

Distribution Service Providers (DSP)

a transformative energy system institution?

26th May 2016, London.

**Introduction to DSO vs DSP... potential
regulations and incentives**

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New Thinking For Energy



Overview

- Challenges facing energy system
- Opportunities facing energy system
- IGov ideas about transformative governance
- IGov Governance Framework
- Introduction to DSO / DSP
- Quick Review of NY REV and 19 May 2016 Order

Current Challenges to be met in energy system	Opportunities of Change to be Captured
<ul style="list-style-type: none"> • To transfer from the current energy system to a decarbonised one <ul style="list-style-type: none"> ◦ 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 	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • Infrastructure (including ICT) has to be upgraded, and paid for 	<ul style="list-style-type: none"> • Ability to meet customer wishes and develop new business models to do so
<ul style="list-style-type: none"> • Need to keep prices as low as possible for customers 	<ul style="list-style-type: none"> • New institutional ops to keep prices as low as possible for customers
<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Ability to be more resilient to change – whether weather, technologies, customer preferences, policy requirements – and to be more flexible and nimble
<ul style="list-style-type: none"> • Altering where value currently is in system to where we need it to be to enable innovation 	
<ul style="list-style-type: none"> • Attracting appropriate investment 	

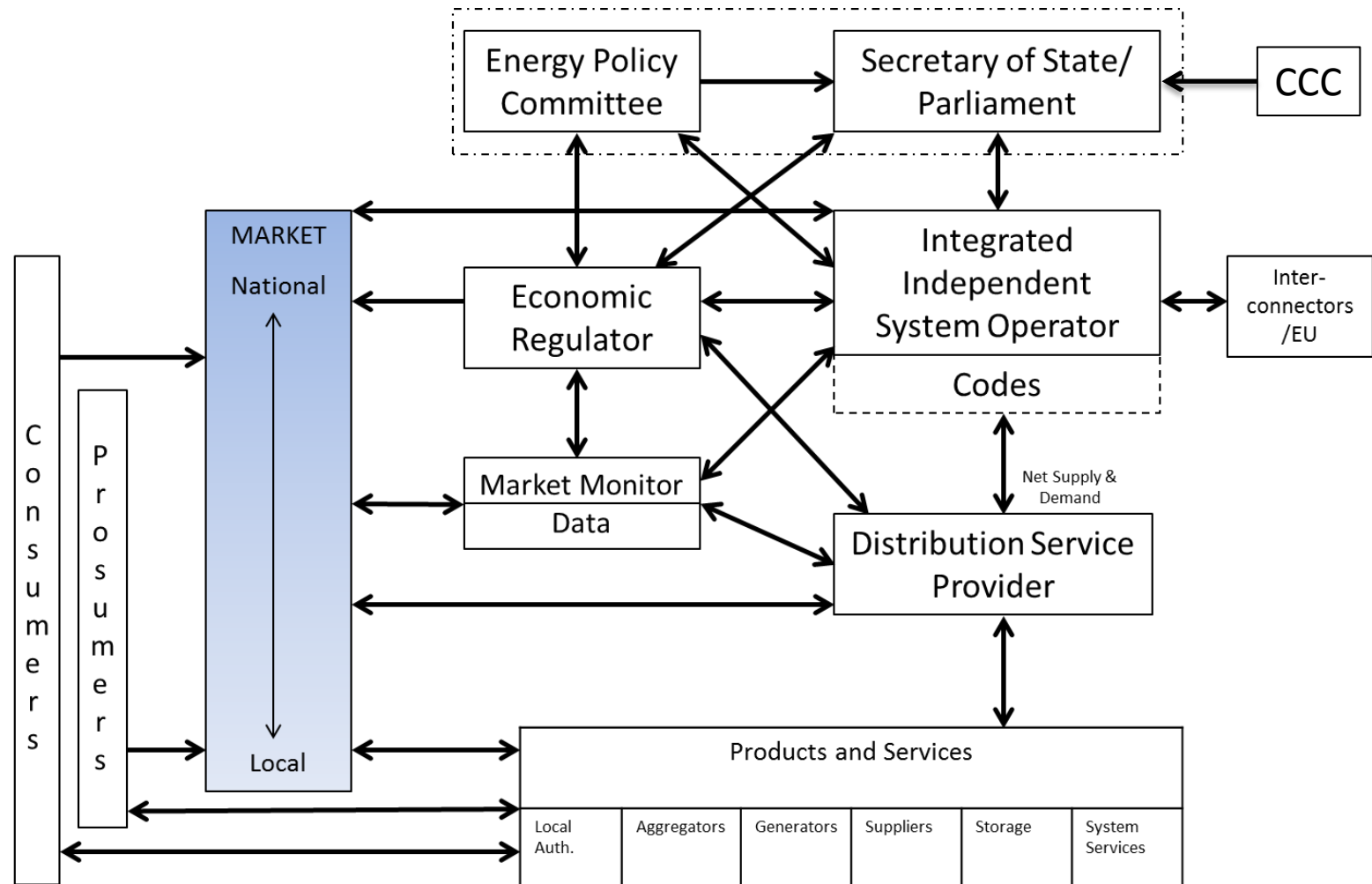
IGov beginning to have some idea of transformative governance

