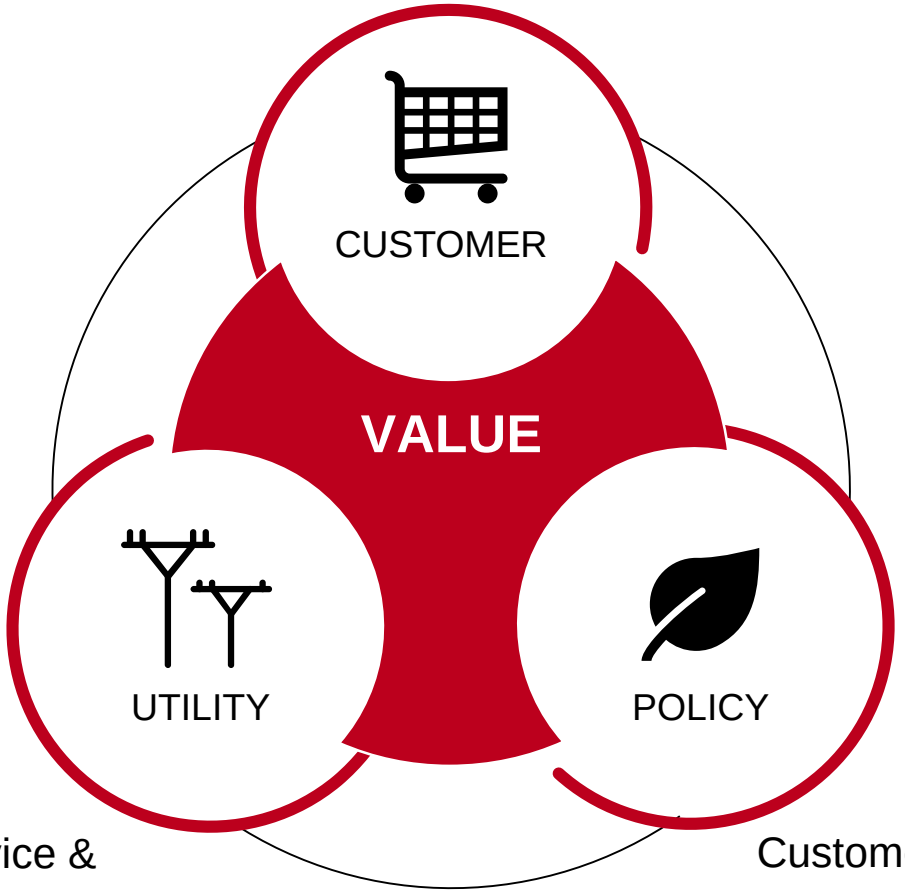
Themes for unlocking value:

	Grid Optimization & Aggregation	Asset Lifecycle Management	Integrated Customer Services
	Real-time, remote-control or predictive maintenance that extends efficiency and life of generation and T&D assets.	Real-time load balancing, network controls and integrated markets, enabled by connected assets, machines, devices and advanced monitoring capabilities.	Innovative digitally enabled offerings relating to energy generation and energy management.
10 Year Value (USD):	$470 B	$420 B	$410 B

Source: Digital Transformation of Industries: Electricity", World Economic Forum (WEF), Accenture 2016

