IHS ENERGY

Presentation

Main Challenges for the New Electricity Market

International approaches to the application of RAB regulation

23 September 2016

ihs.com

Christopher de Vere Walker,

Senior Director, +44 7817 588411, christopher.deverewalker@ihs.com

Four main regulatory options

Description	Type
State ownership and management of assets	**Nationalization**
State ownership with asset management sub-contracted to private sector	**Concessions**
Private ownership with cost plus regime	**Cost plus**
Private ownership with returns based regime	**Incentive RAB**

Incentive regulation

- Use when competition not feasible or will take a long time to develop: 'natural monopoly network activities'.
- Regulator aims to replicate competitive market pressures in the absence of actual competition.
- Needs to protect customers from monopolistic behavior.

while

- Encouraging operators to deliver appropriate level of service justifying a return commensurate with the investment risks.
- Success measured in terms of reducing costs, prices and energy losses while maintaining quality of service.

Incentive RAB regulation could deliver benefits to power distribution

European countries have faced a common challenge – how to replace ageing power distribution networks while ensuring that they are sufficiently flexible to meet rapidly changing future needs.

“Incentive regulation” for networks can provide electricity utilities with incentives to improve operating and investment efficiency and to ensure that consumers benefit from those gains. This can be achieved while maintaining investment required to support long-term network reliability. To do so successfully requires:

- An independent, properly resourced industry regulator.
- Customer driven performance targets including economic efficiency, quality of service and security of supply.
- Transparent benchmarking of key industry players.
- High quality standardized data collection and disclosure.
- Industry confidence in long, stable regulatory periods to deliver targets benefiting consumers, investors, and companies.

Key features of incentive based RAB regulation

Regulatory Asset Base regulation is a form of “cost plus” regulation with at least five special features:

1. The revenues are set over extended periods (generally between 4-8 years).

2. The revenues are set by a regulatory authority independent of government at a level that will enable the regulated entity to generate a return on an “asset base” (RAB).

3. RAB is set in a transparent manner, being related to the assets employed in delivering the service.

4. Allowed revenues are usually established by the regulator on the basis that “an efficient” company will be able to earn a reasonable return on the RAB.

5. Explicit incentives are focused on beating targets in specific regulatory segments (such as OPEX savings, quality of supply, network losses and new investments).

Calculating RAB: opening values

Two main options for valuation of existing assets:

1. Based on current replacement cost, depreciated for life and/or condition; or
2. Reflect price paid for overall business, adjusted for valuations of other activities (UK option)

Rate of Return: Old & New

- Customers benefit from existing assets – even if in very “poor” condition.
- An owner’s market risk (will it be paid for operating the asset?) is the same for old and new assets.
- Present international practice (apart from German municipal utilities) does not tend to differentiate between old and new assets when setting the return.
- One rate simplifies accounting and auditing. Avoids problems with incorporating refurbishment.
- The benchmark rate of return in most of Europe is considered in real terms (nominal return minus inflation), and is currently 6% to 7% pre tax per annum.
- Allowed return in Europe is based on weighted average cost of equity and debt (WACC).

Setting allowed revenues

- Distribution companies through their total allowed revenues are allowed to recover their capital costs (weighted average cost of capital 'WACC' x RAB), depreciation costs and operating expenditures.
- The "Allowed Revenue" cap is set for multi year periods and incorporates assumed efficiency improvements that would be expected from an "efficient" firm.
- In the UK model, the revenues were set for the first year then allowed to rise with inflation (Retail Price Index [RPI]) minus a percentage (X) in each of the following years of the regulatory period (called "RPI-X"). The Regulator set the X factors for each company and their starting prices for the price control period.
- If the company is more efficient than anticipated, i.e., spends less money yet delivers the required security standard, then the shareholders retain the benefit for a period thereby incentivizing the company, and vice versa.
- Consumers benefit from efficiency savings and performance targets including quality of service and security of supply.
- At the end of the period, the revenue cap is reset.