- There has (arguably) been very few transformative energy policies / governance since 1970's:
 - RE and CHP policies in Denmark in response to oil crises in 1970s
 - PURPA Act in CA in 1970's again in response to oil crises
 - FITs in Germany in 1990/1;
 - Nuclear phase out in Germany?
 - NEM and / or DSR in some US States?
- Leading to structural, dynamic change which better meets policy goals and society's preferences

And what characterises those transformative measures....

- The decision-makers understood the energy system challenges they were dealing with at the time, then
 - Knowingly dealt with the current challenges
 - Enabled more choice for customers (all types) / new entrants, and thereby gave them more influence
 - Overcoming inertia
 - Kept up with technological and social change and preferences
 - Assessed cost/benefits in ways beyond straight CBA
 - **Enabled the means to capture the new opportunities ie provided value or removed barriers**

The IGov Governance Framework – which we argues deals with challenges; enables opportunities to be captured; and fits with transformative characteristics



Multiple new ideas about DSOs / DSPs etc - NY, SE Australia, Illinois, CA

Chicago's REV: How ComEd is reinventing itself as a smart energy platform

ComEd wants to be the platform for a dynamic and distributed grid, CEO Anne Pramaggiore told Utility Dive. But how they'll earn revenue on it remains an open question.

By [Gavin Bade](#) | March 31, 2016 [print](#)

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STATE OF NEW YORK
PUBLIC SERVICE COMMISSION
CASE 14-M-0101 - Proceeding on Motion of the Commission in
Regard to Reforming the Energy Vision.

