

Getting Ready for New Network Regulation

From Input Based Regulation to Individual Regulatory Objectives and Performance Evaluation



The European energy sector is facing significant changes which require regulatory authorities to adopt innovative approaches based on individualized regulatory methodologies. To remain profitable and succeed in this new environment the utilities sector must become more proactive and adopt a new approach to regulatory management.

Historical development of energy sector price regulation in Europe

Energy sector price regulation developed along with the liberalization of the industry. The European Union legislation that led to the unbundling of distribution and transmission activities and therefore to the scope of price regulation (which had historically included the entire value chain), was narrowed to the tariffs of distribution and transmission network operators only. Initially, network price regulation was based on Cost Plus and Rate of Return methodologies and Network operator profit was set to allow for operating expenses, or as a percentage of the value of (long term) assets. This indirectly motivated companies to increase investment in their networks, without sufficient attention for their efficiency, or to increase costs in order to maximize profit. The internal inefficiencies caused by these factors, also known as the Averch-Johnson effect, were the main reason behind replacing the initial methodologies by alternative and more advanced regulatory principles.

One such methodology, which shaped the overall direction of energy sector regulation in Europe, was RPI-X. This was developed in order to improve the efficiency of regulated companies and is based on setting a long term cap on allowed prices (Price-Cap) or revenues (Revenue-Cap). These caps are adjusted annually to account for inflation (RPI – Retail Price Index) and are further adjusted by the efficiency improvement required by the regulator, expressed as the efficiency X factor. The regulator sets the X factor based on efficiency analysis (benchmarking) of the regulated companies. Therefore regulated companies are motivated to decrease costs below a set level, as the difference between actual cost and allowed regulated cost

represents additional profit during the regulatory period. This methodology, first introduced in the UK in the early nineties, quickly spread throughout Europe, thanks to its relatively simple implementation and ability to achieve efficiency improvement. Today, it represents one of the most widely used regulatory methodologies.

Impact of new regulatory methodologies in relation to new challenges in the regulated industry

The primary objective of the RPI-X methodology was the reduction of network operator inefficiencies. However, due to the continuing development of the European energy sector and EU policy priorities, new challenges for national regulators and regulated companies have emerged. Current challenges for European energy policy include the following areas:

- Development of an integrated European energy market
- Focus on security of supply and its diversification
- Increasing share of renewable energy sources and the need to integrate these into the network
- Increasing customer requirements on quality and reliability of supply
- Development of new technologies and the need to increase R&D costs.

As the RPI-X methodology was developed at a time when the energy sector faced significantly different issues, the application of RPI-X in its basic form no longer results in the same effect. The methodology is based on setting allowed costs based on

past results and therefore cannot take into account the costs of new activities and regulatory demands stemming from market transformation (e.g. supplier change costs) or from stricter rules for operation (mainly loss of synergies due to unbundling). The information asymmetry between the regulator and regulated companies may also result in an inefficient allocation of the costs and investments included in the regulatory formula. This is because the regulator implicitly prescribes such allocation through regulated parameter setting without necessarily having the entire set of inputs for such decisions.

The pressure on efficiency and a reward system based on continuous cost reduction have also reached their limits. Regulated companies are unable to reduce costs at a rate to match profit decline, which causes investments to be less profitable. As a result of these lower returns on capital and increased risks, the entire industry has become less attractive for investors. The limits of allowed cost reduction can be illustrated by electricity distribution in the UK, where regulated revenues fell by more than 50% from the introduction of RPI-X, within four regulatory periods. Of those 50%, more than 90% of savings occurred within the first two periods and real costs have remained flat thereafter.

energy policy. The tools used to re-start a much needed inflow of investment into the regulated energy sector differ, but they share a common approach, which is a focus on the regulation of outputs. This is based on an adjustment of the original RPI-X formula, through the addition of components based on outputs, related to the achievement of set objectives.

The best example of regulated output is the quality of supply, monitored using indicators of continuity of supply (SAIDI and SAIFI¹). However, a regulation of supply quality is only the beginning as the core idea is the link between regulatory policy and the determination of regulated prices for a specific network operator.