Investment planning and value creation under incentive RAB

- Extended regulatory periods (initially 5 years in UK, now 8 years in UK and Italy with four years in France) allow companies to plan their activities with some, but not complete, certainty. This is a critical advantage compared to cost plus regulation especially for a capital intensive industry with long investment cycles such as electricity distribution.

- Resetting of the revenue cap allows customers to benefit from the efficiency savings but, at the same time, may weaken the company's incentive to economize. The longer the regulatory period, the stronger the incentive on the company to be efficient.

- This form of regulation allows a company to create value, in excess of the allowed return by 'beating the regulator's expectations' and led to early problems in the UK. However, as regulators become more informed, the 'gaming benefits' do not last beyond one or two regulatory periods as transparent and testing industry cost and service benchmarks are established.

Evolving RAB: 'TOTEX' – a performance-led form of cost recognition

Avoiding CAPEX bias is increasingly important with the rise of 'active network needs':

- The knowledge that the Regulator will allow a company to earn a return on investment often leads companies to favor solutions that involve the construction of new assets, rather than using alternatives.
- RAB incentivized companies have tended to favor "CAPEX" solutions to operational expenditure (OPEX).
- Italy and UK started using a "TOTEX" methodology in 2015. All CAPEX is added to the RAB and ~ 70% of all OPEX, excluding business support and corporate services, is also added to the RAB. These items are depreciated over 15 years.
- This "indifference" to OPEX and CAPEX essential if embedded generation, and "smart grids" to be deployed at lowest cost to customers.

Depreciation

Capex

In Europe, capex plans are usually determined by the companies' assessments of the future needs of the business (as opposed to the arithmetic depreciation of assets).

New Assets

In the UK, new assets were initially depreciated over 33 years for calculating the Regulated Asset Base and revenues. Their amortisation was reduced to 20 years in order to avoid this "cliff face" and the difference spread over 15 years.

Existing assets

In the UK, amortisation period ranging from 11 to 15 years was assumed by the Regulator but this would have led to a sharp reduction in the depreciation allowance in the allowed revenue. The amortisation of new assets was adjusted (see above under "new assets").

Connections

- **Connections treated as an "excluded service."** It may be necessary to take the revenues, costs and assets associated with some customers outside the revenue cap and the regulated asset base (as in the UK where it is under 10% of GWh delivered).
- **Customer who make or have made a contribution for all or part of the costs of the connection itself.** In these cases, the associated assets are excluded from the RAB in European jurisdictions and the customer only charged for relevant operations and maintenance.

Embedded generation

- Distributed generation may impose additional reinforcement costs on a network – as well as potentially remove the need for reinforcement.
- If embedded generation is to be encouraged, as in the UK and Italy, then "shallow" charging is appropriate. This spreads the cost of reinforcements over all users.
- A "deep connection" would require the new generator to pay for all necessary work.

Incentive RAB in practice

European, especially British experience, shows incentive based (RAB) regulation could deliver benefits for Ukraine's evolving electricity distribution network and customers. The UK experience is the most instructive because:

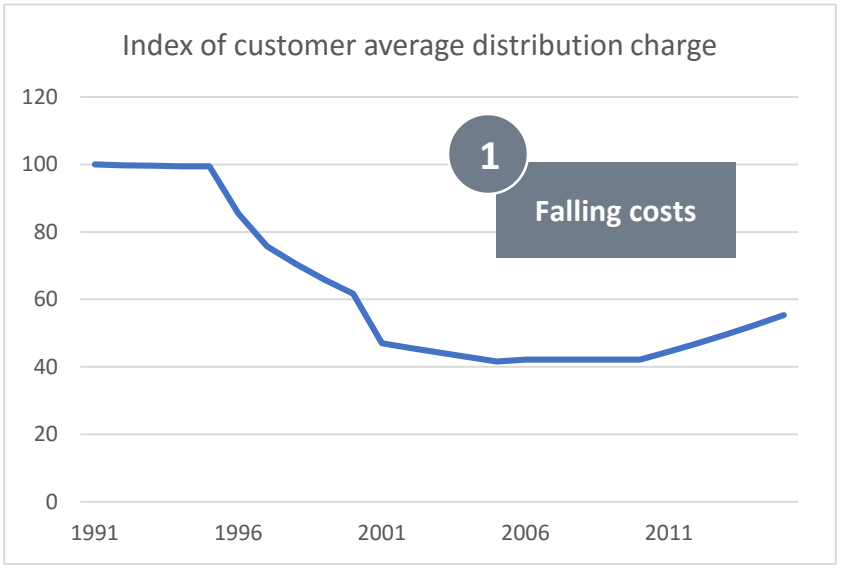
- Longest established RAB incentive system (21 years).
- Transparent and flexible
- Based upon customer driven performance targets
- High quality standardized data collection and disclosure
- Industry confidence in long, stable regulatory periods

