Distribution Service Providers – an Update

catherine.mitchell@exeter.ac.uk

IGov New Thinking For Energy

University of Exeter

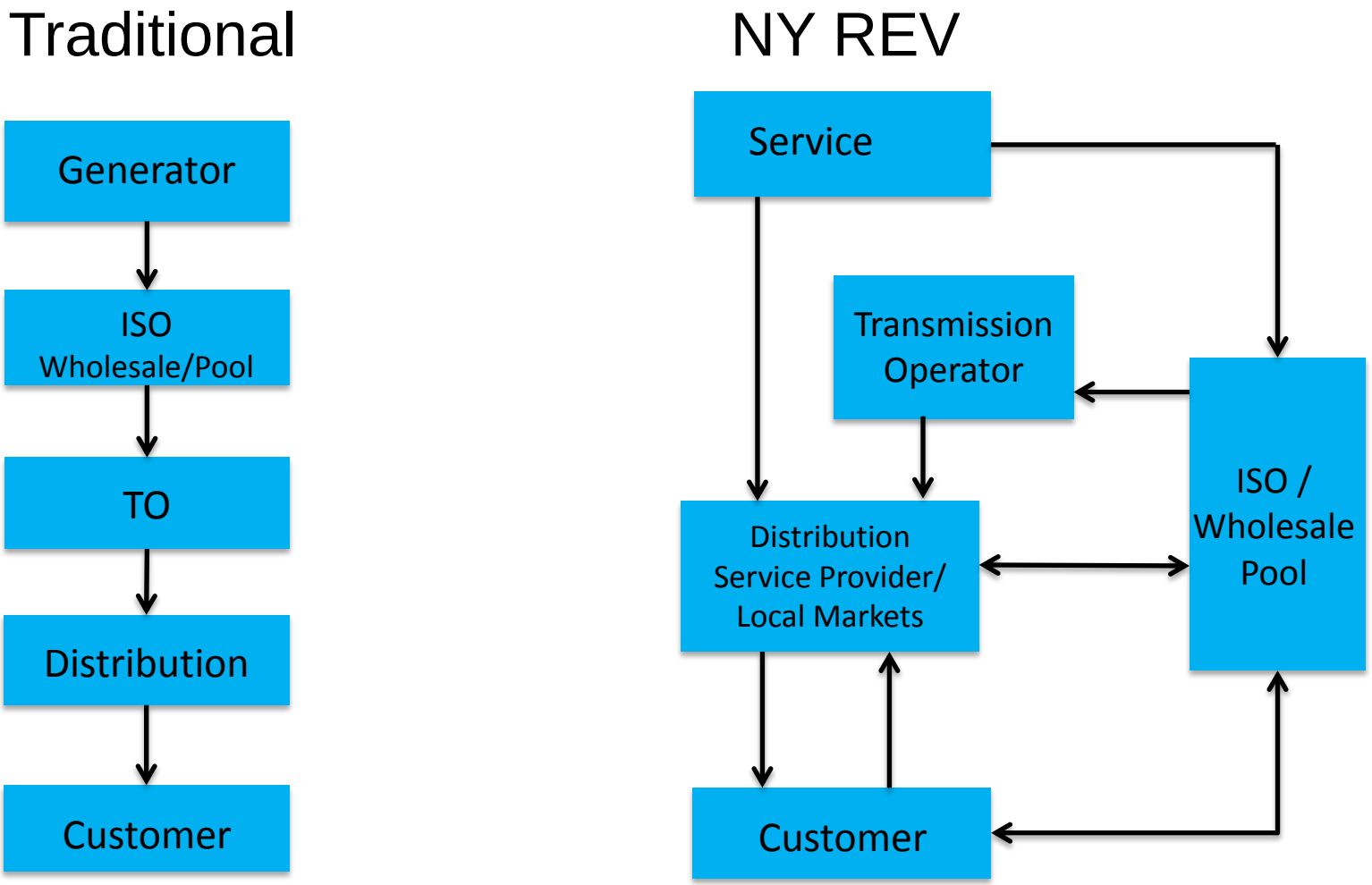
EPSRC Engineering and Physical Sciences Research Council

