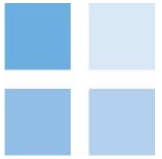
Future regulatory options

Workshop slides

23 June 2016



Agenda

1. Introduction
2. Regulatory frameworks (structure, process and revenue setting)
3. Assessment criteria
4. Case studies – RIIO, NY REV and California
5. Strawmen – structure
6. Strawmen – process / revenue
7. Additional Q&A
8. Annex

1 INTRODUCTION

Introduction

Context of the report, scope of work, objectives

- Utilities around the world are facing challenges of accommodating changing technology, and ENA and CSIRO are considering whether there are alternative ways of regulating electricity networks to allow Australia better to meet these challenges.
- Regulation of energy networks should focus on the natural monopoly services provided by networks, these are sometimes referred to as 'core' network services (but definitions vary) – access to the grid, and the benefits it provide, being the key network service.
- A future regulatory framework, the disruption from new technologies and better data (e.g., bi-directional flow requirements, off-grid option), needs to be considered with regard to the changing nature of the services offered (and required) by the networks.
- We are considering the regulatory framework for 2027 rather than today.

Our options have been informed by discussion with Professors David Newbery and Stephen Littlechild.

Our task

The regulatory framework for electricity network infrastructure services in 2027

Key objective:

Recommendations on a regulatory framework design that incentivises the optimal delivery of services in the long-term interests of customers.

Questions outlined in the NTR:

- Is the current universal service obligation appropriate in a transformed energy market?
- Are there appropriate options to vary the risk over time or to manage the risk allocation between customers?
- How should economic regulation respond to emerging competition in and contestability for grid services?
- What issues will affect the successful transition of economic regulation over time to the transforming electricity market?

RPI-X – original application in the UK (1)

Extract from the original Littlechild (1983) paper

"From the point of view of public policy, the primary purpose of regulation is to protect the consumer. The primary purpose should be distinguished from the secondary purposes. Inefficiency and high costs, and the ability to earn excess profits and pay high wages are of significance insofar as they lead to higher prices for the consumer. The consumer's prime concern is with the range and quality of the goods and services he is offered, and the terms on which these goods and services are offered, rather than with the reasons lying behind it all. The means should not be confused with the ends.