REGULATORY OUTCOMES IMPACT THREE MAIN STAKEHOLDER GROUPS WITH DIFFERING PRIORITIES

CUSTOMER
Better Total Economics & Choices

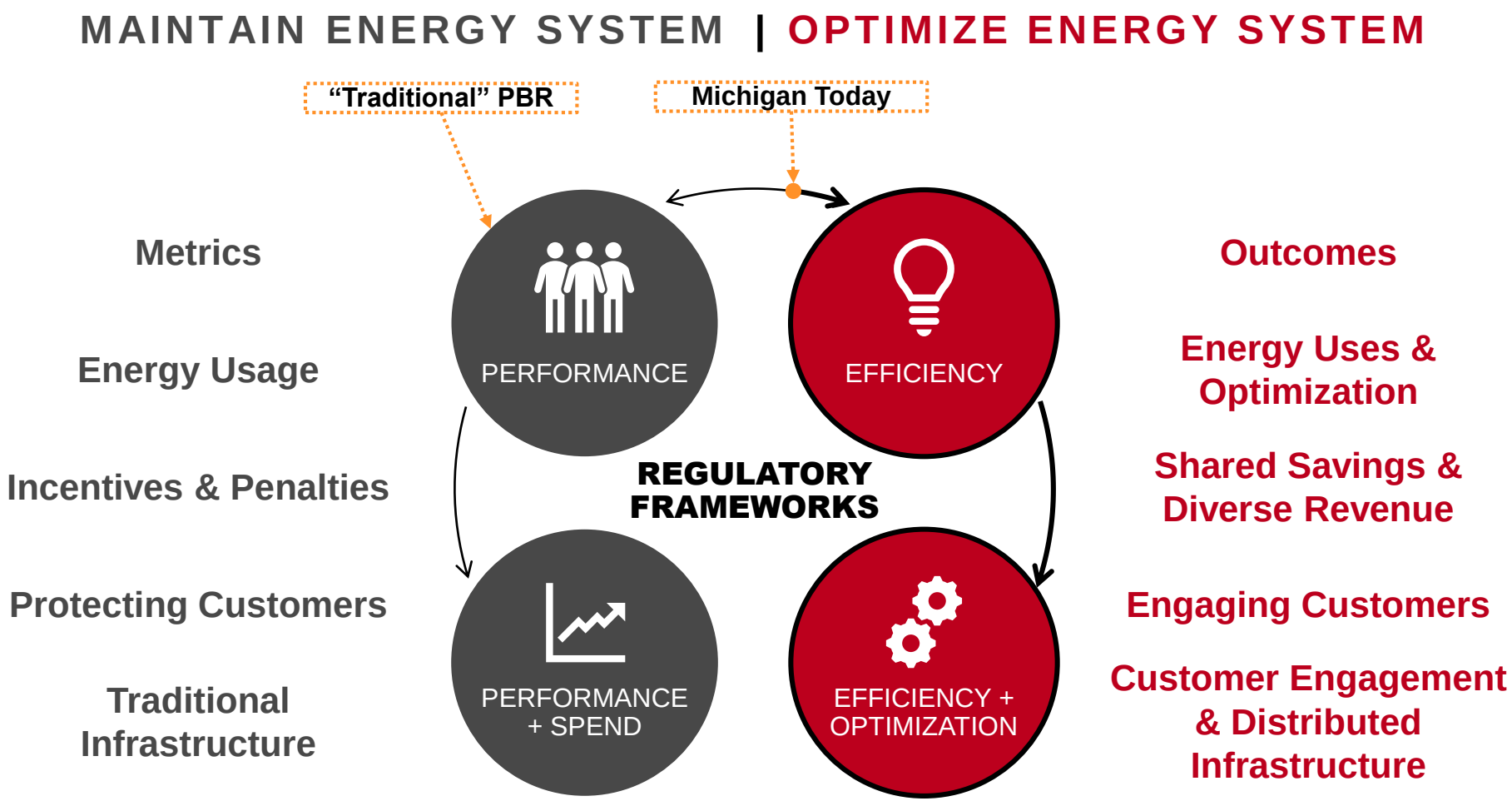


UTILITY
Reliable, Efficient Service & Shareholder Value

POLICY
Customer Protection, Energy Security & Energy System Optimization

REGULATION CAN FOCUS ON OUTCOMES THAT UNLOCK VALUE FOR ALL STAKEHOLDERS

Shifting the focus can dramatically improve stakeholder alignment and provide incentives for the right actions



FOUR REGULATORY FRAMEWORKS REPRESENT OPTIONS FOR REGULATORY MODERNIZATION

MAINTAIN ENERGY SYSTEM → OPTIMIZE ENERGY SYSTEM

NARROW

HOLISTIC

PERFORMANCE

Allowed returns + traditional PBR metric incentives

- **Quality Metrics**
  - Reliability & Resiliency
  - Customer Issue Resolution
  - New Service Installation
- **Asymmetrical Benefits**, bias towards penalties limiting upside