Overview

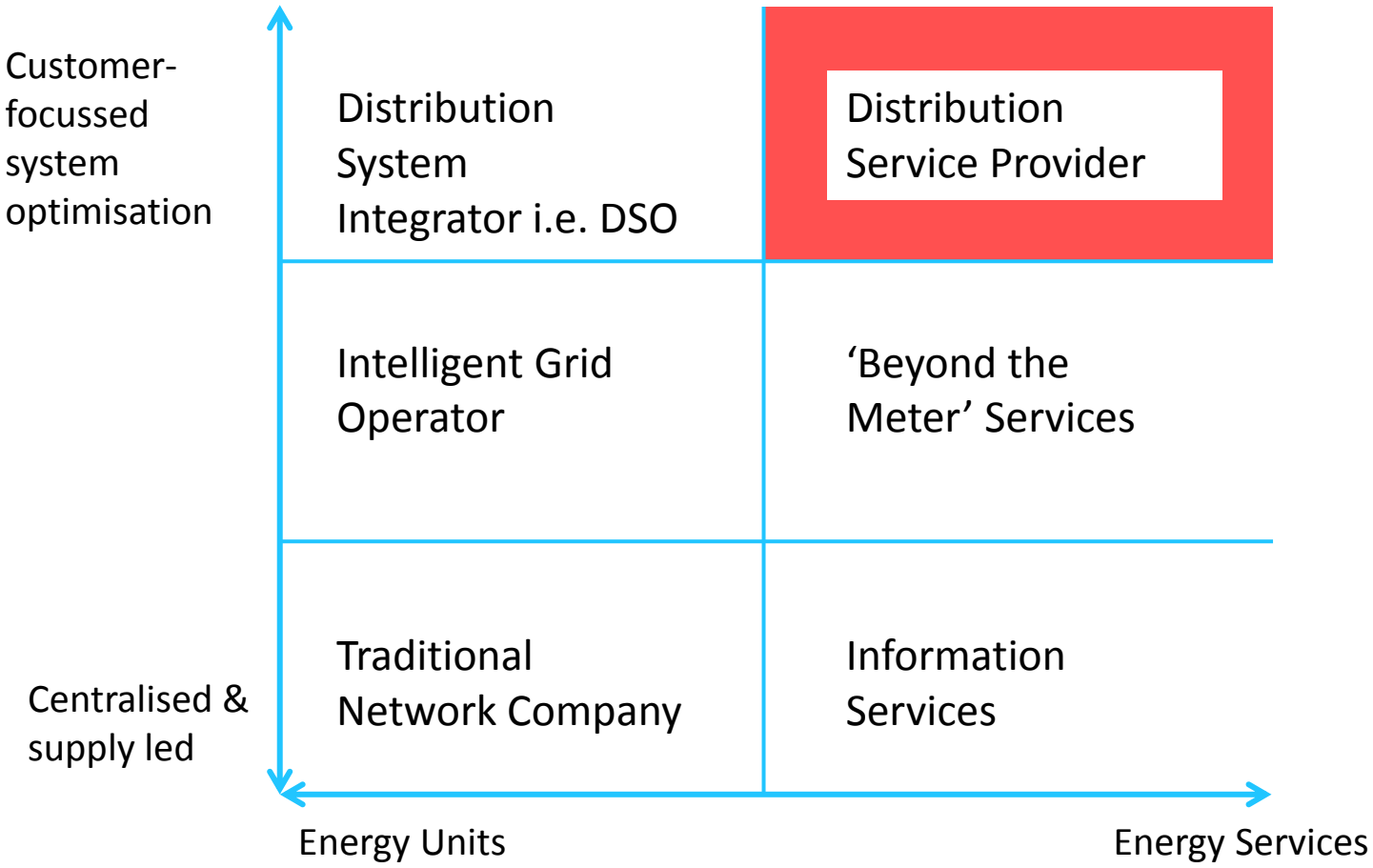
- IGov wrote a blog about distribution service providers (DSPs), and this power point is an update to that with a few slides which are intended to help explain what a DSP does. [we also ran an event on DSPs in May 2016 – DSP Roundtable]
- Slide 2 uses the NY Reforming the Energy Vision to show that DSPs are a new value proposition and become the 'heart' of the electricity system .
- Slide 3 explains how a DSP is the opposite of a traditional network company in relation to system optimisation and energy services.
- Slide 4 shows what the role of a traditional network utility, and the key incentives of its rate of return or capital based regulation
- Slide 5 shows the role of a DSP, and how it is primarily regulated through performance based regulation, linked to desired outcomes.
- Slide 6 shows that as a market facilitator, DSPs can undertake coordinated management control to better increase system efficiency. The DSPs are the market facilitators or managers of platforms - they are not the do-ers. So they can facilitate aggregators, but can also add co-ordination to aggregation.
- Slide 7 shows the fundamental pitch of the NY REV that utilities may make more if they meet certain outputs through their output based regulation revenue but that this should lead to reduce system costs overall and bring down , or at least hold stead, customer bills.
- Slide 8 shows the challenges and opportunities faced by energy system stakeholders – whether it be Government, regulators, small or large companies and so on.
- Slides 9 shows to what extent current regulation in NY state meets those challenges or captures those opportunities.
- Slides 10 shows how the NY REV restructuring is meant to meet those challenges or captures those opportunities.
- Slide 11 explains how DSPs may make money out of certain Earning Adjustment Mechanisms (EAMs)
- Slide 12 sets out various issues which are being assessed – known as scorecards – which may become EAMs in the future
- Slide 13 sets out the rate design principles of the NY REV
- Slide 14 conceptually shows the sources of DSP revenue going into the future
- Slide 15 conceptually shows the potential configuration of DSP markets and vertical market coupling
- Slide 16 shows where DSPs fit into the IGov framework

Some of these slides are developed from: CSIRO and Energy Networks Association 2015, Electricity Network Transformation Roadmap: Interim Program Report; from Rich Sedano, Power Sector Transformation – the case of the NY REV, RAP https://www.raponline.org/search/site/?q=NY%20REV; or from Verschae R., Kawashima H., Kato T., Matsuyama T., Coordinated energy management for inter-community imbalance minimization, Renewable Energy, Volume 87, Part 2, March 2016, Pages 922-935, ISSN 0960-1481, http://dx.doi.org/10.1016/j.renene.2015.07.039

NY State as an Example of Transformative Governance? Too early to say?