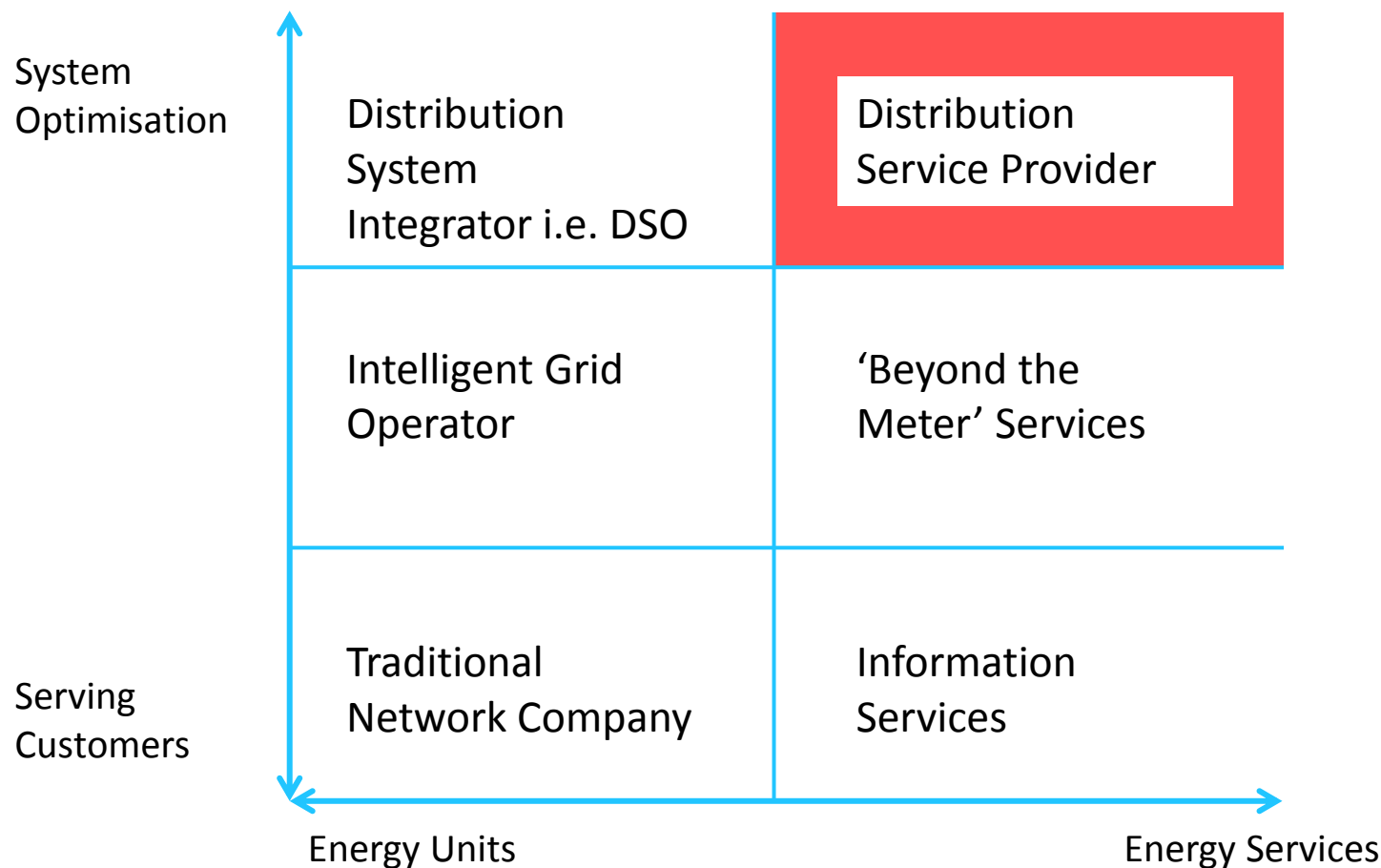
ORDER ADOPTING A RATEMAKING AND UTILITY
REVENUE MODEL POLICY FRAMEWORK

Issued and Effective: May 19, 2016

How California wants to align utility revenue models with DERs

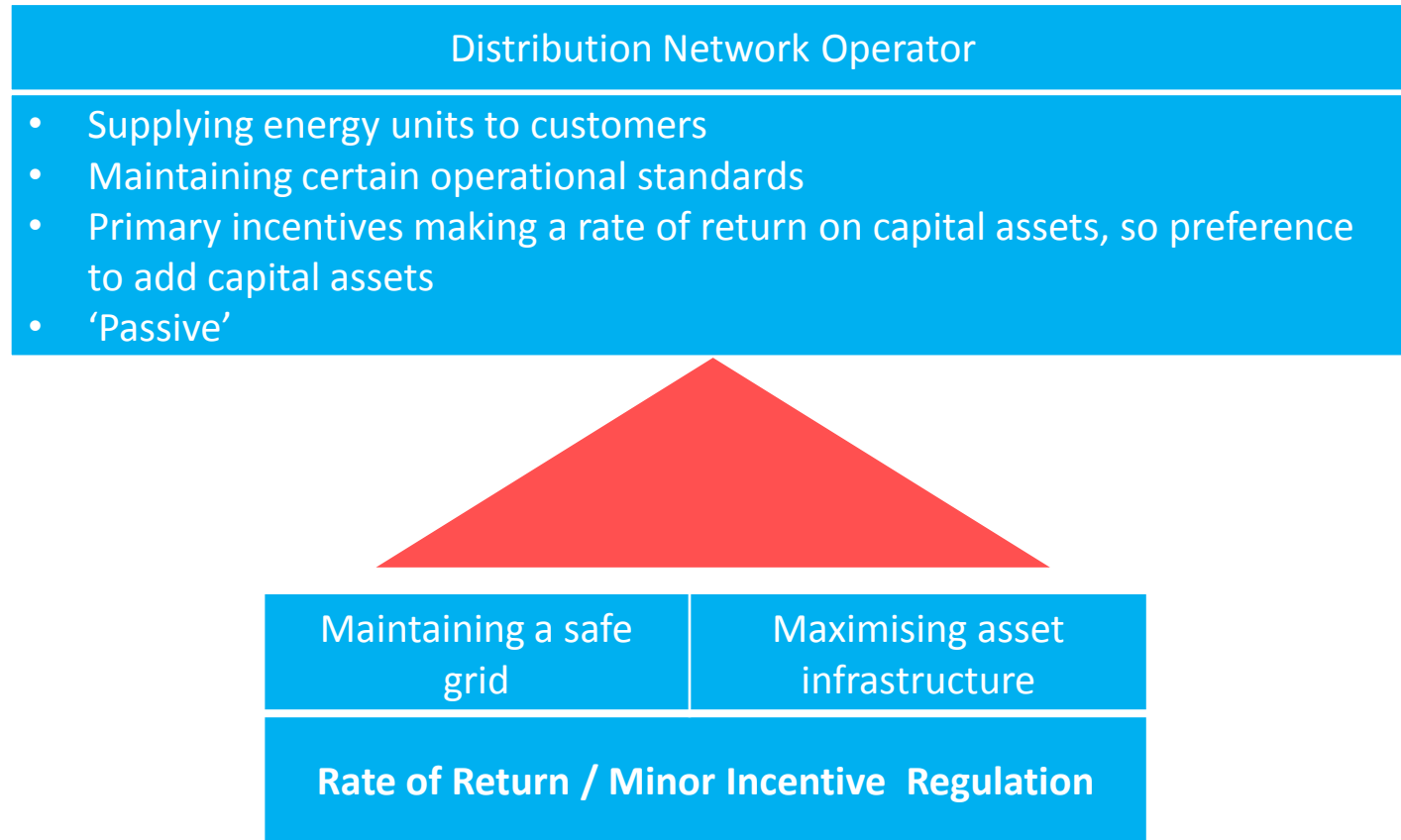
A new CPUC proposal puts forth an innovative framework for utilities to earn a rate of return on DER procurements