EFFICIENCY

Energy savings gainshare + asset return with EE decoupling

- **Energy Efficiency Metrics** (e.g. Customer Behavior, EE Adoption, etc.)
  - Energy Efficiency Gainshare
  - Generation Performance Incentive factor
  - Line Loss Reduction Incentive
- **Provides gainshare incentives** for energy savings beyond traditional returns, which provides relief for load decline due to energy efficiency

PERFORMANCE + SPEND

Cost saving mechanism + outcome performance targets

- **Spend Efficiency & Quality Metrics**
  - Spend Efficiency Gainshare
  - Reliability & Resiliency
  - Customer Issue Resolution
  - New Service Installation
- **Benefits to customers limited to utility spend savings** (not system efficiencies)

EFFICIENCY + OPTIMIZATION

Energy savings gainshare + asset return + EE decoupling + non-wire alternatives + market-based revenues

- **System Optimization Metrics**
  - Energy Efficiency Gainshare
  - Generation/T&D Gainshare
  - Locational Incentives & Pricing Optimization
- **Builds on Efficiency** expands efficiency beyond customer savings to entire value chain, and allows non-traditional revenue streams

CUSTOMERS WILL BE IMPACTED DIFFERENTLY DEPENDENT ON THE REGULATORY PATH

MAINTAIN ENERGY SYSTEM | OPTIMIZE ENERGY SYSTEM

PERFORMANCE

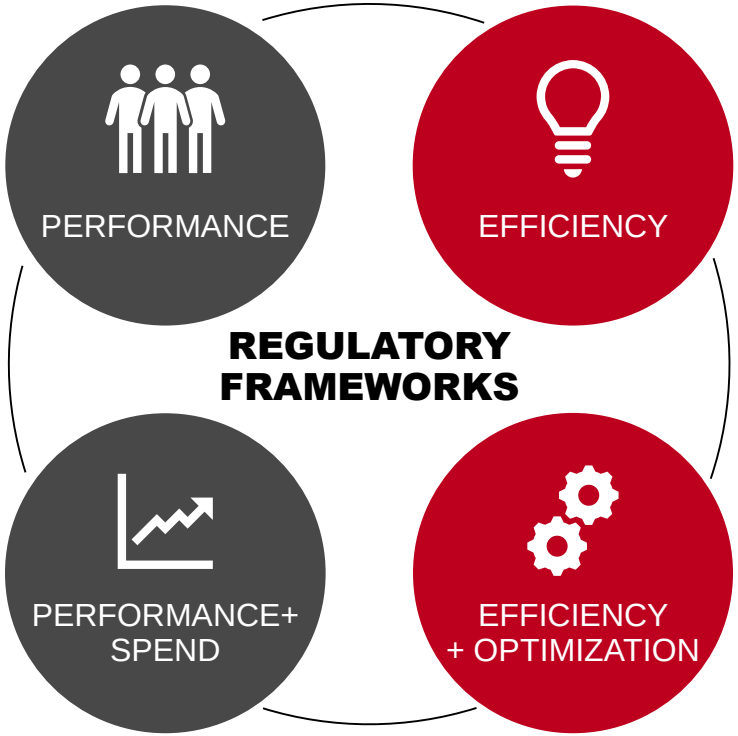
+4% / year

Annual residential bill increases if a traditional performance-based incentive regulatory framework was enacted.

PERFORMANCE + SPEND

+5% / year

Annual residential bill increases if a RIIO-like regulatory framework is enacted and utilities underperform.



EFFICIENCY

$105M / year

Annual fuel and capacity savings projections, shared with customers

EFFICIENCY + OPTIMIZATION

$140M+ / year

additional cost savings that can be shared with customers every year when engaging in grid optimizing programs

IMPERATIVES FOR UTILITIES TODAY

CAPITAL – unpack and reframe the capital investment plan

COST STRUCTURE – aggressively drive cost and performance

CUSTOMER – transform the customer strategy & engagement model

REGULATORY – change game in policy and regulatory agenda

INNOVATION – use corporate venturing and partnerships