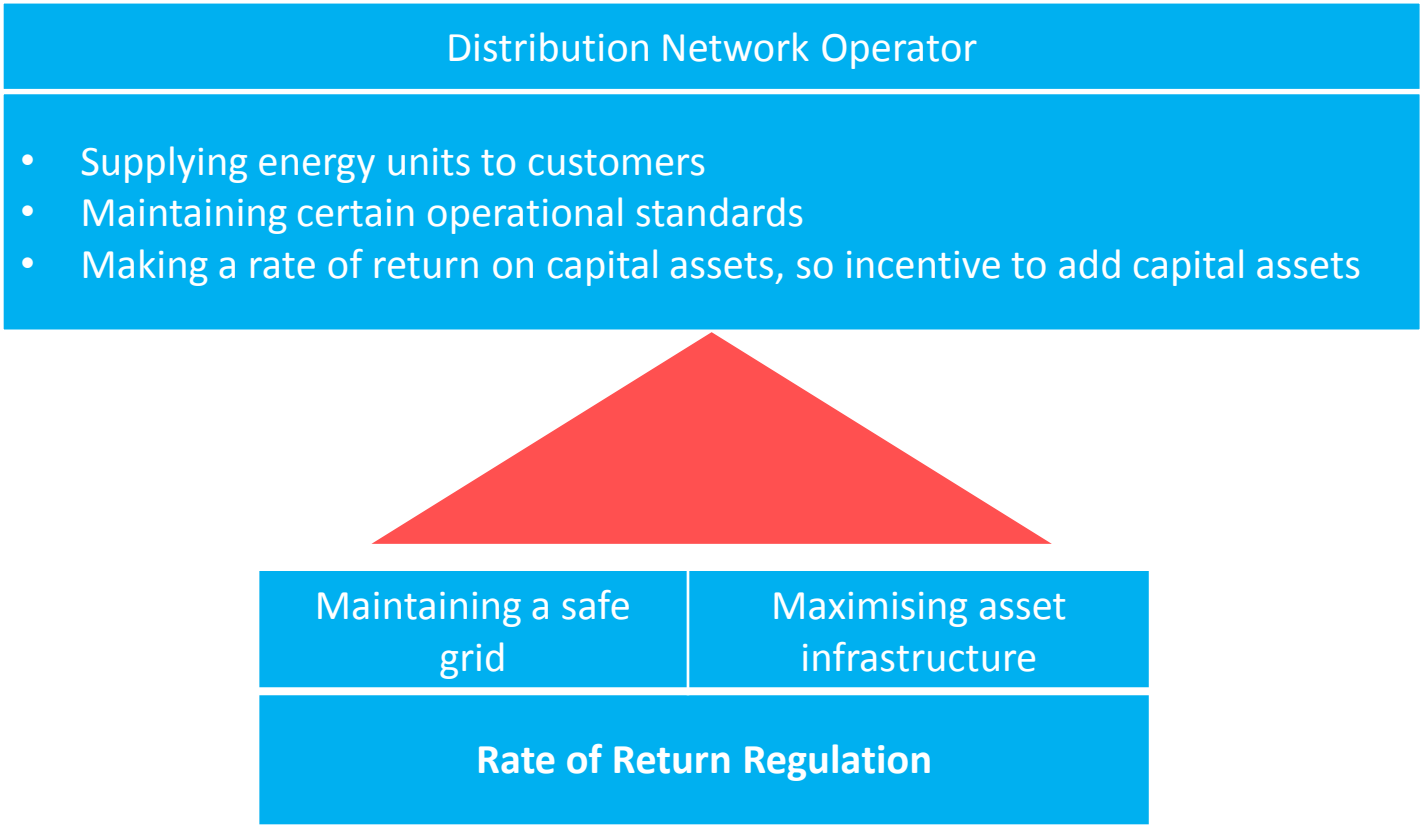


Example: distribution service providers (market facilitators at the distribution level)



Source: Adapted from CSIRO and Energy Networks Association 2015, Electricity Network Transformation Roadmap: Interim Program Report

What is a traditional network utility?

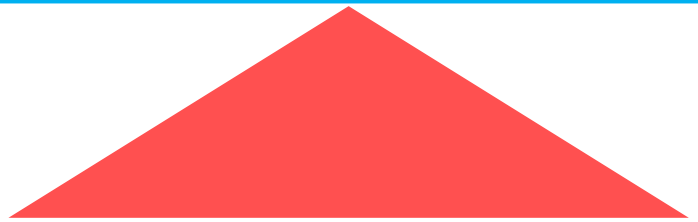


Source: Adapted from CSIRO and Energy Networks Association 2015, Electricity Network Transformation Roadmap: Interim Program Report

What is a Distribution Service Provider?