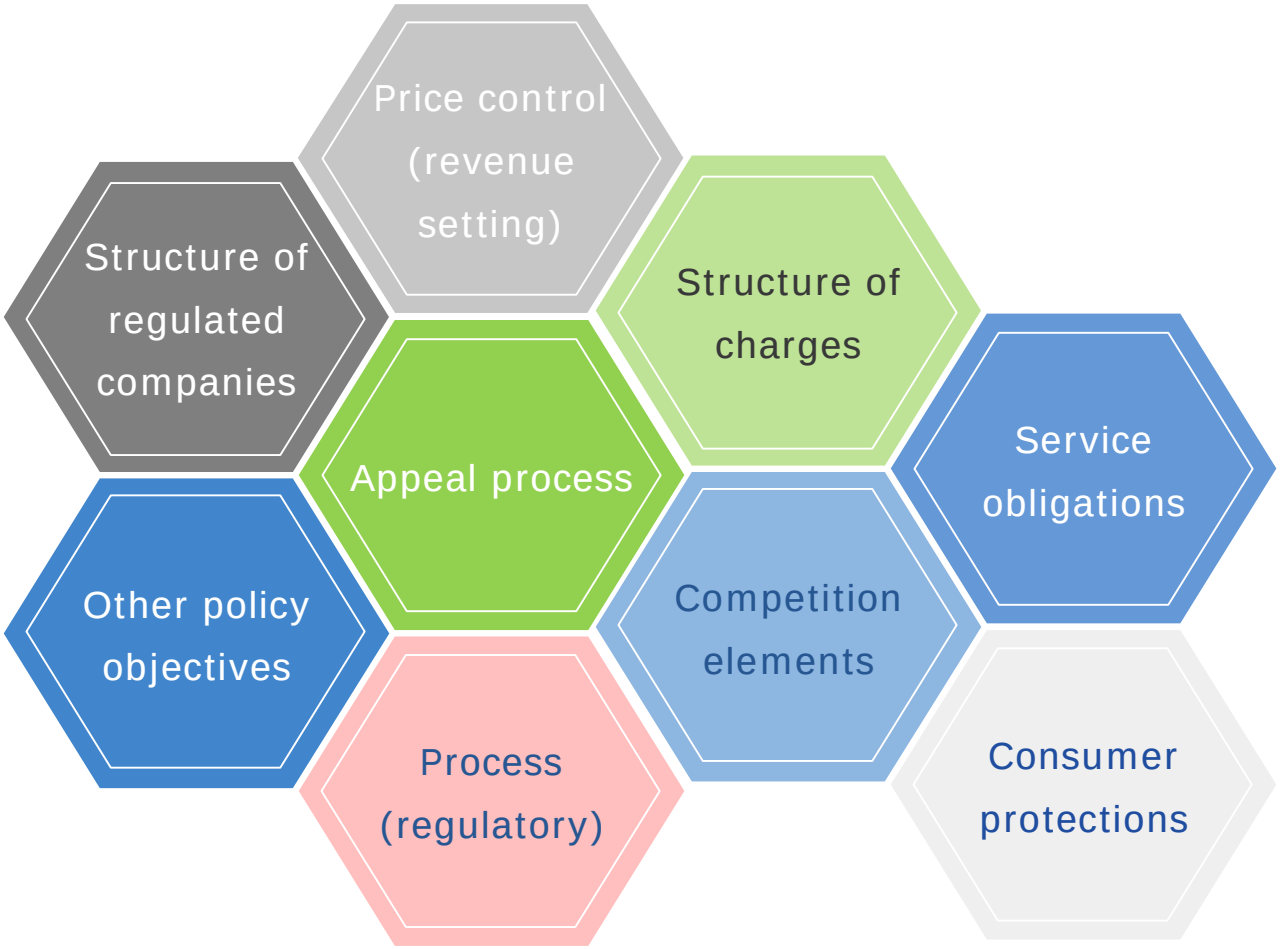
The original 1983 report considered proposals to regulated British Telecommunications (BT). RPI-X regulation seen as a temporary fix, at a time of rapid technical change, until competition was sufficiently developed so that regulation not needed.

RPI-X – original applications in the UK

Evolution

- No regulatory asset values – these came later…
- …and even now, regulatory asset values in the UK do not have legal force (but credible commitment to reasonable return of and on investment)
- No building blocks approach – key original assessment was ensuring appropriate dividend stream for companies
- The current regulatory architecture was developed later – was it inevitable?

Components of a regulatory framework



Out of scope today

Range of issues and time constraints means not all factors covered today

'Regulatory framework' covers a very wide range of factors.

In order to keep the workshop relatively focused on a core set of issues we will only touch on the following issues:

- Structure of charges. Structure of charges can be a core element of a regulatory framework. This is an area that is already receiving significant attention in Australia an worldwide. We assume that structure of charges is a critical element and that cost reflective charging impacts on the ability of DNSPs to send the right price signals to operate their networks efficiently.

Perverse incentives can already be seen in GB arising from the structure of charging in relation in the capacity auctions. Generators were connecting on the distribution network as they receive an overinflated embedded benefit (avoiding transmission charges).

- Customer protection
- Environmental policy. We only make the assumption that a future regulatory framework will need to be flexible to allow for environmental policies.
- Appeal process. Our initial view is that a robust appeal process is critical, but the extent of this depends on how the process of the regulatory framework is set up.

ENA/CSIRO proposed principles

A. **Focused on the long term interests of customers** – Regulatory decisions on remaining regulated services should account for the perspectives and priorities of both current and future customers. They should focus on providing a stable framework for investments that deliver the connectivity and access to bi-directional electricity services that customers value.

B. **Flexible and enabling for emerging technology, technology diffusion, new competition and marketplaces** – Efficient competition should be allowed to emerge, with flexible and dedicated processes to recalibrate or remove regulation where appropriate. Rules should be nimble and facilitative, enabling prompt market action.

