Mapping power and utilities regulation in Europe

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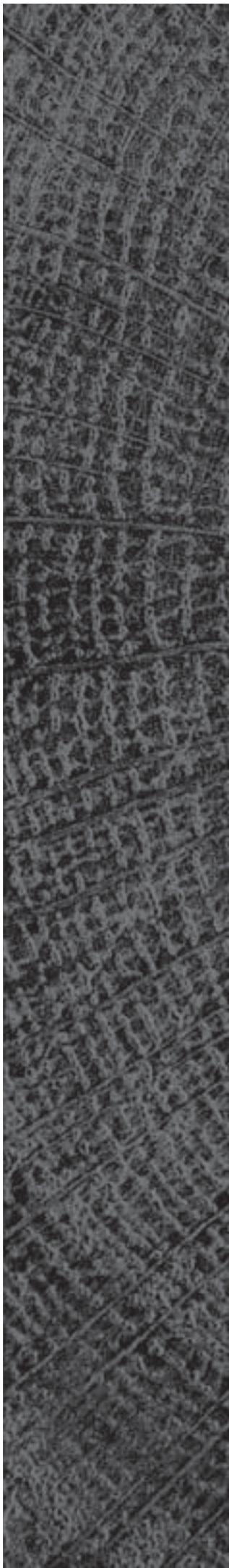

Introduction

Power and gas regulation in Europe is highly complex. No two countries are regulated in quite the same way – although all regulators are getting more demanding. In our daily work with power and utility clients, we see what a struggle it can be to understand the whole picture.

Diverse styles of regulation are not the only problem. The lack of stability in national regimes – which often results from political interference – causes constant change. This can seriously disrupt long-term strategic planning, daily operations, investment planning and investor relationships.

For example, lack of clear understanding of overseas regulation can lead utilities to make ill-advised investments in foreign markets – where they lose money running a business and lose even more when they inevitably decide to exit.

Meanwhile, system operators on either end of an international transmission link can find themselves incentivized to do quite different things by their regulators, even though they are increasingly physically connected.

It's, therefore, not surprising that compliance and regulation emerged as the number one risk for power and utility businesses in EY's *Business Pulse 2013* report.

National power and gas regulators are increasingly looking for good benchmarking information and ideas for improving efficiency and reducing costs to customers. But information is hard to compile.

There is little published material that maps the whole landscape of power and gas regulation in Europe, helps utilities to weight regulatory risks and allows regulators to take a broad international view. This report – the first of its kind – aims to create a clearer picture and provide a useful international benchmark tool, to allow CFOs, local country management, transactions teams and regulators to compare and contrast approaches.

We have surveyed the regulation of gas and electricity distribution and transmission in 16 countries.[1] This paper provides an analysis of key trends, similarities and differences across the region, supplemented by detailed information on the key features in each country.

For more information, please talk to your usual EY contact. Alternatively, please get in touch with me or our national contributors, listed on page 25.