Distribution Service Provider

- Integrating all types of DER via increased system and energy efficiency
- Enabling customers to provide and be paid for services to D-grid
- Facilitating services between 3rd party providers and customers
- Reveal value
- Becoming 'active'



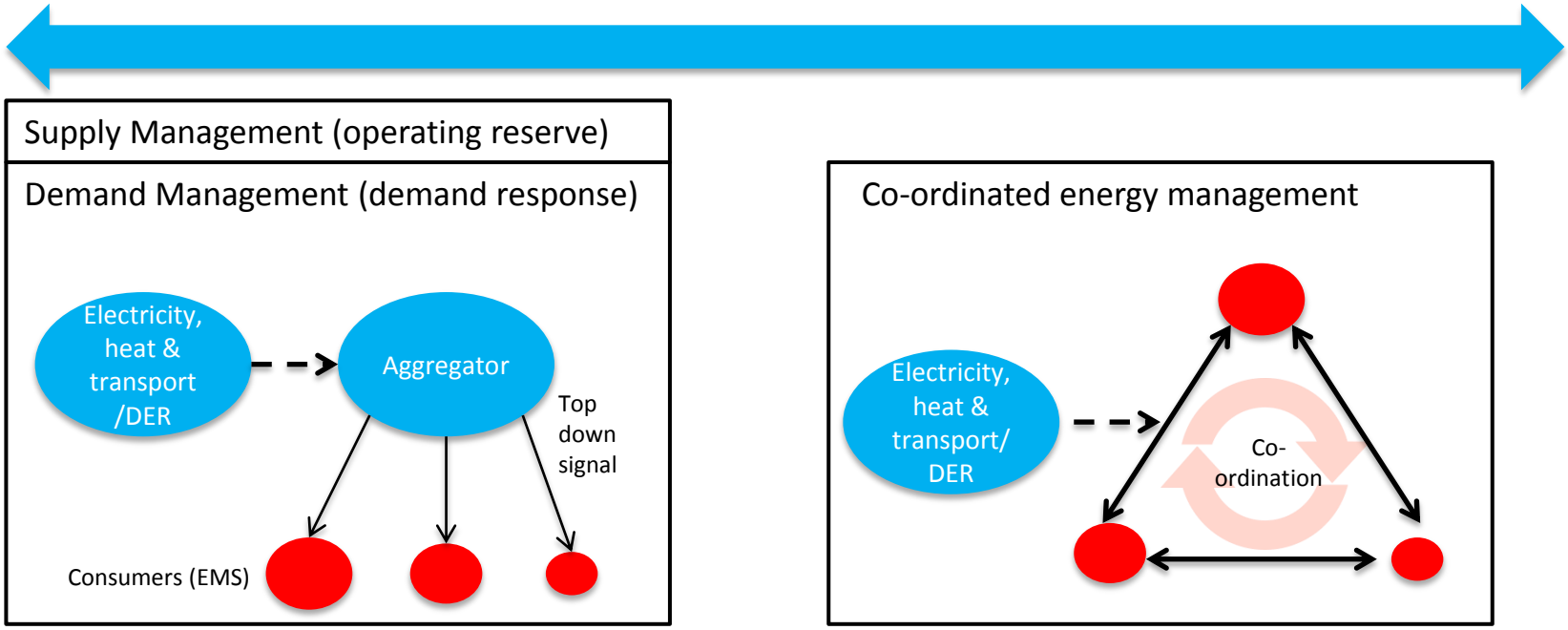
Maintaining a safe & resilient grid	Increasing system efficiency	Optimising infrastructure	Support/ enable public policies	Enabling highly reliable & resilient energy services	Bring forward cost-effective ways of achieving outcomes	Provide transparent data

Higher proportion of Performance Based Regulation to Revenue

Source: Adapted from CSIRO and Energy Networks Association 2015, Electricity Network Transformation Roadmap: Interim Program Report

Energy Management Paradigms

Supply-side **Demand-side**



Demand Management from supply-side

- Actors do not communicate
  - No control feedback
- Cluster of single actor best effort
- Limited control ability