What does a DSP do? And how is it different from a DSO?



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
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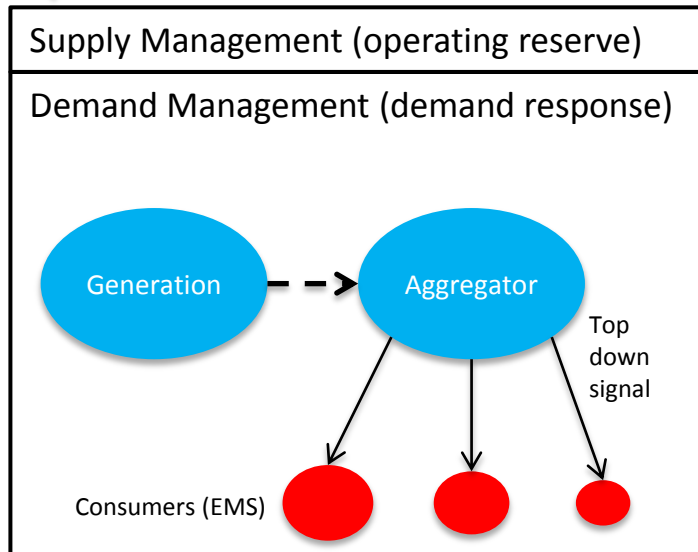
Higher proportion of Performance Based Regulation to Revenue

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

What does a DSP allow? Bottom-up optimisation and co-ordination – establishing D relationship with Transmission