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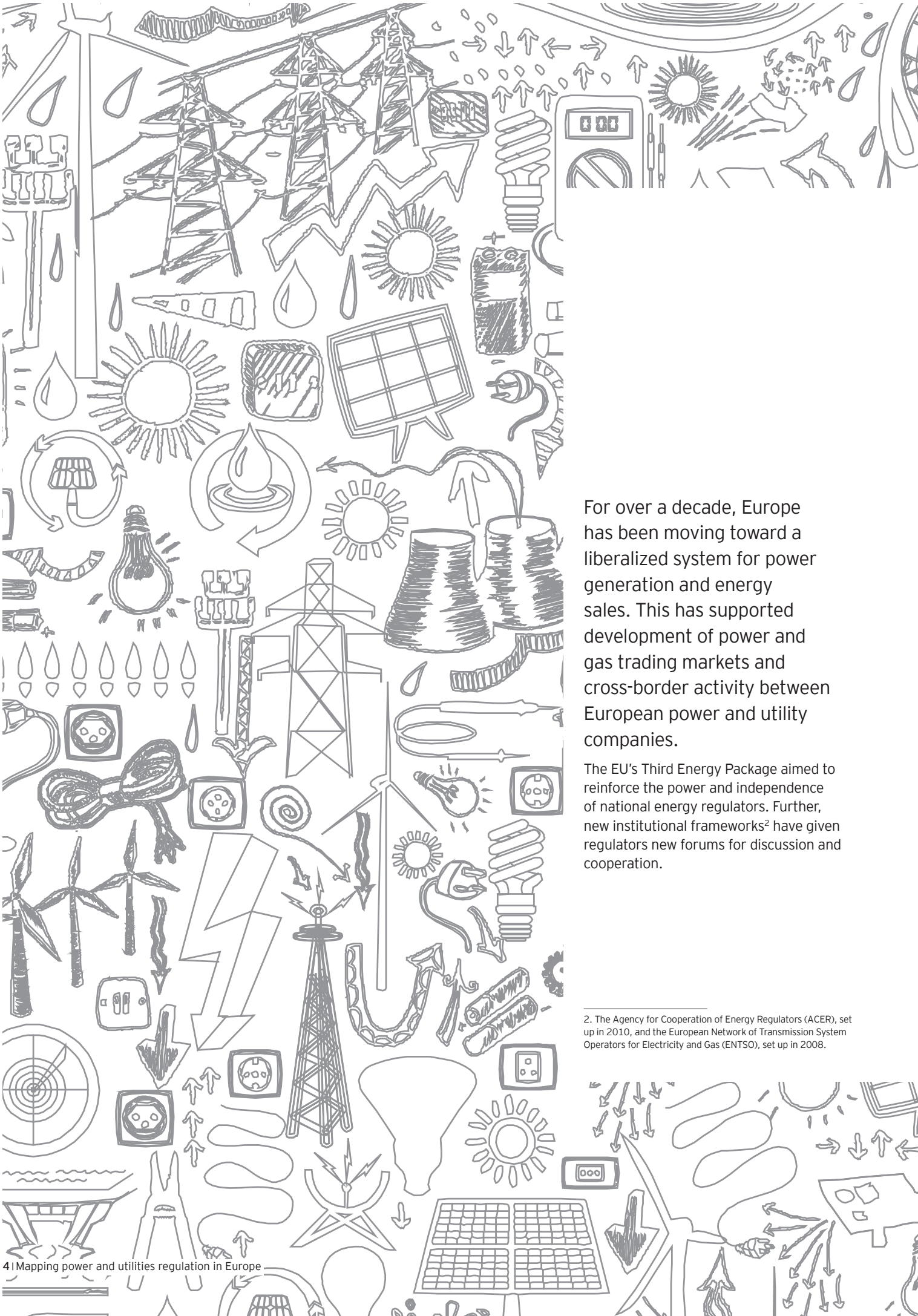
1. Belgium, Czech Republic, Finland, France, Germany, Greece, Italy, the Netherlands, Poland, Romania, Slovakia, Spain, Sweden, Switzerland, Turkey, the United Kingdom.



For over a decade, Europe has been moving toward a liberalized system for power generation and energy sales. This has supported development of power and gas trading markets and cross-border activity between European power and utility companies.

The EU's Third Energy Package aimed to reinforce the power and independence of national energy regulators. Further, new institutional frameworks[2] have given regulators new forums for discussion and cooperation.

2. The Agency for Cooperation of Energy Regulators (ACER), set up in 2010, and the European Network of Transmission System Operators for Electricity and Gas (ENTSO), set up in 2008.

Executive summary

While these moves reinforce communication between national power and gas regulators, we're unlikely to see Europe operating under a single regulatory system in the short term. A variety of models will continue to coexist for the foreseeable future (see page 6). Understanding Europe's power and gas regulation rules will continue to be complex and extremely challenging.

It isn't just the overall approach that varies by country: the definition of what we might assume to be common parameters – the cost of equity and debt gearing, for example – can also be distinctly different depending on your location. Even when regulators are using the same kind of input categories, the level of input itself can vary widely, and in ways we might not expect (see page 12).