C. **Able to align network incentives with long term customer value** – The regulatory framework should provide clear revenue and profit opportunities for delivering services that create value for customers and market actors.

D. **Proportional and bounded** – In an environment of increasing contestability and competition, regulatory intervention needs to be well justified and proportional to the risks of a clearly identified problem. Further, its application should account for the costs and benefits of intervention. Robust independent processes are needed for regularly evaluating the boundaries of competition, considering the full range of costs and benefits.

ENA/CSIRO proposed principles

E. **Non-discriminatory** – Network service providers should be free to deliver valued, efficient energy service solutions to each customer. The framework should not be reactive or 'permission' based. It should provide a competitively neutral platform that does not pre-define a single 'ideal' network business model.

F. **Consistent, coherent and knowable for all participants** – Regulatory rules should continue to be consistent across Australia, and they should be predictable, simple, precise and knowable in advance, to facilitate least cost market participation and efficient investment. Regulatory decisions that share risks across networks, debt and equity providers, and customers need to be conscious, consistent with the risk compensation provided in the framework, and predictably implemented. Similarly, cost recovery should align with those customers that initiate the system cost.

G. **Independent and accountable** – Regulatory rules should be applied and enforced independently, commonly, transparently and accountably, including the rights to reasons and appeal for consumers and businesses whose interests are materially affected.

Criteria for assessment of models

Principle	Questions
A	Are customers' values reflected in rates and services (Does the regime set the right incentive for service quality?)? Does it provide a stable framework for investment (Do companies have the opportunity to earn a reasonable return on investment?)? Does it facilitate bi-directional electricity services access (Is the company appropriate considering DER to contain costs?)?
B	Does it allows for innovation (Is the company considering/ using new technology?)? Is the regime nimble/ flexible to allow competition to develop? (Note, flexibility could reduce stability for investment.) Does the regime provide neutral incentives across different solutions (e.g. DER instead of augmentation)?
C	Are incentives linked to customer value?
D	Is the regulatory intervention proportionate?
E	Does the framework allow a choice of network business model which best meets policy objectives?
F	Are the regulatory rules consistent, coherent and knowable? Are risks allocated appropriately (are risk on companies appropriate (i.e., not excessive)? Are risks on consumers appropriate? Is the allowed rate of return commensurate with the company's operating risk?)?
G	Are the regulatory rules applied and enforced independently, commonly, transparently and accountably? Is there a right to appeal for network companies and consumers?

2 REGULATORY FRAMEWORKS (STRUCTURE, PROCESS AND REVENUE SETTING)

Structure, process and level of revenue

Three core elements define economic framework

Structure

- Who does what?
- Which activities are regulated which are competitive (or may become competitive)?
- ISO?
- DSO / DNO?
- Voltage level for T vs D

Process

- How are rules set?
- Which organisation sets prices?
- What is the appeal process?
- What are the default rights and obligations of parties?
- How are outputs set?

Revenues

- What are the economic drivers of revenues?
- Is it cost-driven, or value driven?

Structure – Who Does What?

Boundary of DNSP activities?

- Microgrids
- Storage
- Metering
- Collection and distribution of data about customer electricity consumption/ production, network data, and analysis of this.
- Other changes to network configuration where activities are contestable, potentially contestable.

Existence of DSO / TSO

- Is the planning and control of the networks to be separated from the provision of assets?
- If so, how is the DSO / TSO incentivised? Should it be a public / administrative authority? Or is it controlled by other stakeholders? If so what is the governance of that? How is it regulated?
- Is a distribution level market operator for network services required? If so is the DSO (separate or combined) best positioned to provide these market services?

How does Universal Service Obligation (USO) change in response to changing technology? Does the USO need to reflect different service/ reliability levels?

Process – how to decide who does what?

Level of customer engagement

Regulator dictates, with appeal process?