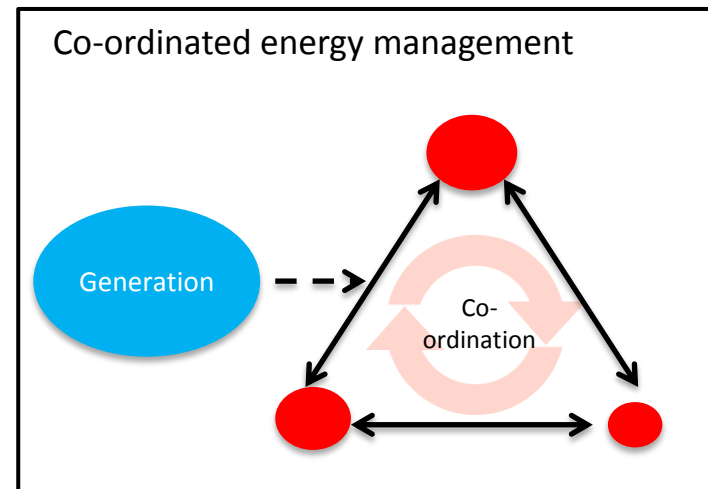
Supply-side

Demand-side



Demand Management from supply-side

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



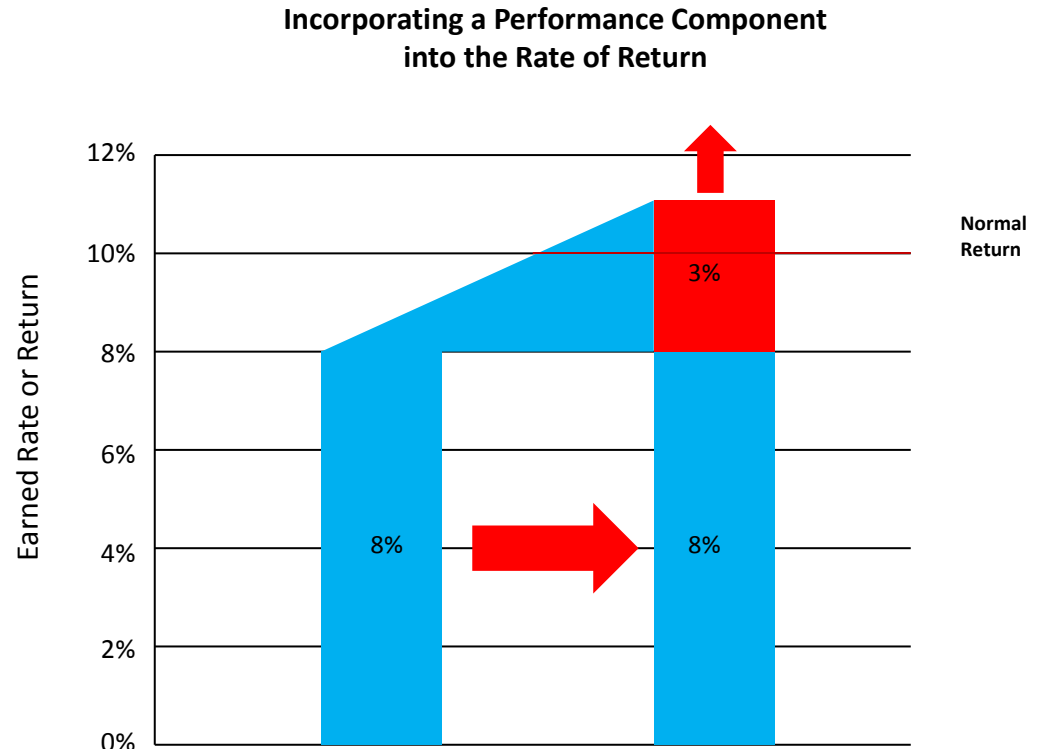
Demand Management from demand-side

- 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

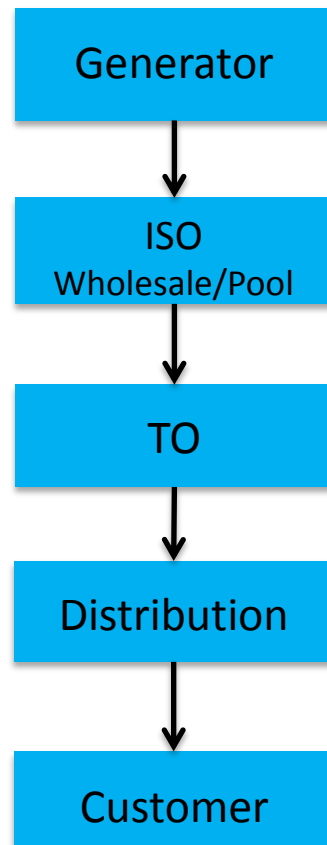
- A zero-based approach
 - Before performance is considered, utility earns X % based on rate base
 - You can also start at normal return and go up and down
- Normally allowed return consistent with compliance-based performance
- Higher return available for increasing, exemplary level of measured performance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