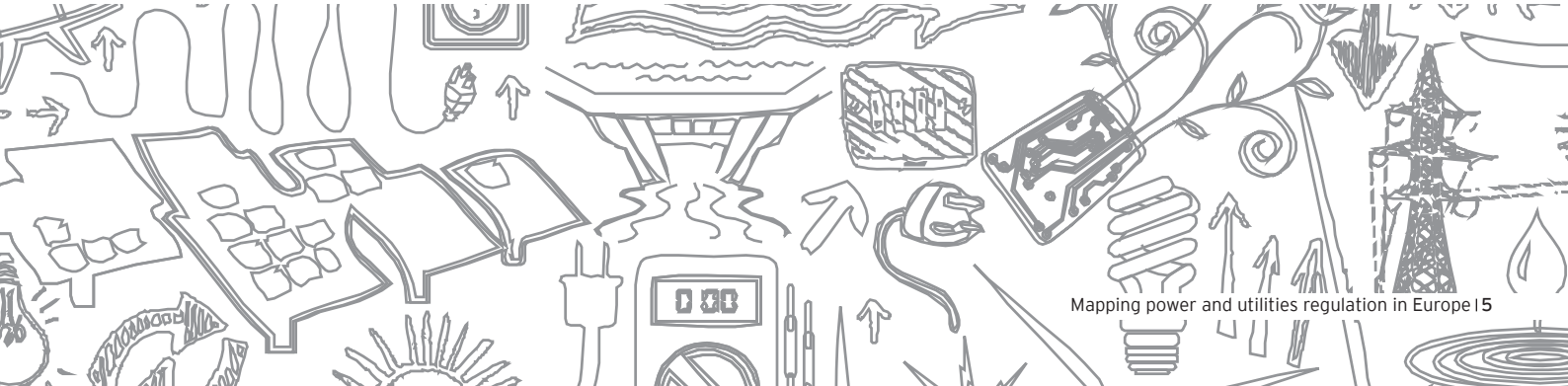
There are some common trends, including a widespread downward pressure on rates of return (see page 16). This is partly because – apart from a few countries affected by the debt crisis – the cost of debt has generally come down. Some national regulators also clearly believe regulated returns should be reduced because the risks of operating a regulated activity are lower now. Others appear to believe that operators have been earning too much.

