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Economics Consulting in Utilities and Infrastructure

The changing approach to economic regulation of utilities

SLECONOMICS REGULATORY INSIGHTS



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Economics Consulting in Utilities and Infrastructure



slEconomics is a boutique economics consulting firm providing specialised advice to governments, regulators and corporate clients in the area of utilities and infrastructure. We are based in Sydney and Melbourne Australia and have an international network of associates to bring global experience to local initiatives.

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Introduction

- Regulatory frameworks are constantly adjusting to dynamic policy, industry and macroeconomic environments. E.g.
 - The underlying objectives of economic regulation are subject to changing government policies.
 - The imperfect nature of economic regulation leads regulators and stakeholders to search for improved methodologies to suit changing circumstances of the industry

These dynamics are reflected in the way we think about regulatory approach.



Regulatory rules and policy guidelines

 These broad trends in economic regulation are reflected in an operational sense through regulatory rules and policy directives. E.g.

Minimising regulatory intervention	 Fixed price paths (i.e. CPI – X) Enhanced customer consultation
Incentive based regulation	 Duration of control period
Reducing regulatory discretion	Automatic adjustment mechanismsPolicy directives
Adapted regulatory models	 Cost of capital, financeability criteria, earnings band triggers
Expanding scope of utility regulation	 Renewables, carbon tax, smart metering, etc

These trends and underlying implications for regulatory approach are illustrated by way of brief snapshots of local and global practices in the slides that follow

Regulatory intervention and market based risk

- In attempting to establish some level of *revenue certainty* there is a trade-off between regulatory risk and market risk:
 - Regulatory risk can be minimised (but not completely eliminated) by use of a fixed revenue allowances.
 - However, revenue certainty can amplify volatility in earnings where underlying costs are unpredictable and difficult to manage.
 - Cost adjustment mechanisms are often utilised whereby the revenue allowance varies to mitigate market based risks.
 - Placing greater reliance on regulatory intervention to manage market based risks increases the potential for discretion rather than rules in regulatory decision making.
- Traditional aspects of risk management apply.
- Robust regulatory design requires an assessment of the balance of risks and feasibility of mitigation measures that can be applied.



- Certain aspects of a fixed and variable revenue approach are applied under the principle of recovery of efficient costs of service.
 - Certainty in cost recovery is meant to be provided for broad components of the utility's cost base..
 - Automatic adjustment mechanisms address changing input costs and ideally minimise the regulators discretion in application of the tariff adjustments.
 - Risk of *cost recovery* is retained for those areas that do not have adjustment mechanisms and are ideally suited to areas that are relatively controllable and predictable.
 - In these cases, allowed revenue is fixed regardless of actual cost of supply.
- In applying the standard of efficient cost of service some level of regulatory judgment will ultimately be required.
- The potential for adverse consequences of regulatory interventions must be weighed against the ability to manage market based risks though other methods.

The evolution of incentive based regulation

RPI-X regulation

- In looking at trends in regulation, it is perhaps appropriate to first look back to the advent of RPI – X regulation some 30 years ago. (see end note 2).
- RPI X was originally seen as a low intervention / high powered incentive approach to price control.
- The framework has become more complex over time in attempting to jointly incentivise efficiencies, allocate risks, and promote investment.
- These multiple objectives have proved difficult to achive, with Ofgem (seen as one of the originators of RPI-X) recently deciding to change regulatory approach to better meet these types of objectives.

Ofgem's " RPI-X @20" and "RIIO"

- A major review of RPI-X regulation was carried out by Ofgem ending in 2010.
- The review was driven by the challenges facing the UK Transmission and Distribution sectors in building capacity for a low carbon ESI.
 - I.e. system wide costs of implementing renewables policies.
- In completion of its review Ofgem began implementation of the "RIIO model".
 - I.e. "Setting R evenue using I ncentives to deliver I nnovation and O utputs".

RIIO - Output performance and revenue

As described by Ofgem, the price control decision will be based on the **primary outputs** that the network company is expected to deliver and the revenue it is to achieve for doing so.

Output performance measures



Performance based revenue

- In some ways RIIO is similar to a large long term service contract.
 - Base revenue / price for services
 - Provisions for pass though of costs.
 - Performance base incentive / penalty mechanisms.
 - Review (re-opening) of contract under defined circumstances.
 - Major review of contract on a periodic basis.



Enhanced customer engagement

 Regulators are aiming to minimize intervention - particularly in regard to investment decisions and capital expenditure - through enhanced consultative processes.

 Ofgem's RIIO model is one example whereby customers are to take a greater role in providing input to the proposed business plan (i.e. capital projects entering the RAB)).

 The Australian Energy Regulator (AER) provides another example of enhanced customer engagement.

AER "Better Regulation Program"

- Creation of seven new guidelines outlining the approach to receiving and assessing network business' expenditure proposals and determining electricity network revenues and prices.
- Establishing a consumer reference group for guideline development work to help consumers engage across the broad spectrum of issues.

 Establishing an ongoing Consumer Challenge Panel to ensure network regulatory determinations properly incorporate
 consumers' interests.