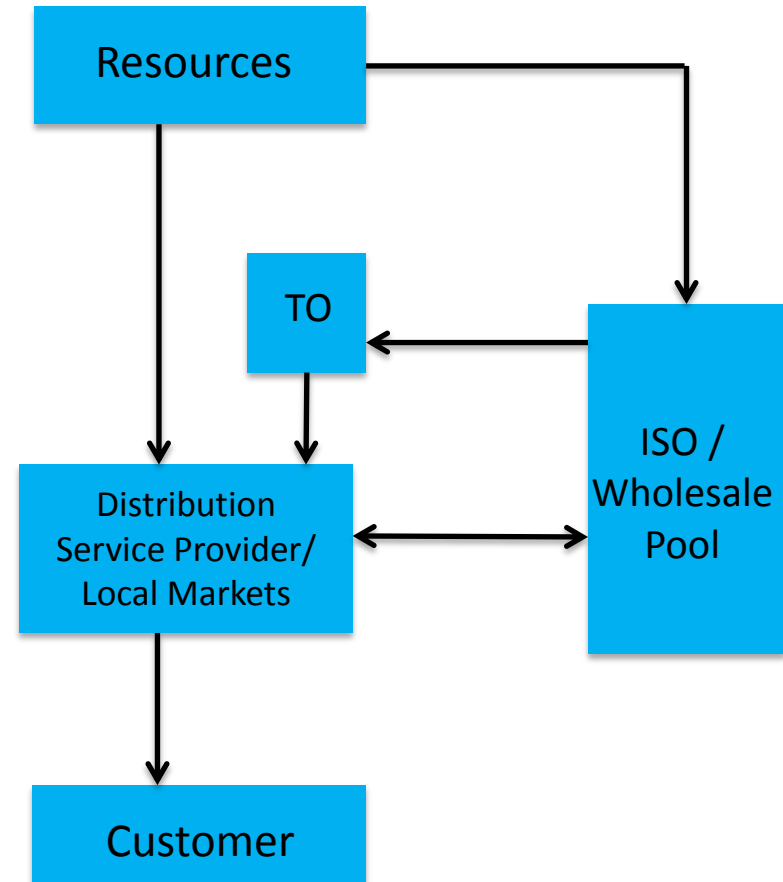
Source: Richard Sedano: [Power Sector Transformation: The Case of New York REV, 2015](#)