- "classic" arrangement

Parties propose agreement, with arbitration

- "deregulated"

Other approaches to involve customers in process:

- Customer engagement

Organisations for determining rules

- Single regulator
- Regulator / rule-maker (Australia – AER/AEMC)
- Alternative governance arrangements (e.g. industry codes)

Approaches to revenue/ price estimation

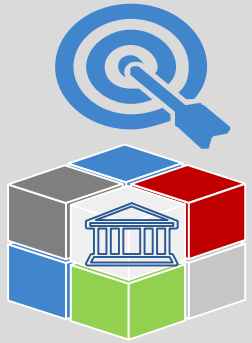
From cost based to value based pricing

Rate of return

Building blocks (Regulator judgement on outputs)

Building blocks (Customer engagement)

CPI-X (TFP)



Regulatory settlement (building blocks)

Information disclosure

Competition (Market determined prices)

Regulatory frameworks

Australian arrangements

- Economic regulation.
  - A revenue-cap is set for each company based off of a UK type building blocks regime. Estimates for operating expenditure, capital expenditure (and the regulatory asset base) and the cost of capital are calculated for each regulated company.
  - There is an incentive for companies to outperform the allowance set by the regulator as they are able to retain part, or all off, the outperformance (and thereby earn their shareholders higher returns). The shareholders also bear the risk of lower returns from underperformance.
  - Additional incentives, such as the use of demand management to offset augmentation expenditure are also added.
  - Ring fencing provisions limit network operators (or its affiliates) ability to confer an unfair advantage in a contestable market.
  - The regulatory asset base is rolled forward (financial capital maintenance). Therefore, stranding risk transferred to customers. This has led to a low cost of capital.

4 CASE STUDIES

Case studies

Evolution not revolution

We have reviewed a number of innovative electricity network regulatory regimes which have been implemented or are currently being proposed/ designed:

- California PUC
- NY REV
- RIIO

We provide a summary of the above regimes, then we provide a high level comparison and some observations.

All the regimes follow a broadly similar approach for regulation of core network services:

- A ‘platform’ framework– building blocks or cost of service.
- Additional outputs and incentive mechanisms placed ‘on-top’ of the platform.

Summary of Californian approach

Cost to serve fundamental	The standard cost-plus / rate of return approach to regulation remains fundamental to the regulatory approach for networks (D and T), albeit with specific state approaches to implementation.
Legislated obligations	State government has imposed range of obligations related to type of generation, storage, demand reduction schemes which utilities implement.
Specific incentive schemes	Range of initiatives to allow new technologies to be accommodated and encouraged within the framework.
More radical developments being considered	Discussions about more radical alternatives taking place.

California - takeaways

Successes

- Strong take up of PV has been accommodated
- Clear guidance from government with incentives for implementation means objectives can be achieved
- Well understood regulatory framework with checks and balances
- Low implementation risk

Considerations

- Market developments may lead to action only slowly
- Interaction between federal and state regulation (e.g. can aggregated DMS bid into wholesale market)
- Perception that structure hasn't led to neutral deployment of DER (hence calls for IDSO)

Summary of NY REV approach

Cost to serve fundamental	The standard cost-plus / rate of return approach to regulation remains fundamental to the regulatory approach for networks. The networks will be able to earn additional platform service revenues (fees on new services).
Legislated obligations	There are numerous restrictions and obligations placed on the networks. These include the restriction of owning DER (with a few exceptions), energy efficiency targets, universal service obligation.
Specific incentive schemes	Introduction of a range of incentive schemes (earning adjustment mechanisms) including: Peak reduction (and load factor), customer engagement, affordability, interconnection and energy efficiency.
More radical developments being considered	Shifting to utilities as Distributed System Platform (DSP) operators. In early stages Utilities will earn revenue from supplanting traditional capex with non-wire alternatives. Eventually DSP are to facilitate markets for third parties.

NY REV - takeaways

Key points

- Utilities have opportunities to earn higher returns on specific projects which incorporate non-wire-alternatives.
- Incentives geared to moving Utilities to platform service providers i.e., Utilities to operate the market for ESCOs (transfer of capital risk to third parties).
- View that increased customer information/ access to markets will increase capital productivity. Markets seen as a way of reducing the information asymmetry in rate setting.
- Utilities will not be able to compete in competitive services, with the exception of where market participation helps build markets.
- Unregulated affiliates will be able to compete with standards of conduct in place.