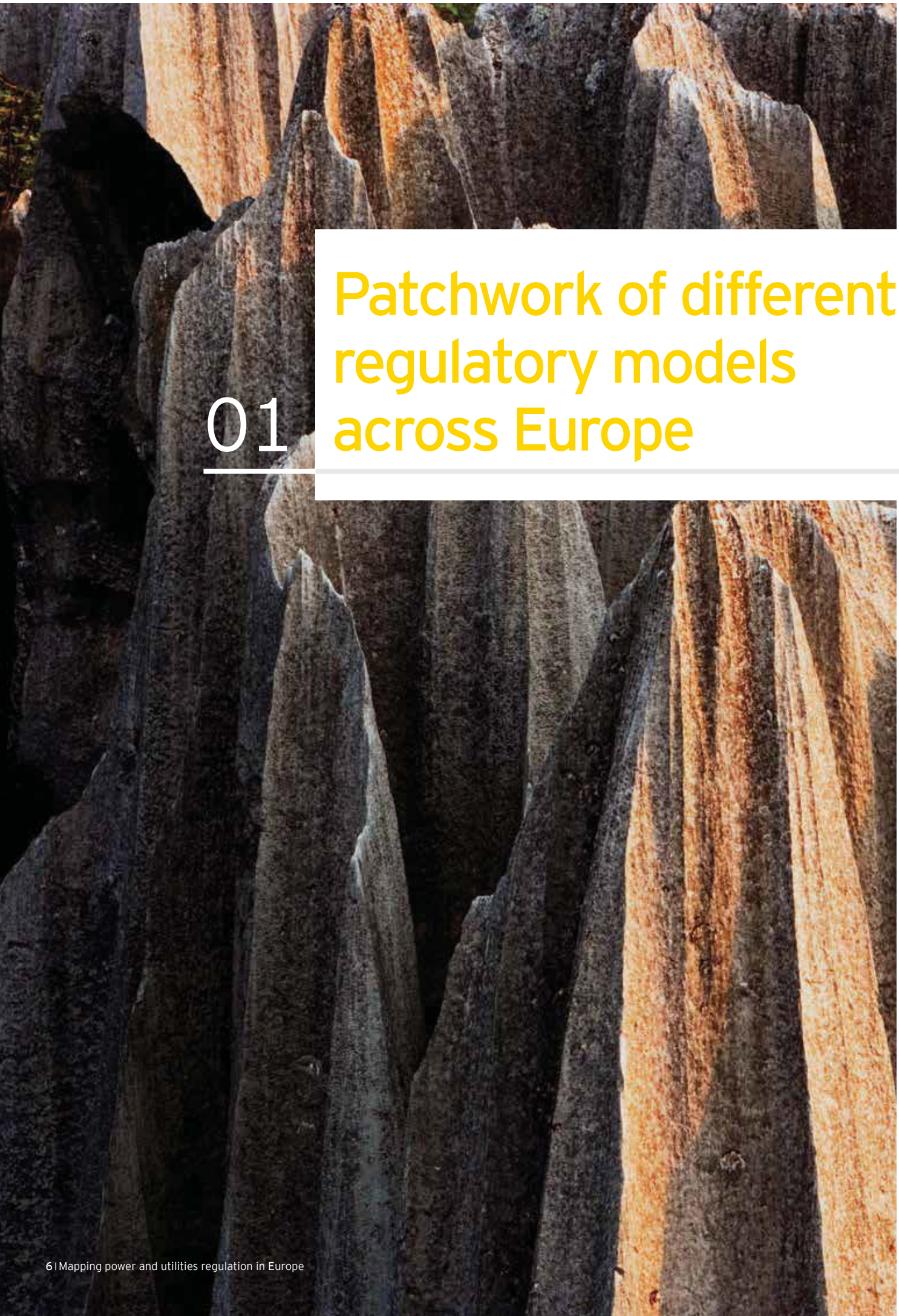
Regulators are sharing and comparing the components of their regulatory structure in ways that couldn't have happened even 5 to 10 years ago, seeking to understand each other's methods and decisions. As a consequence, their objectives and methods have increasingly converged, with a general move toward incentive-based regulation and widespread interest in regulating for better efficiency, economic performance and quality of service (see page 18).

The European Commission is likely to continue to push for greater consistency in regulatory regimes. But rising energy costs are politically controversial for all national governments, and the trend toward greater convergence may well be countered by government interference with regulatory decisions (see page 24). This may inject further instability and an even greater degree of risk for those operating internationally.

"Two main trends are at work: regulators are demanding more and more efficiency, and they are pushing for fair prices, putting pressure on returns."

Louis-Mathieu Perrin, EY





01 Patchwork of different regulatory models across Europe

Around Europe today, the dominant approach to regulation in this sector (largely replacing the "cost-plus" approach) is one that takes the regulatory asset base (RAB) as its underlying structure.[3] Below we provide a brief summary of how RAB systems work.

However, the picture around Europe is highly nuanced. We have grouped power and gas regulation into four main types across the 16 countries that we surveyed (see Figure 1):

- Cost plus: Belgium
- Incentive-based: Czech Republic, France, Germany, the Netherlands
- Revenue/price/income cap: Poland, Romania, Slovakia, Sweden, Turkey
- Combination of models: Finland, Greece, Italy, Spain, Switzerland, the UK

The RAB-based structure is not used in all the countries under consideration. And even if you are familiar with how RAB works in your home territory, you will not necessarily appreciate how it is applied abroad.

To demonstrate the wide variety in methodology, we have highlighted three specific examples – from Germany, Finland and Spain – that show unique national twists on pages 9 to 11.