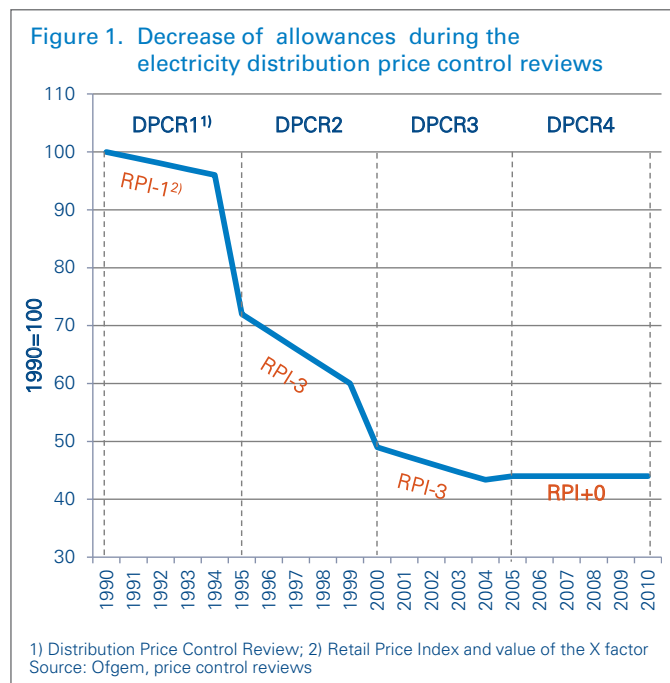
This leads to an individualization and adjustment of regulation based on specific market needs, or objectives set by the regulator. Regulated companies are more involved in energy sector development and if set objectives are met, they are rewarded through the regulatory formula.

One of the pioneers in the use of output based regulation is the United Kingdom, which re-invigorated incentive based regulation by introducing a brand new transmission tariff methodology, RIIO, in 2013. The deployment of this methodology is to be followed for DSOs in 2015. The most obvious example of a regulatory objective is the improvement of security of supply, where the regulator monitors investments into the network and physical conditions of transmission assets. However many different forms of output incentives can be applied, especially for distribution network operators.

A further interesting example of the use of an output based regulatory framework is in Poland, where smart meter implementation was decided based on a national cost-benefit study. Through the regulatory framework, companies are motivated to invest in smart metering technologies through rewards in the allowed revenues set. These are based on an evaluation of specific positive outcomes in physical metering cost reduction and in balancing energy savings.

Customer service quality improvement requirements are also part of the regulatory framework in Ireland, where the speed and quality of provided information serves as the basis for a system of bonuses/penalties, with an impact on overall allowed revenues.

Another example of output based regulation is from Italy, where investments in Smart Grids and "energy storage" are supported through an increased WACC value. Investments in specific projects are also supported through an increased WACC in Portugal and Luxembourg.









New approaches to natural monopoly price regulation

National regulators are seeking to address current European energy challenges by implementing innovative incentive regulation schemes. These schemes aim to make the regulated industry more attractive for investors, which will in turn produce further growth and achieve the ambitious goals of European

1. SAIDI (System Average Interruption Duration Index; SAIFI (System Average Interruption Frequency Index)

Figure 2. Examples of the output based regulation

		<i>Selection of objectives and outputs</i>	
Country	Objective of the regulation	Regulated outputs	Incentive
UK 	Increase TSO network safety	<ul style="list-style-type: none"> Volume of asset replacement Asset health, condition and criticality 	Reward / Penalty system – up to 2.5% of the value of any over/under delivery of network replacement outputs
Poland 	Deploy automatic metering infrastructure and smart metering devices by the 2020 and decrease electricity balancing differences and reduce cost for meter readings	<ul style="list-style-type: none"> Volume of investment into smart metering Decrease of balancing energy Reduction of metering costs 	Bonus system - increase WACC based on the delivered outputs up to 7 % but maximally 2% of allowed revenues
Ireland 	Improve quality of the service provided to customer by DSO customer call center	<ul style="list-style-type: none"> Speed of telephone response Call abandonment rate Customer call-back survey Mystery caller survey 	Reward / Penalty system – asymmetric incentive in the range of + 0,25% / - 1% of the allowed revenues
Italy 	Support investment into smart grids and energy storage system pilot projects	<ul style="list-style-type: none"> Volume of investment into smart grid projects and energy storage 	Bonus system – increase of WACC by 2 % for 12 years
Portugal 	Support innovative investment that should result in greater process automation and better allocation of resources and decrease operational expenditures	<ul style="list-style-type: none"> Volume of innovative investment 	Bonus system - increase WACC of 1,5 % and simultaneous increase of X factor by 0,1% for 2 years
Luxemburg 	Interconnect electricity transport networks, increase security of supply and achieve timely notification of final investment decision to the regulator	<ul style="list-style-type: none"> Volume of cross-border investment Timely notification of the investment decision 	Bonus system - increase WACC up to 0,60% for 10 years