NB Characterisation of the AER programme as a 'recent trend' is probably overstating the point - noting the wide spread use of public advocate agencies in the US regulatory hearings.

Incentives, regulatory intervention and duration of the control period

Incentives for cost efficiencies

- Longer duration control periods are sometimes thought to be conducive to incentive based regimes in that efficiency benefits are often retained by the utility to the end of the control period.
- E.g.: Ireland's regulator stated that:
 - "the longer the control period, the greater the short-term incentives for efficiency gains, but the greater the potential for forecasting errors to result in excess profits. If excess profits are unacceptable, there may be pressure to re-open the price control formula, which tends to undermine longterm incentives for efficiency".
- NB. However, 'rolling incentive mechanisms' can be applied whereby the utility obtains a uniform period of benefits (say 5 years) no matter which year of the control period gains were initiated.

Regulatory intervention and business planning

- Ofgem has recently moved to an 8 year control period for network businesses – with a review after 4 years.
 - Ofgem's objective is to encourage network businesses to plan on a long term basis.
 - While not stated as such, the provision of long term business plans also provides important information to the regulator in assessing proposed capital expenditures and major maintenance costs.
 - Other considerations would be the reduced workload in administration of the price control, although tariff adjustment mechanisms would likely need to be administered during a long duration control.

A few examples of regulatory control periods.

Jurisdiction	Coverage of price control	Duration of price control	Inter-period tariff adjustments	Mid term review	
India	Generation, transmission, distribution costs	5 years	Yes	Yes	
Great Britain	Transmission and distribution costs	8 years	Yes	Yes	
Ireland	Transmission and distribution costs	5 years	Yes	Allowed on a case by case basis	
Kenya	Generation, transmission, distribution costs	3 years	Yes	Not prescribed	
Thailand	Generation, transmission and distribution costs	5 years	Yes	Not prescribed	
US	Generation, transmission and distribution costs	Filing allowed for tariff adjustment at any time	Yes	Not applicable (i.e. utility may file at any time)	
South Africa (Airports and petroleum	Airport charges	5 years	Yes	Allowed in 3 rd year	
pipeleines) Petroleum pipelines charges		Tariff in effect until review requested.	No	No	

Duration of control period and volatility in costs

Longer control periods with fewer pass through mechanisms are typically found in <i>network sectors.</i>	Shorter control periods, or greater use of cost adjustment mechanisms are often applied to generation and retail supply .		
<i>i.e.</i> Costs and sales revenues are relatively predictable and controllable over longer periods of time.	i.e. The cost of fuel / wholesale energy are difficult to predict and control from year to year.		

NB. Airports Company South Africa's regulatory approach provides an interesting hybrid.

- The control period is 5 years, but the determination can be reviewed on application to the regulator with a new determination provided for (what were) years 4 and 5.
- The new determination 'refreshes' the cycle, with a new 5 year control period and allowance to apply for a review in the 'new' years 4 and 5.
 - ACSA has made use of both provisions.
 - Currently the full 5 year determination is being seen through.
 - ACSA has previously applied for new determinations on a 3 yearly basis.

Reducing regulatory discretion

- There is some evidence to suggest a trend in design of the 'scheme of regulation' in limiting the regulator's discretion in determination of allowed revenues and tariffs..
 - i.e. In Australia the National Energy Law provides an extreme example of legislative constraint placed on the regulator.
 - NB. Chapter 6A of the National Electricity Rules devotes almost 60 pages to the general obligations of the Autralian Energy Regular (AER) in making a transmission revenue determinations.

- In the AER's determination of transmission revenues the National Electricity Rules prescribe matters such as (short list only)
 - Means in which the prudency or efficiency of capital expenditure is to be assessed.
 - Method for rolling forward the RAB
 - **NB**. Inclusive indexing the asset base each year of the control period.
 - Removal of assets from the RAB
 - Means in which the prudency of operating expenditures is assessed.
 - Methodology to be used in design of efficiency incentive mechanisms
 - Calculation of the allowed rate of return
 - The spreadsheet to be used in calculation of the maximum annual revenue allowance.

The price application: propose or submit

- The level of regulatory discretion relating to a price application is partly determined by the process under which the decision is made. i.e.
 - Utility proposes and regulator responds; or
 - Utility submits and regulator determines.

Under the propose-respond approach

- The utility lodges a detailed price proposal with the regulator prepared so as to comply with relevant legislation, guidelines, codes, or rules.
 Eg:
 - The rules might prescribe the methodology in which the proposal is to be based, and any number of related conditions normally associated with a price application.
 - The regulated firm might be allowed to select or develop mechanisms that suit its capacity and appetite to manage risk; and
 - Select various regulatory parameters such as the duration of the control period, pass though items, efficiency mechanisms, etc.

If the proposal is deemed to meet relevant requirements set out in the relevant legislation, codes, guidelines or rules the regulator is obliged to respond by accepting the proposal. If the proposal does not meet the relevant requirements, then the regulator responds by setting out in writing its views as to the shortcomings in the proposal and/or what would need to be revised to be accepted.