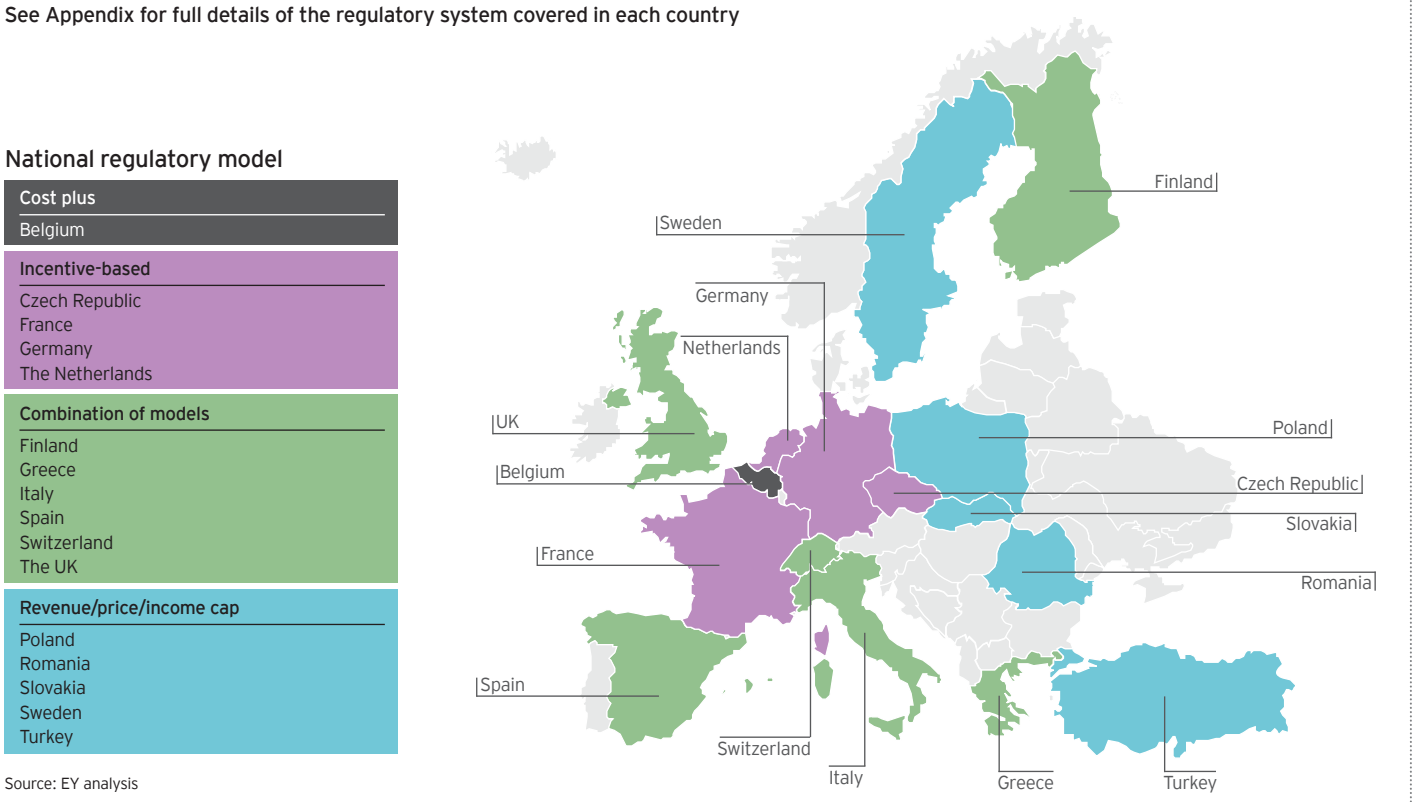
Regulatory asset base: quick reminder

Straight "cost-plus" regulation used to be widespread in Europe. Regulators paid power and gas companies based on their costs, plus a return to compensate for their activity. But today only a very limited number of countries allow distribution and transmission system operators to automatically pass through costs in their tariffs.

RAB-based regulation aims to give operators a fair return on their investment in the business.

Figure 1. Mapping selected power and utilities regulation in Europe

See Appendix for full details of the regulatory system covered in each country



Source: EY analysis

3. Sometimes also referred to as "regulatory asset value" (RAV). Please note that RAB is a generic definition and therefore does not appear in Figure 1. In fact, RAB can be used as a reference or building block in any of the four regulatory types we identified.

The most common regulatory structures are now RAB-based: they approximate how much money a company has invested and pay it a return on that investment. Various countries have adapted this RAB structure in different ways: the "incentive-based" and "revenue cap" models are largely based on RAB.