CM's concept of NY State NY REV structure – prior to Order publication 19/5/16

Traditional



NY REV



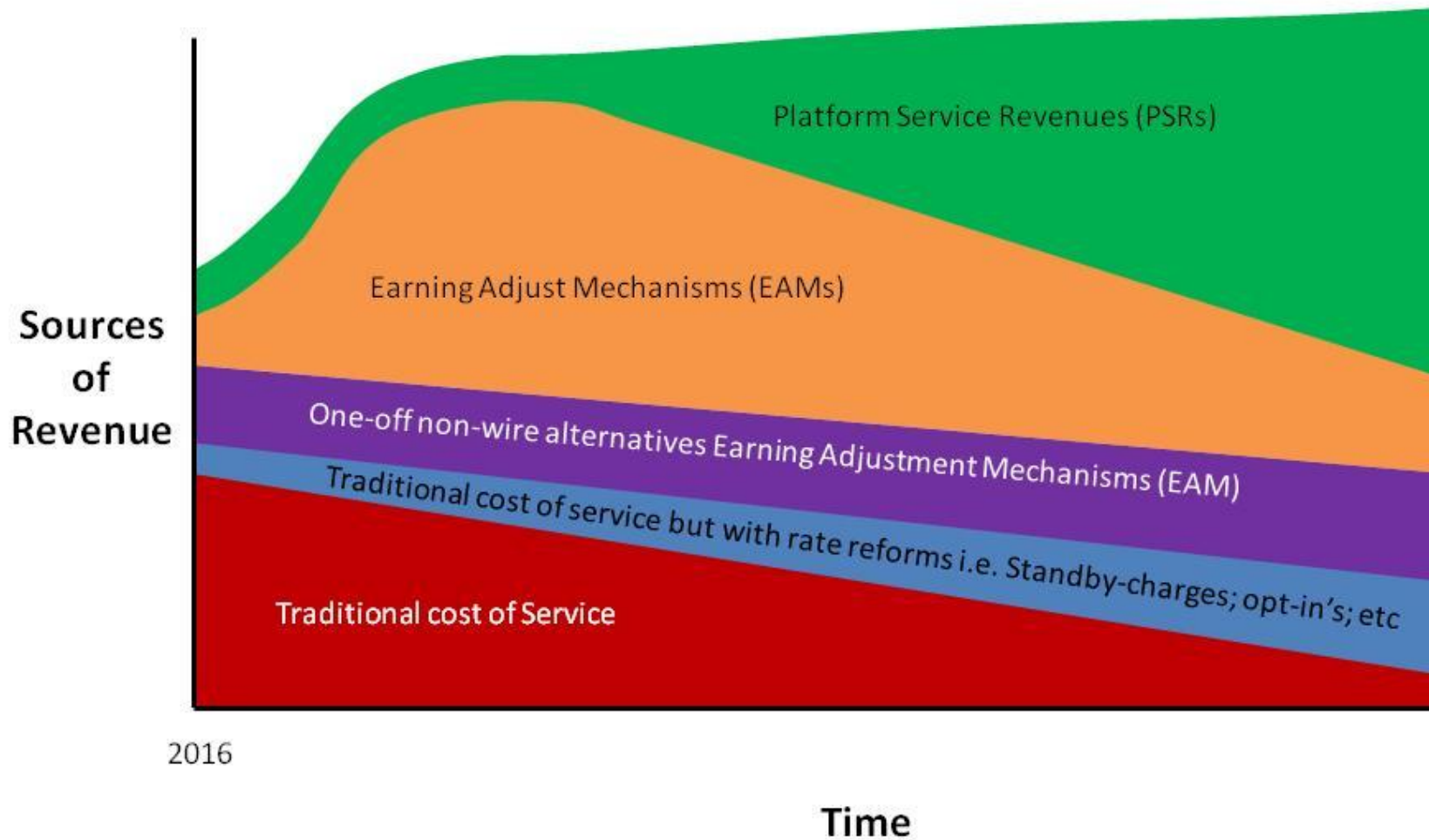
Past NY State Governance

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

Sources of Utility Revenue within NY REV



How actually does this effect utility revenues in NY – so far more about re-positioning utilities than actual revenue change – its ‘steady as she goes’

- Traditional cost-of-service continues for foreseeable future
- Rate reforms to complement new entrants, prosumers, more connected customers and demand focussed system
- New shorter-term EAMs to establish the building blocks of a transactive energy system – but total value in 1st round should not be more than 100 basis points [equivalent to 2.4% of delivery rates or 1.1% of total bills].
- One-off EAMs ie COMEd's BQDM project
- PSR which are expected to kick-in once EAMs get going

What does this mean for regulation versus competition in NY REV?

- Still joint distribution / supply although retail competition
- EAMs regulated in rate cases – currently every 3 years – still only small percentage of delivered revenues
- PSRs – appear to have cumbersome criteria and again are regulated even though idea is to have transactive economy
- Utilities retain control of data and of ‘opt-in’s (ie connecting more customers)
- PSC has retained right to push harder if limited movement on part of utilities
 - In general, PSC took cautious approach given contested areas
- The NY Order is more a repositioning – than a fundamental assault on utility role and revenues

Potential Questions for Roundtable on NY REV

- NY (and other places) very useful evidence-based restructuring for GB to learn from
 - Is ‘slowly as she goes’ the right speed for change in GB?
 - Is the current NY PBR % of revenues sufficient to drive ‘active’ networks?
 - Is a combination of energy and system values important?
 - Does bottom-up system optimisation matter?
 - Is the complementary nature of EAMs and PSRs useful?
 - Is the link between rate-making and DSP useful?

Questions for the Day

- What is the difference of a Distribution System Operator or a Distribution Service Provider?
- Where will the value be for distributed energy resources within the energy framework, and who will capture it?
- What is the appropriate institutional framework for:
 - integrating transmission and distribution networks,
 - national and local markets
 - integrating electricity, gas, heat and transport
- What institutions, policy and regulation are needed?

THANKYOU

[http://projects.exeter.
ac.uk/igov/](http://projects.exeter.ac.uk/igov/)

ANNEXE

Order clear on problems of traditional framework for rate-making, particularly dynamic efficiency (p30) and need for new incentives

- REV contemplates expansion of system resources owned by customers and third parties, often as alternatives to traditional utility investments.
- REV also contemplates utilities relying on DER through procurements that would traditionally be accounted for as operating expenses. Reliance on DER also reduces the direct control that utilities maintain over their systems, which can create the perception of increased risk.
- Under traditional ratemaking, DERs encounter twin barriers: they displace the growth of utility rate base, and they add to operating expenses.
- Irrespective of capex versus opex, more important bias is utilities will prefer to spend their own money that they can then control rather than bring in 3rd party money (page 32)
- Information asymmetry (page 33)
- Inertial tendencies - the fundamental changes occurring in technology, markets, and consumer demands create a greater risk to the State from ignoring these factors and straining to maintain existing systems (page 36).