Considerations

- The incentives across DER and traditional capex solutions not fully equalised.
- Due to the 'experimental' nature of the regulation seeking new business models there will be lots of customised solutions across the Utilities.
- Significant ongoing and increasing regulation to allow for the development of the market based services.
- Different overall structure to Australia, i.e., retail market underdeveloped, vertical integration.

Summary of RIIO approach

Revenue estimation fundamental	Traditional building blocks approached used, however totex benchmarking and pre-determined capitalisation rates used.
Legislated obligations	Carbon reduction targets, universal service obligation.
Specific incentive schemes	Time to connect and connections engagement; Losses discretionary reward; Guaranteed standards for connections; Guaranteed standards for severe weather; Guaranteed standards for reliability; Broad measure of customer service; Health index; Interruptions incentive scheme; Totex efficiency incentive; Menu, with an ex ante reward
Radical developments	Fast-tracking process, eight year price control, totex benchmarking,

RIIO - takeaways

Successes

- Fast-tracking appears to have created pseudo-competition between the DNOs in relation to unit costs. Also allowed for 'proportionate' treatment of business plans.
- Totex and innovation incentives (and application of smart grid savings) encourage the use of DER.
- Menu designed to ensure DNOs deliver accurate business plans ('incentive compatible' with shareholders aims).
- Better business plans and enhanced customer engagement. (Combined with fast-tracking, this created a sort of regulatory settlement.)
- Range of incentives (new or increased strength) targeted to outputs.
- Continued increases in competition for some services. Also explicit allowance for third party competition for some clear defined and differentiated network assets/services.

Considerations

- Ofgem has identified that the current pricing signals do not encourage the efficient use of DER.
- Customers are engaged, but Ofgem remains final decision maker – including across outputs and incentive rates.
- Ofgem has not yet decided on the role DSO will play. They have identified a number of barriers – hesitance to adopt new practices as BAU, lack of clarity around key arrangements including how DNOs engage with consumers for 'flexibility' and the relationship/interaction/overlap between the DSO and TSO.
- Outside of the price control, a Government policy decision created a separate entity (the Data Communications Company) which manages all the flow of data from smart meters to networks, suppliers and other authorised third parties.
- The fast-track process has been criticised for potentially over-rewarding companies.

High level comparison

Fundamental differences in industry structure

Core features:

- Economic regulation, either building blocks or cost of service still used for ‘core’ network services.
- No regime has the full ‘solution’ yet.
- New services/ outputs/ solutions typically being incentivised through financial incentive mechanisms on top of base revenue.

Framework structure assumptions:

- NY assuming platform (market) operations carried out by the Utilities – incentives are being geared to this.
- RIIO agnostic, flexible to develop depending on business model choices – incentives geared to better outputs and network operations.
- California, top-down mandated approach – not clear what the flexibility is for business model options.

Other regimes types/ mechanisms

What can we learn from other sectors/ proposals?

We have also considered alternative approaches to the full case studies above. This includes:

- A CPI-X using total factor productivity (TFP) for the X-factor. Used for a price-cap regime. Initial prices still need to be set.
- Greater role for consumers – Water Industry Commission of Scotland (WICS). Role for consumers to agree outputs with the regulated company. Decisions based on range of 'input' information provided by the regulator and regulated company.
- Negotiate Arbitrate regime – Sydney Airport. Airlines negotiate with Sydney airport on prices and services. ACCC publishes reports on prices, costs, and profitability of aeronautical revenues at Sydney, Melbourne, Brisbane and Perth airports.
- Information disclosure regime. No explicit regulation. Detailed information on prices, service performance and profitability published. Consumers have the ability to refer company to the regulator/ competition authority if they have concerns.

5 STRAWMEN - STRUCTURE

“Strawmen” structure (1)

The requirements of operating networks with bi-directional flows, incorporating DER and other services (such as a greater range of ancillary services) in their planning means that DNSPs roles are changing. The range of services (new and old), and who delivers them, will be influenced by the structure that is put in place.

The chosen structure may influence the networks’ final business model, but the choice of structure should be made in line with the intended objectives/ principles of the regime.