We can summarize a RAB-based structure with the simplified formula shown in Figure 2.

How the RAB-based revenue cap model works in Poland

Poland provides a useful illustration of how a revenue cap model, based on a RAB concept, is currently structured. Figure 3 shows the revenue calculation method applied to Polish electricity distribution system operators (DSOs) in the current regulatory period (2012 to 2015).

Figure 2. RAB-based regulatory formula – typical revenue cap model

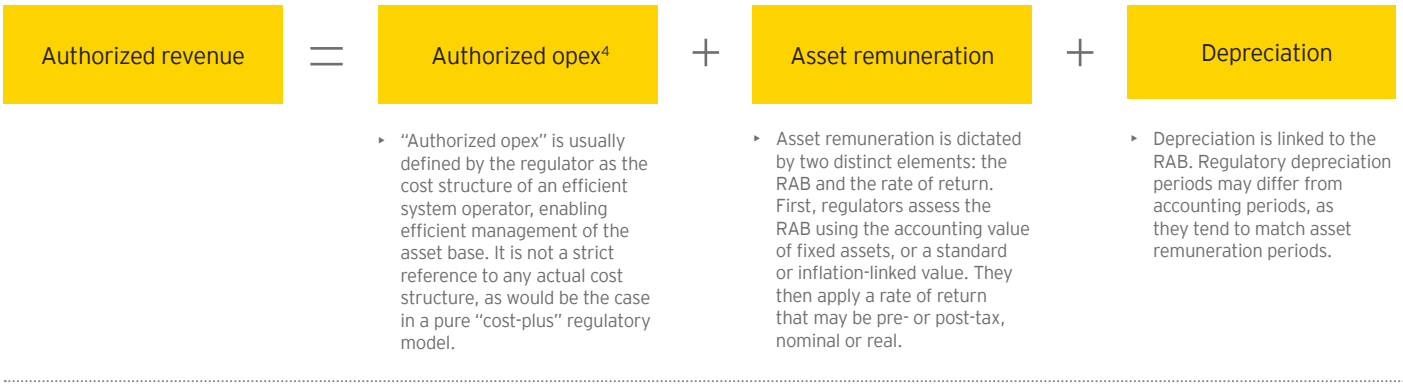
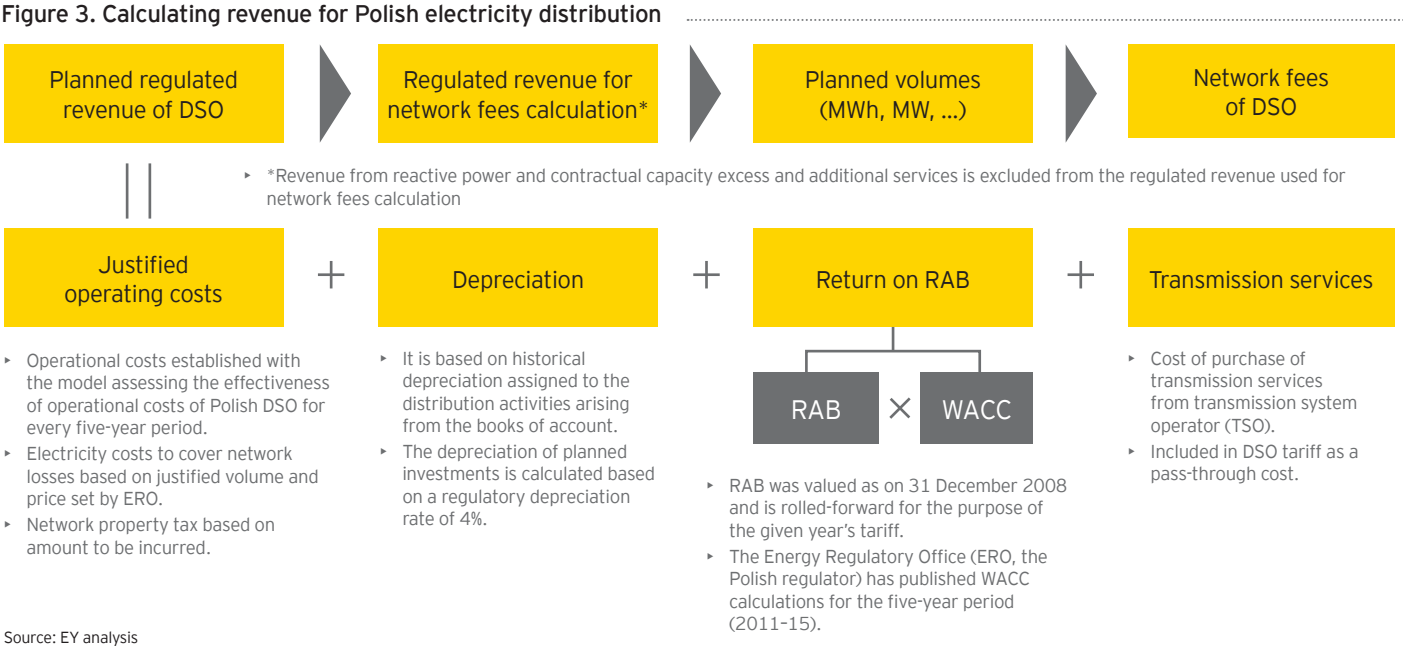