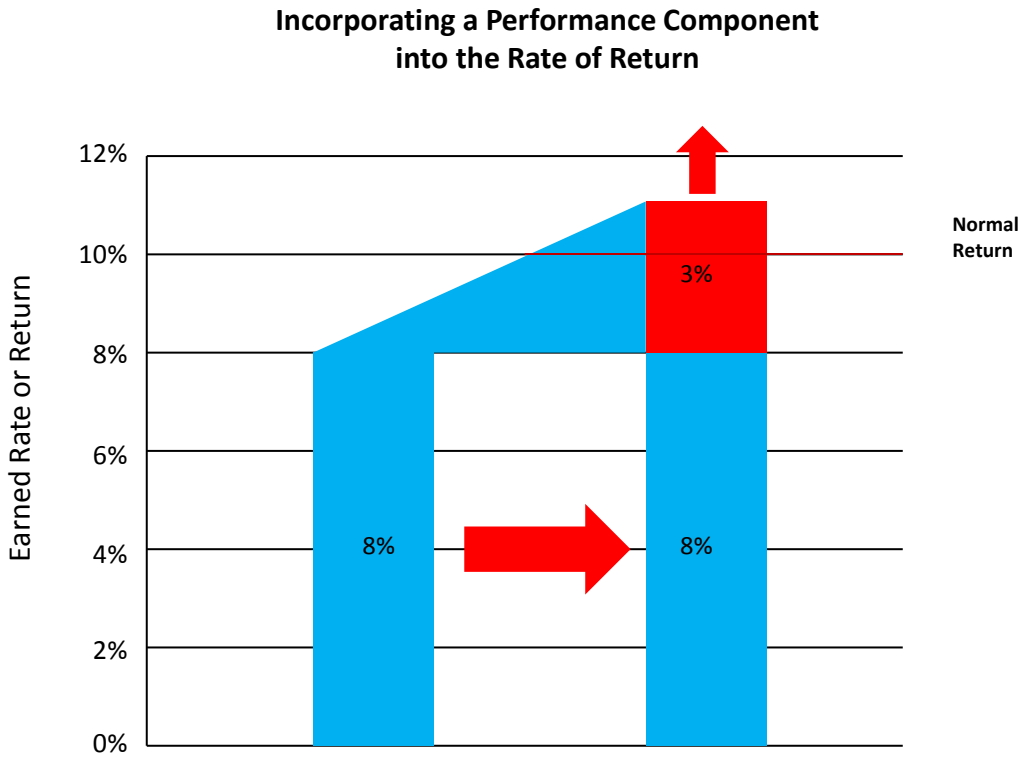
Demand Management from demand-side

- Actors communicate to coordinate
  - control feedback
- Community best effort
- Higher control ability

Source: adapted from Vercschae, Kato, Kawashima & Matsuyam (2015) http://vision.kuee.kyoto-u.ac.jp/japanese/happyou/pdf/Rodrigo_ASN_2015.pdf

The idea: the DSP could make a higher return if it met PBR goals but overall energy system cost to customers would be lower with increased services

- A zero-based approach
  - Before performance is considered, utility earns X % based on rate base
    - You can also start at normal return and go up and down
- Normally allowed return consistent with compliance-based performance
- Higher return available for increasing, exemplary level of measured performance via PBR



Source: Richard Sedano: Power Sector Transformation: The Case of New York REV, 2015

Current Challenges to be met in energy system	Opportunities of Change to be Captured
• To transfer from the current energy system to a decarbonised on ○ requires 'new' energy system which implies new roles (institutions, utilities, customers, providers, intermediaries , business models, etc), new governance and regulatory environment, new value propositions; speeding up	• New technologies (supply, demand, ICT) enable a more efficient energy system through greater coordination: utilise infrastructure assets more fully; reduce total infrastructure needs; and reduce costs
• Infrastructure (including ICT) has to be upgraded, and paid for	• Ability to meet customer wishes and develop new business models to do so
• Need to keep prices as low as possible for customers	• New institutional ops to keep prices as low as possible for customers
• Have to keep up with change: decentralisation, rapidly changing technology costs, system economics and operation enabled by ICT, customer and civil society preferences, varying incumbent v new entrant wishes	•Ability to be more resilient to change – whether weather, technologies, customer preferences, policy requirements – and to be more flexible and nimble
•Altering where value currently is in system to where we need it to be to enable innovation	
•Attracting appropriate investment	

Past NY State Governance

Past Regulation	Incentivises	Suited to challenges / opportunities? NO
Rate of Return on Capital Assets	Passive Management and Operation	Customer prices will have to go up to pay for upgrades because of inefficient system operation
Small % related to PBR	Adding capital assets	Not sufficiently resilient to change
Payment per unit transferred across network	Supply orientated system operation	Lags technological change and social preferences
		Does not meet policy goals of sustainable, resilient and affordable ES

NY Reforming the Energy Vision

Governance	Incentivises and therefore meets challenges	Captures opportunities? YES
Various revenue streams	More active Management and Operation, including asset utilisation	Efficient infrastructure development
	Improved resilience, reliability and efficiency of system operation, including the demand side	Customer focus central to Vision, so customer preferences enabled
	Meeting policy goals	Attracts new entrants and new ideas
	Increased customer choice of services and leverage of customer involvement	Allows markets and operation to evolve as value for new services is revealed
	Keeps system costs down, including infrastructure spend	It is a way to access demand reduction and flexibility
	Keeps customer prices down	New ICT key enabler
	Keeps up with technological change and social preference	Allows new business models for new services

Earnings Adjusted Mechanisms (p53)