Key changes:

- More complex distribution system operation
- Electricity market facilitator role which encompasses a greater range of DER
- Real time consumer data to support system and market operation

Strawman structural (2) options

Possible future structures for Network Service Providers

	Market and SO	Integrated SO*	Separate SO*
System operator role. At a minimum responsible for network planning and purchasing of ancillary services.	✓	✓	✗
Network asset management, ownership, and operations (access). Excluding planning and purchasing of ancillary services.	✓	✓	✓
Data provision. Access and deliver metering data.	✓	✓	✗
Market operator. NY REV style market operators (for new platform services).	✓	✗	✗
DER ownership. Storage, DSM and DG.	No, but…	No, but…	Yes, but with rules

* With or without data provision

“Strawmen” structure (3) competition

Competition development

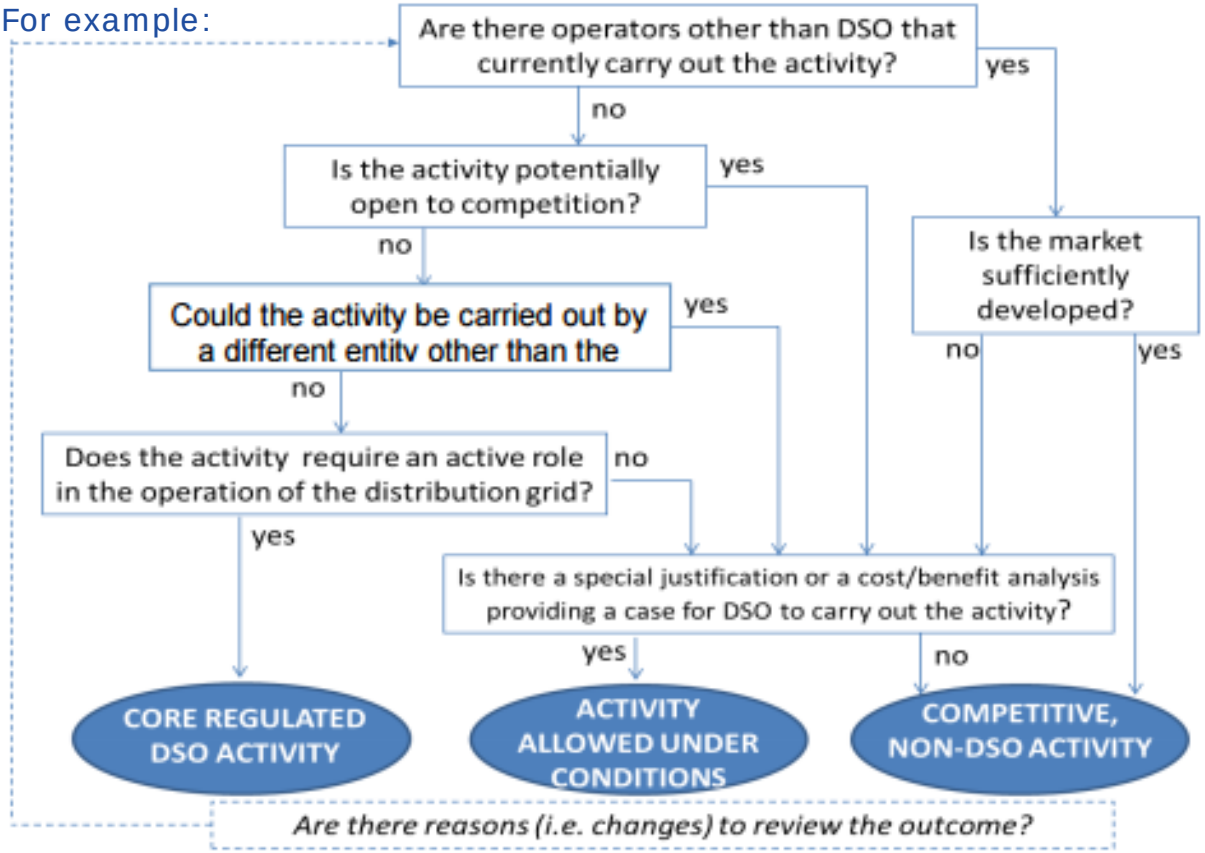
Process for assessing regulated / non-regulated services:

- Are the services contestable?
- Are they able to become contestable?
- Is there a reason why the DNSP should carry out the service?
- How developed are the markets?