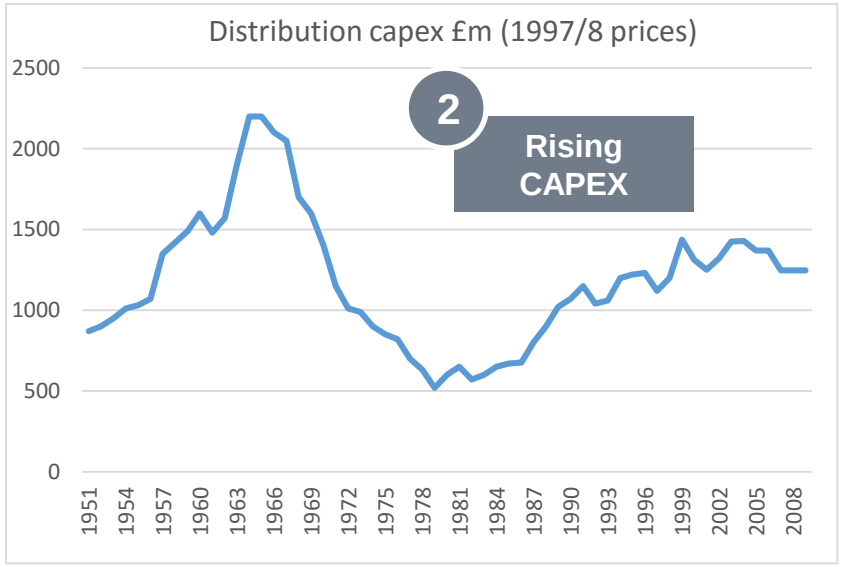
Essentially

- Delivered lower distribution charges to all customers from 1995 onwards while ensuring sufficient network investment.

A well delivered RAB methodology can bring long run significant economic benefits to consumers, while ensuring appropriate capital investment and robust security of supply in absolute terms

Despite rises in capex distribution charges fell by over 40%





Source: Ofgem, "Exceptional" events are defined with reference to storm conditions

High level lessons learnt from evolution of UK RAB

GB experience over 21 years shows that:

- Great Britain's 1995 re-setting of cost targets (that even then proved inaccurate) showed that insufficient time and resources had been devoted to cost data underpinning performance targets.
- Regulator must be genuinely independent, properly resourced with a clear understanding of what is required to deliver performance.
- Companies will also need time to build confidence in the independence of the regulator and longevity of the regulatory periods.
- Realistic and mutually beneficial customer driven performance targets.
- Time and resources must be committed to standardizing accounting treatments, identifying key metrics and developing systematic data acquisition processes.
- The 1998, £1.5 billion windfall profits tax represented an unnecessary political intervention and regulatory failure.
- Innovation difficult with "incentive" regulation. Regulator may reset costs at next review. This dampens speculative innovation. UK introduced "Innovation Fund."

Conclusions

- Incentive regulation of networks can provide electricity utilities with incentives to improve operating and investment efficiency.
- This can be achieved while maintaining investment required to support long-term network reliability.
- Britain's incentive RAB flexible and transparent replicates the effects of competition in a natural monopoly network business.
- This can be achieved because incentive RAB encourages a productive negotiation between the regulator and companies.