Staff Prioritised Outcomes	Staff Implementation issues
Peak reduction: oriented toward near-term system savings and development of DER resources;	Existing rate incentive measures should be retained but should be reviewed for their continued usefulness;
Energy efficiency: oriented toward integrating efficiency with demand reduction and increasing the total amount of efficiency activity;	New EAMs should be positive-only in direction, with the exception of customer engagement and interconnection, which should be symmetrical;
Customer Engagement: oriented toward near-term activities to educate and engage customers and provide access to data;	Positive-only EAMs in the longer term should be tied to a bill impact metric;
Affordability: oriented toward promotion of low-income customer participation in DER, and toward reduction in terminations and arrearages; and	EAMs may be oriented toward outcomes that utilities can influence and need not be confined to activities over which utilities have direct control;
Interconnection: oriented toward increasing the speed and affordability of interconnection of distributed generation.	Most EAMs should be on a multi-year basis rather than annual, to allow time to develop desired outcomes;
	EAMs should be compensated or charged via accounts that are reconciled in rate cases;
	All utilities should have EAMs for the same categories, while details may vary among utilities; and
NB EAMs are intended to be near-term requirements to enable distribution level markets to function; and a bridge until a more market-orientated time	Total size of revenues at stake need to be determined on a case by case basis.

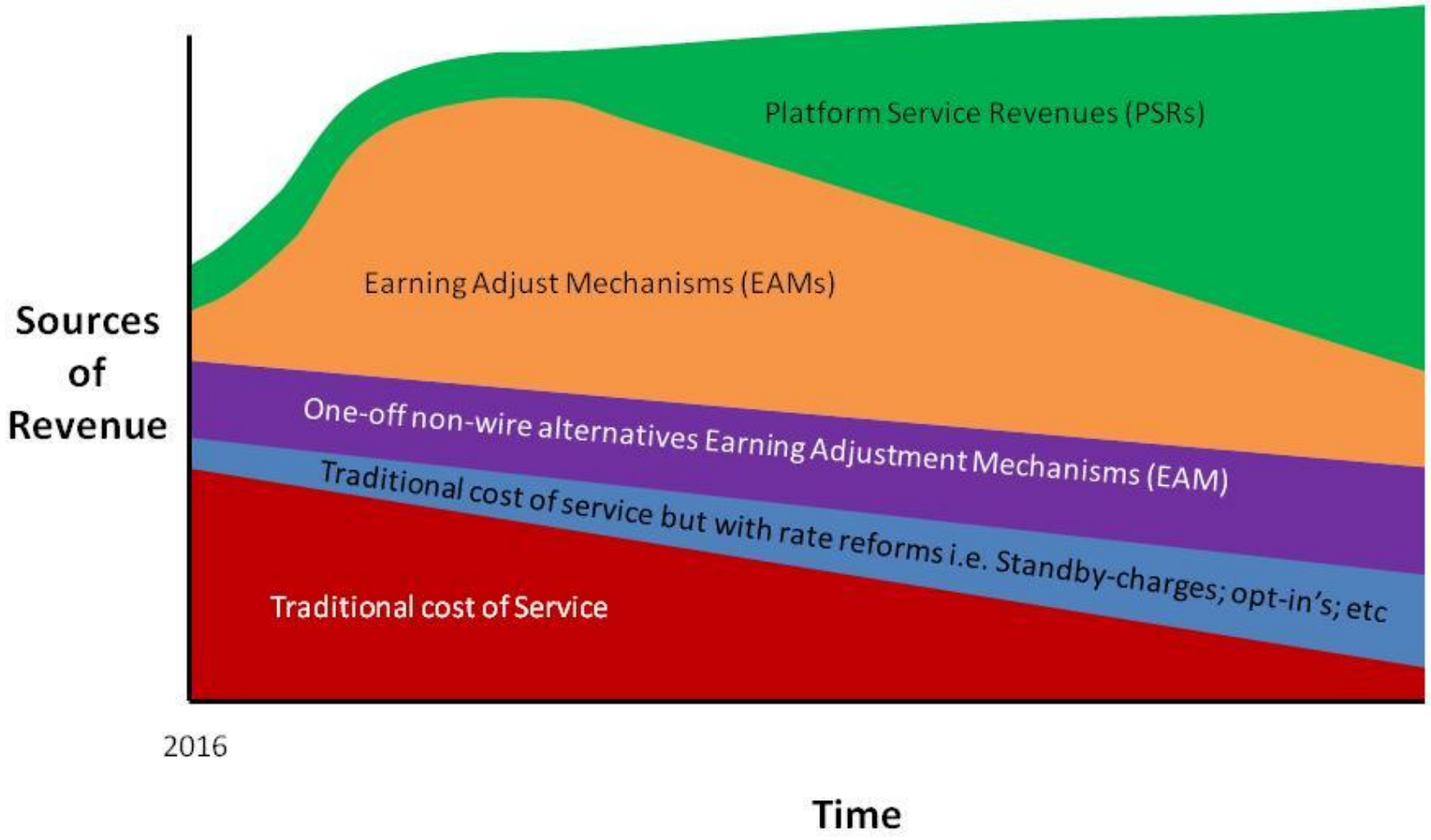
Scorecards May Become EAMs p93-96

Staff recommended metrics	Commissioner comments
System utilization and efficiency: this would encompass load factor, T&D system utilization, fuel diversity, and overall system heat rate;	More collaborative work needed