- This approach is typically seen as lessening the regulator's use of discretion over rules in making its decision,
- Appeal of the decision is often more straight forward in that meeting the requirements of relevant rules s often a far more objective matter to decide than the merit of the regulator's determination.

The UK propose respond process

Ofgem's process for proposals



Adaptive regulatory approaches – decoupling, power purchase and fuel cost adjustment

<u>"Decoupling" of revenues</u>

- Essentially a sales adjustment mechanism to provide fixed revenue caps, rather than the more traditional price cap.
- Growing in use implemented to adapt to energy efficiency targeting / smart metering roll-out. (NB And perhaps the prolonged global economic downturn.)
 - E.g. In the US 25 states had implemented some for of decupling as of 2010.
- More complex modes designed to account for variable distribution costs.
- Allocation / incidence of cost adjusters by customer segments.

Power purchase and fuel cost adjusters

- Automatic cost adjusters are applied in addressing volatility in fuel costs.
- India is just one example of many jurisdictions that have implemented these models

State	Power Purchase Cost Adjustment	Fuel Price Adjustment	Frequency of Adjustment		
Kerala	Yes	Yes	Quarterly		
Bihar	Yes	Yes	Half Yearly		
Chhattisgarh	No	Variable Cost Adjustment	Time to Time		
Gujarat	Yes	Yes	Quarterly		
Haryana	Yes	Yes	Quarterly		
Jharkhand	Yes	Yes	Quarterly		
Andhra Pradesh	No	Yes	Quarterly		
Punjab	No	Yes	Quarterly		
Madhya Pradesh	Yes	Yes	Half Yearly		
Tripura	Yes	Yes	Time to Time		
West Bengal	Yes	Yes	Yearly		
Assam	Yes	Yes	Quarterly		
Maharashtra	Yes	Yes	Quarterly		
Orissa	Yes	Yes	Quarterly		
Uttar Pradesh	Yes	Yes	Quarterly		

Adjusting to volitile capital markets

- Regulators have had to follow global capital markets on a lengthy roller coaster ride trying to adjust to the highly volatile returns and needing to decide whether to take a short or long term perspective to allowed cost of capital.
- For the most part allowed regulatory returns have exhibited rather less variation than actual rates – albeit with considerable pressure from utilities to more closely track their short term portfolio costs and perceptions on future volatility in capital markets.
- As things currently stand regulated returns are at a two decade low (US rate cases)

US rate cases return on equity



Harmonisation of rates

 Harmonisation of regulatory approach and incentives to invest – variation in rates across Europe

Illustration of WACC components – Electricity							
	Germany	Poland	Finland		Czech Republic	France	Slovakia
	T&D	T&D	Distribution	Transmission	Distribution	T&D	T&D
Risk free rate	3.80%	5.421%	1.82%	1.82%	4.60%	4.20%	4.01%
Debt spread	0.60%	N/A	1%	1%	N/A	0.60%	N/A
Asset beta	0.32	0.40	0.4	0.4	0.350	0.33	0.3
Equity beta	0.79	0.690	0.529	0.853	N/A	0.66	N/A
Market risk premium	4.55%	4.80%	5%	5%	6.4%	4.50%	3%
Gearing (debt/debt + equity)	60%	42%	30%	60%	40%	60%	60%
Tax rate	15.82%	19%	24.5%	24.5%	19%	34.43%	20.00%
Cost of debt	3.80%	6.42%	1.82%	1.82%	4.91%	4.80%	5.13%
Cost of equity	9.05%	8.73%	3.97%	5.59%	8.05%	10.92%	6.00%
WACC	5.90% ¹	8.95% ¹	3.19%2	3.06%2	7.923% ¹	7.25% ¹	6.04%

1. Nominal rate

2. Real rate

Expanding scope of regulation - technological adoption and policy implementation.

- Regulators are becoming increasingly caught between rhetoric and reality, with consumer willingness to pay for low carbon energy sources and energy efficient technologies apparently far less than previously thought.
 - Solar feed-in programs have been over priced and over subscribed in places such as Australia, diving up retail cost of supply.
 - Network augmentations needed for connection of wind farms in the UK and Europe are substantive.
 - Standby generation supply needed for system security is becoming expensive for purchasers and risky for suppliers.
 - Politicians in the UK have recently called for rate freezes due to consumer backlash over announced tariff increases.
 - Pressures are growing on regulators to avoid increases, even when they are needed to compensate utilities for implementing mandatory policies.
 - Regulators are pondering if risks should be allocated to utilities to incentivise them to lobby for financially sustainable policies.

- Regulatory approaches are needed to be developed in addressing an expanded scope of regulation:
- As discussed previously Ofgem's revision of regulatory approach to the RIIO model was motivated by he need to incentivize efficient investment in infrastructure needed to support government policy non renewables.
- In Australia regulators are having to take part in the roll-out of smart metering technologies.
- Regulators in developing and developed economies are needing to take account of low income consumers ability to purchase electricity and unwieldiness to subsidise middle and high income households investment in energy efficient technologies coincident to many standard tariff structures.
- Utilities face new risks of stranded assets if participating in ill-conceived programs.

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