“Strawmen” structure (4) competition

Competition development

For example:



Source: CEER

* CEER definition of DSO is a DNSP which may or may not do SO functions

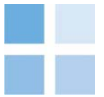
Strawman structural (5) options

Questions

- What are the pros/ cons of the different options? Do they create barriers to DER/ innovation/ competition?
- Where is the boundary between DSO and TSO? Separate/ combined?
- Is data collection/ provision separate? Does it matter?
- Considering the different structural options, should there be any restrictions on DNSPs can ownership of DERs? How, if at all, will competition be impacted?
- Besides customer protection requirements, what specific obligations might remain on the DNSPs? How will the USO adapt?
- Are there other options?

6 STRAWMEN – PROCESS / REVENUE

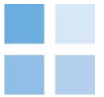
“Strawmen” process / revenue (1)



Negotiate arbitrate

- The establishment of a negotiate arbitrate regime requires customer representatives to agree a range of outputs and revenues with DNSPs. Applicable to all the structures.
- A regulatory body provides guidelines for the agreement (customers/ users need to be clear on what they are bargaining for e.g., signing up to investment in long-life assets [future consumers], or less reliable supply).
- If an agreement is not reached then the regulator steps in and uses building blocks to estimate the required revenue.
- Information disclosure and service quality monitoring used.
- Any USO adjusted to reflect express customer desires (with consumer protections in place).

“Strawmen” process / revenue (2)



Partial regulatory settlement

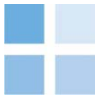
- The regulator employs a fast-track type approach.
- Network operators required to produce business plans that show engagement with customers and a clear link between revenue requirements and outputs. This will include detailed planning on solutions to achieve integration of new technologies and innovations.
- The regulator provides guidance to the network operators on the range of inputs that they should consider.
- After a high level assessment, if the regulator does not consider that the plan to be acceptable then it will proceed with a full building blocks analysis.

“Strawmen” process / revenue (3)

System operator incentivised

- Competition for electricity access has started to be established.
- CPI-X (TFP) price-cap regime adopted for existing ‘core’ network services (bi-directional access to the grid) with stable charging structures.
- Initial prices are set using building blocks, but focusing only on historical expenditure.
- Transfer of demand risk to network operators.
- SO regulated with incentive regime.
- Third party competition established for new and replacement services.

“Strawmen” process / revenue (4)



Questions

- What are the pros/ cons of the different strawmen?
- Under negotiate arbitrate will the parties be able to agree an appropriate risk allocation? Is the risk allocation different under the partial regulatory settlement?
- Would a price-cap approach (rather than revenue-cap) produce better risk allocation?
- How do the options rate against the relevant assessment criteria?
- Are there other options to consider?
- Does the choice of revenue/ process influence the structure?

Revenue setting enhancement options

DER incentivisation options

	Totex	Peak reduction incentive	Project specific incentivisation
Approach	• Use total expenditure with fixed capitalisation rather than separate capex and opex. • Need to specify 'depreciation period' for opex.	• Financial incentive to reduce peak demand (load factor).	• Opportunity to earn an incentive in excess of traditional capex on specific project (incorporating non traditional capex solutions).
Pros	• Neutralises incentive on companies to invest rather than use opex solutions. Therefore, better for non-network solutions.	• Specifically targets peak demand. • Leaves choice of solution up to network operator.	• Provides strong incentive to consider non-traditional solutions to delivering services. • Each project can be assessed on its merits.
Cons	• Potential financeability issues if opex becomes a greater proportion of totex. • Current evidence from GB indicates that DER is not fully integrated into networks BAU.	• Maybe difficult to set target. • Ability to reduce peak demand may be outside network operator's control. • Incentive may reduce relatively quick as load profile flattens. • Does not specifically encourage DER.	• Requires consideration of each project. • Does not necessarily incentivise the use of DER in BAU.