DER penetration: this would focus on the penetration of distributed generation, dynamic load management, and energy efficiency as a percentage of total utility load;	Think about affordability
Time-of-use rate efficacy: this would measure the rate of adoption of opt-in TOU rates, and the ability of customers to reduce their bills via these rates;	Maybe carbon an EAM but work through CES
Market-based revenues: this would track the amount, and sources, of utility revenues from platform and value-added services, to reflect the degree of market uptake and the success of utilities in adjusting their business models;	Add resilience as a metric
Carbon reduction: this would track the market penetration of carbon-free sources as a percentage of total load within each utility's service territory;	These metrics likely to become EAMs in future once data available
Conversion of fossil-fueled end uses: this would track the adoption rates of electric vehicles and conversion of combustion appliances to high-efficiency electric appliances;	
Customer satisfaction: this would utilize existing indices that measure customer satisfaction, complaint response time, escalated complaint response time, and pending cases; and	
Customer enhancement: this would be a broader index encompassing the affordability metric, customer engagement in markets, customer satisfaction, and HEFPA compliance rates.	

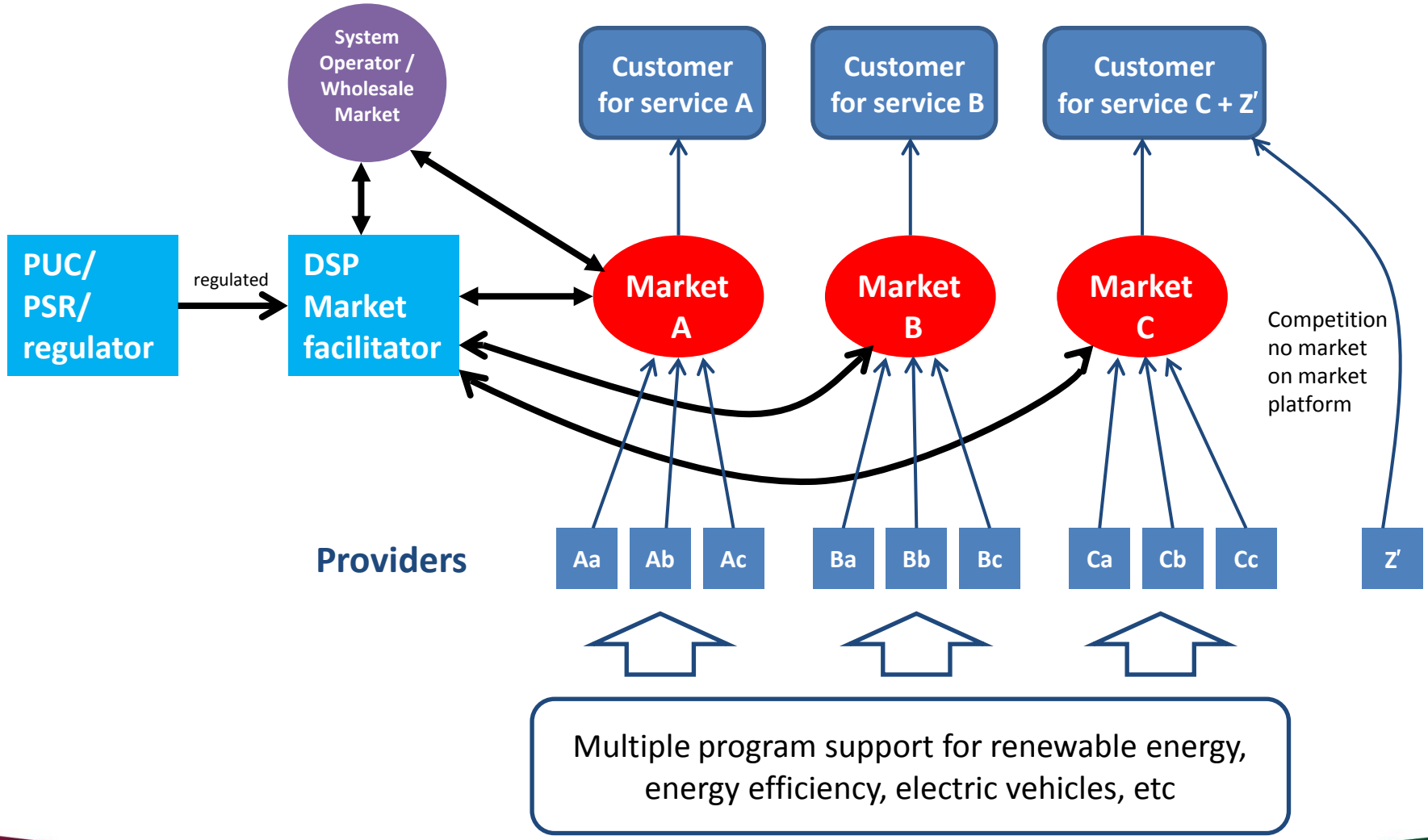
Rate Design Reform

Types of customers	Customer granularity to be developed	Rate design principles to guide reforms
Traditional consumers	Temporal	Cost causation
Active consumers	Locational	Encourage outcomes
Prosumers	Attribute	Policy transparency
		Decision-making
		Fair value
		Customer-orientation
		Stability
		Access
		Gradualism
NB Consumers who rent their homes, reside in multi-family or mixed-use facilities, and/or do not have individual metering may lack either an economic incentive or practical access to manage their energy usage by investing in DER		