Figure 3. Calculating revenue for Polish electricity distribution



Source: EY analysis

4. Operating expenditure.

The German regulatory model focuses on driving costs down by benchmarking similar operators against each other.

The different elements that feed into this calculation – authorized opex, asset remuneration and depreciation – vary widely in different locations. The summaries in the Appendix (page 26) provide an overview of these local differences, focusing on the key elements of each national regulatory model.

Examples of highly diverse approaches: Germany, Finland and Spain

Alongside RAB-based structures (which we can view as the "standard" or "reference" structures), a number of other regulatory structures are in use across Europe that set a form of revenue cap for operators. Each local regulatory system has its own specific qualities and oddities. Overleaf, we highlight examples in Germany, Finland and Spain, which all have particularly strong characteristics.

These examples and the other regulatory structures detailed in the Appendix (page 26) demonstrate the variety that continues to coexist in Europe, with each national regulator pursuing efficiency and adequate cost benefits in its own unique way.

Germany: benchmarking model based on costs

Germany's model (see Figure 4) sets authorized revenue in the form of a revenue cap. This is the sum of three types of cost: "inefficient," "efficient" and "non-influenceable," which the regulator assesses by benchmarking operators sharing the same characteristics against one another.

There is no formal reference to the RAB concept.

"Inefficient costs" describes a situation where a company is providing a more expensive service than its peers, in terms of costs that it can control or influence. Inefficient costs are determined at an individual company level, based on a benchmarking exercise with other operators that have similar characteristics. The regulator has set German operators a target to fully eliminate inefficient costs at the end of the second regulatory period (2014 to 2018).

"Efficient costs" are also determined based on a benchmarking exercise. They are defined as the influenceable costs of the benchmark company in a reference year. They are subject to a cost reduction target.

"Non-influenceable" costs – such as employee benefit costs and transport grid fees for distribution companies – are fully reimbursed by the regulator. They are not subject to any incentive mechanism.

To take new investments into account, annual allowed revenue is adjusted through an expansion factor. This factor depends partly on the number of new connections to the grid for distribution operators (which is given a 50% weighting) and partly on the size of the service area (also 50% weighted).

By separating three types of cost, the regulator aims to encourage cost reduction – both at individual company level and across the whole group governed by the common regulatory regime.

Figure 4. German regulatory model

$$R_t = c_{ni,t} + \left[C_{iB,0} + (1 - V_t) \times C_{i,0}\right] \times \left(\frac{CPI_{t-2}}{CPI_0} - XF_t\right) \times EF_t + Q_t$$

Where:

- R_t = Allowed revenue in the year t
- $C_{ni,t}$ = Costs that cannot be influenced, e.g., employee benefit costs and grid fees for higher voltage levels (e.g., transport grid fees), applicable for year t
- $C_{iB,0}$ = Influenceable costs of the benchmark company in the reference year
- V_t = Percentage of inefficiency that has to be reduced by the end of year t
- C_i = Costs that are caused by inefficiency of the individual company
- CPI = Consumer price index
- XF = General X-factor, based on 1.25% in the first regulatory period:
  - XF_{2009} = 0.0125 = 1.25%
  - XF_{2010} = 1.0125 × 1.0125 – 1 = 0.025 = 2.52%
- EF = Expansion factor; dependent on the number of connections to grid (50%) and on the size of the service area (50%)
- Q = Quality component (not yet implemented)
- t = index running from 1 to 5 (basis 0 is reference year)

Source: EY analysis

The Finnish model compares achieved performance with a "standard" return.