7 Q&A

8 ANNEX

Revenue setting approaches

Currently used revenue setting approaches

Approach	Description
Traditional rate of return	Focus is on determining a reasonable rate of return. Opex based on a historical or 'test' year. Capex based on forecasts.
Building blocks (regulator judgement)	Regulator determines efficient opex and capex, and a reasonable rate of return. The regulator makes the decisions around outputs. Research and analysis can inform this, but no formal engagement of customers.
Building blocks (customer engagement)	Varying levels of customer engagement on top of building blocks approach. Customer engagement helps inform the decision on outputs, but the regulator still makes the decisions
Building blocks (regulatory settlement)	Varying approaches. Partial regulatory settlements - Fast tracking (enhanced business plan status) used to agree well justified business plan; Range of inputs determined by regulator and customers / company use these to agree outputs. Full regulatory settlement – regulator facilitates direct negotiations between customers and regulated company. Outcomes are binding. Regulator is last resort if deal is not reached.
CPI-X (TFP)	No detailed analysis of the building blocks prices are taken as set at the start of the period and rolled forward based on CPI and a TFP adjustment (input price changes may be taken into account, but this increases the analysis required). Allows for competition to evolve.
Competition (market determined prices)	Sufficient competition across all services is established which means regulation is not needed (aside from a competition authority and, potentially, binding standards).

CPI-X (TFP)

Indices used to set future prices

Prices (tariffs) are indexed to CPI with an adjustment for productivity (and potentially input prices). The premise is that prices decrease (increase) in real terms based on the X-factor. A relatively simple way of setting the X-factor, is to use a total factor productivity (TFP) index, economy-wide or sector specific.

The CPI-X formula would apply only to monopoly services as a price-cap rather than a revenue cap.

If regulation is being set for the first time then one approach is to assume the starting price is appropriate. An alternative is to use building blocks to set the initial price. Under this former approach, the key difference to the current Australian approach is to remove the assessment of forecast capex and opex (and simply rely on the TFP index).

Enhanced consumer engagement – case study – WICS

The Water Industry Commission for Scotland (WICS)

During its most recent price control setting for Scottish Water (SW) for the price control period 2015-2021, WICS established a consumer forum with nine members – mix of customer focussed representatives, retailers, chamber of commerce and a former politician (the chair). The Forum's role was to "identify customer priorities and to secure the best outcome for customers within ranges of key inputs … set by the Commission" (WICS [2014], page 4). The Forum engaged directly with SW to represent the concerns of customers.

WICS believes that the use of the Customer Forum led to proposals which better reflected customer priorities for improvements in costs and levels of services.

The Commission relied on a building blocks approach to establish the range of key inputs. The Commission estimated the inputs prior to SW publishing its draft business plan and then immediately after this.

Financial 'tramlines' were put in place around three financial metrics – adjusted cash interest cover, gearing and FFO: net debt. Adjustments/ sharing occurs (during the price control) based on SW's performance against these metrics.

Information disclosure

Not a commonly used approach in electricity regulation

Information disclosure regimes rely on the regulated firm providing information to customers and the regulator. The exposure of this information can then be used by the regulator to monitor the regulated firms prices and be used by customers to negotiate around the regulated firms prices (but with no obligation). The regulator can step-in when it considers firms are not acting in the customers long-term interests.

This type of regime:

- Focuses on outputs.
- Is light touch, but with the ability of the regulator to be heavy handed.
- Needs credible rules (threat) if the regulated firm is not playing fair.
- Provides scope for competition to develop.

Negotiation – case study – Australian airports

- Price regulation of airports (except for limited regional services) ceased in 2002, further inquiries in 2006 and 2011 found no evidence of misuse of market power.
- ACCC publishes annual “monitoring reports” on prices, costs, and profitability of aeronautical revenues at Sydney, Melbourne, Brisbane and Perth airports.
- Airports negotiate with airlines. The Board of Airline Representatives Australia is authorised by ACCC to negotiate on behalf of its members.
- Costs, revenues, cost of capital and associated parameters provide the framework for contractual agreements which echo other regulatory regimes.
- There is a threat of more intrusive regulation is an agreement is not reached.