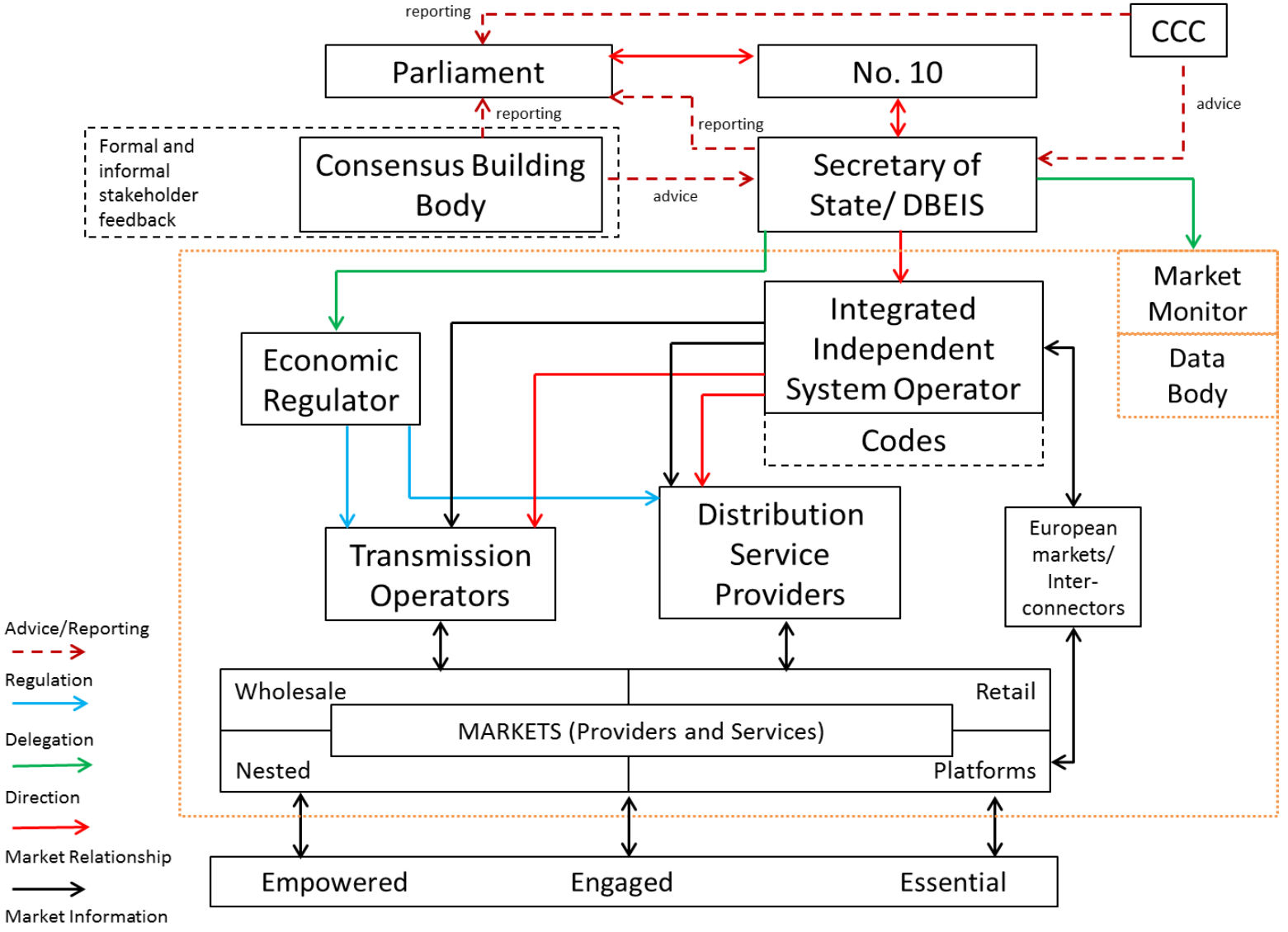
Sources of Utility Revenue within NY REV



DSP Markets


System Operator / Wholesale Market
Customer for service A
Customer for service B
Customer for service C + Z′
PUC/ PSR/ regulator
regulated
DSP Market facilitator
Market A
Market B
Market C
Competition no market on market platform
Providers
Aa
Ab
Ac
Ba
Bb
Bc
Ca
Cb
Cc
Z′
Multiple program support for renewable energy, energy efficiency, electric vehicles, etc

Where the DSPs fit into the IGov Framework



Thanks

The IGov research:

http://projects.exeter.ac.uk/igov/

Power Sector Transformation – the case of the NY REV, Rich Sedano, RAP

https://www.raponline.org/search/site/?q=NY%20REV

Is a return on performance the icing?

An addition to ROE of a few % or basis points or cents per share?

Is return on performance a significant % of total earnings?

Is this sufficient to induce action motivate utilities to improve performance?