In brief – Order adds these ways of making money in addition to traditional cost of service [p24-7]

- Regulated earning Ops
 - PSRs
 - EAMs
 - System efficiency etc
- Competitive Market Based Earnings
 - Unregulated utility subsidiaries are authorized to engage in competitive value-added services. To engage in these activities the utilities must have in place standards of conduct to avoid affiliate abuse, to be monitored by the Commission.
- Data Access (and charging)
- Clawback Reform
- Standby Services
- Opt-in rate design
- Large Customer demand charges
- Scorecard metrics

Platform Service Revenues (p12)

- The White Paper recommended a transition toward Market-Based Earnings (MBEs) for utilities, to complement conventional cost-based earnings and, eventually, to provide the bulk of utilities' financial incentives. (The concept of “MBE” as proposed by Staff is combined, in the discussion below, with Platform Service Revenues (PSRs). In order to avoid confusion, this order will use the term “PSRs” throughout.)
- PSRs would be earned by utilities through their provision of Distributed System Platform (DSP) services. Increased PSRs would encourage utilities to support access to their systems by DER providers, and offset required base revenues derived from ratepayers.
- While the White Paper acknowledged that this transition would take a considerable length of time, it recommended that demonstration projects and other initiatives should be oriented toward developing PSR opportunities. The ultimate purpose of the transition is to create “a business and regulatory model where utility profits are directly aligned with market activities that increase value to customers.”

Specific PSR Earning Opportunities

p24

- Platform service revenues are new forms of utility revenues associated with the operation and facilitation of distribution-level markets.
- In early stages, utilities will earn from displacing traditional infrastructure projects with non-wires alternatives.
- As markets mature, opportunities to earn with PSRs will increase.
- A process is established to facilitate the approval of products and services that could generate PSRs, and for the pricing of those services and the allocation of revenues between ratepayers and shareholders.
- This process will distinguish between
 - (a) services that the Commission will require the utility to provide as part of market development;
 - (b) voluntary value-added services that are provided through the DSP function that have an operational nexus with core utility offerings; and
 - (c) competitive new services that can be readily performed by third parties, including non-regulated utility affiliates, and should not be offered by regulated utilities.

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.

EAMs: What is at stake here? Not much at the moment p 67

- Staff proposed that the size of EAMs should be negotiated in rate cases
- Review of other jurisdictions
 - Illinois' legislatively defined program, 0.38% of utility revenue is at stake in a negative-only direction.
 - RIIIO program, 6% of revenues in a quasi-symmetrical system.
 - Current incentives in New York, described above, range between 2.77% and 5.69% of delivery revenues on the negative side and between 1.33% and 2.49% on the positive side. These figures reflect percentages of delivery revenues. Stated as percentage of total bills, the ranges are 1.13% - 2.59% on the negative side and 0.49% - 1.03% on the positive side.
- As initial bounds on the first round of REV initiated EAMs, the maximum amount of earnings should not be more than 100 basis points total from all new incentives.
 - Using state wide averages, 100 basis points are equivalent to 2.4% of delivery rates or 1.1% of total bills. The total relative number of basis points can be higher if higher ratepayer value is demonstrated through the benefit cost analysis associated with the incentive (for example, this may be the case with system efficiency).

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		

Blogs on 19 May 2016 NY REV Ratemaking Order

- RMI blog on Order
http://blog.rmi.org/blog_2016_05_20_new_yorks_next_steps_in_the_rev_of_utility_revenue_models_with_ders/416623/
- Utility Dive NY REV Order
http://blog.rmi.org/blog_2016_05_20_new_yorks_next_steps_in_the_rev_of_utility_revenue_models_with_ders/416623/
- Utility Dive Chicago ComEd <http://www.utilitydive.com/news/chicagos-rev-how-comed-is-reinventing-itself-as-a-smart-energy-platform/416623/>
- California: <http://www.utilitydive.com/news/how-california-wants-to-align-utility-revenue-models-with-ders/417029/>
- <http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M159/K702/159702148.PDF>