Source: Arthur D. Little

Future development and its implications for regulated companies

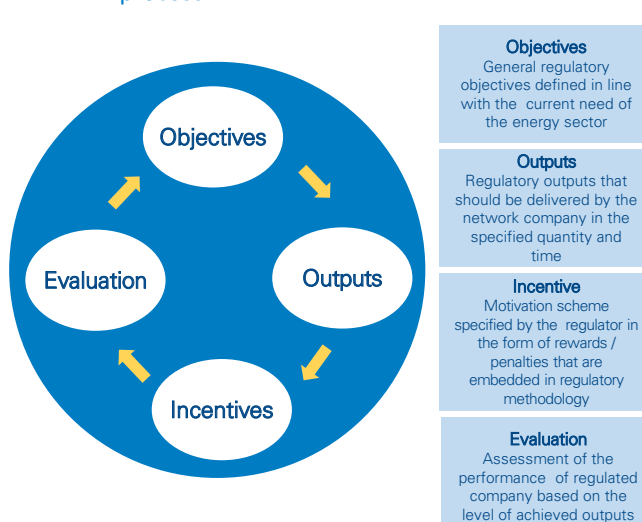
The above European examples illustrate how national regulators try to motivate regulated companies to achieve regulatory objectives by using special bonuses. Contrary to the efforts of the European policy makers, national regulatory frameworks are diverging in order to tackle unwanted effects of the European energy sector development such as lack of investments or increase of the regulated energy prices. As a consequence, the most regulated players in the energy landscape (grids) have a setup deviating not only from country to country but also among the regulated players on the national level. This is because the bonuses are usually set for companies individually, based on achieved results. Individualized regulation focused on outputs can therefore be seen as a next level of regulatory framework development and it is expected that implementation of individualised incentives will also follow in other European countries.

The key question for regulated companies, and the key area in which ADL has been providing advice to its own clients, is how this development will influence their future profitability and how it should impact their current business model.

In ADL's experience, the answer to these questions are not simple, as individualized price regulation parameters are by nature defined with the specific circumstances of each regulated company and their regional market space in mind and depend on the evaluation of these circumstances by the regulator. Furthermore, these parameters are often set through bilateral negotiations between the regulator and the regulated party,

requiring the development of increasingly complex negotiating briefs.. It is our view that the role of the regulated company in setting regulatory parameters is likely to increase significantly as we find that the relationship between the regulator and the regulated company is therefore moving towards a partnership between the private and public sector.

Figure 4. Illustration of the output based regulation process



Source: Arthur D. Little

The process by which we at Arthur D. Little have supported our clients in this area, leading to a setup of output incentive based regulation can therefore be described in four basic steps:

1. The first step is deciding regulatory objectives, which are linked to national energy policy.

2. Each of the objectives is then assigned measurable outputs, linked to regulatory parameters.
3. Along with the parameters, target values are defined, to allow for regulated price calculation through a system of rewards/penalties.
4. The final step is a regular reporting of target values and inputs for adjustment of the regulatory objectives.

Key takeaways for market actors and investors

From the point of view of regulated companies, the current developments in regulatory approach represent a clear shift towards the regulation of outputs. Such developments in regulatory policies will also cause an inflow of new funds into the regulated sector and represent an opportunity to boost the regulated business, which will of course differ country by country based on the national priorities or issues and the specific set up of regulatory methodology. Companies which first master these new rules of the game, whether by pursuit of initiatives such as Smart metering, Enhanced customer services or Environmental protection, will benefit most from this new regulatory paradigm.

The regulatory management advice that Arthur D. Little provides its clients has helped them to benefit from the changing regulatory environment, strengthening margins by delivering results in the following areas:

- Increased focus on regulatory relations while deploying an appropriate communications strategy
- More active participation in shaping future regulatory mechanisms
- Keeping regulatory strategy up-to-date and aligned with the regulator's targets and policies
- Identifying and managing the right stakeholders within the output based regulation process
- Understanding and integrating the implications of new incentive measures, within the existing framework, on current business models and activities
- Rapid adaptation of the organization to meet new targets and challenges.

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Arthur D. Little

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