The regulator wants to ensure companies don't sacrifice quality to make more profit.

Finland: unique, highly sophisticated model

The Finnish model applies to both electricity distribution system operators and transmission system operators under the current regulatory period (2012 to 2015). It aims to cap profits at a level corresponding to the allowed return on investment (currently 3.19% real for the DSO and 3.06% real for the transmission system operator, or TSO).

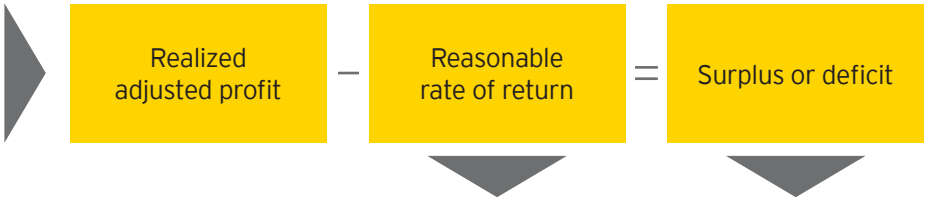
The regulator – the Energy Market Authority (EMA) – uses the following method:

- The regulator adds together the "realized adjusted profit" for different years in the regulatory period (see Figure 5) and deducts the sum of "reasonable return" for the corresponding years. To calculate the realized adjusted profit, the regulator starts with the accounting profit. This is revised to a) take into account all the costs not recognized from a regulatory perspective and b) add all the incentive and efficiency mechanisms embedded in the regulatory structure.
- The result is surplus or deficit.
- After the regulatory period, the four-year total surplus/deficit is calculated by adding up the yearly surpluses/deficits. Both electricity distribution and transmission system operators are bound to compensate the surplus and allowed to compensate the deficit in their price setting in the following regulatory period.

This method maintains a direct link between companies' financial, accounting and regulatory performance, and it enables regulated companies to capitalize on the benefit of regulatory incentives and bear the cost of regulatory underperformance.

Figure 5. The Finnish model for electricity DSOs and TSOs

- Transmission system operator formula:
- Operating profit (loss)
  - + Accounting items returned to operating profit (loss)
  - + Annual net change in the accrued refundable connection charges entered in the balance sheet
  - + Paid network rents
  - + Planned depreciation on goodwill
- - Investment incentive
  - + Straight-line depreciations calculated from the replacement value of the network
  - - Planned depreciations on the electricity network
- - *Quality incentive*
  - + Reference level of outage costs
  - - Actual outage costs
- - *Efficiency incentive*
- - *Innovation incentive*
  - + Reasonable costs of R&D activities
- = Adjusted operating profit (loss)
  - + Other adjustments
  - - Costs arising from financial assets required to safeguard network operations
  - +/- Net hedging costs
- = Profit before taxes
  - - Imputed corporation tax of a system operator subject to corporation tax
- *= Realized adjusted profit*



- Reasonable rate of return (acceptable rate) is determined each year for the adjusted capital invested (=equity and interest-bearing debt) in network operations.
- Considered in the prices in future

Source: EY analysis

Spain: reference network model for power distribution companies

In the regulatory period from 2009 to 2012, remuneration for distribution activities in Spain was calculated using a reference network model as a technical comparison tool.

Spain uses different regulatory systems for gas and electricity, distribution and transport.

For power distribution, remuneration is based on a reference network model — a highly customized method.

The reference network model maps out the areas in Spain where each distributor is active. It determines the reference distribution network needed to link up the transmission network (where applicable) and distribution network with the end consumers of electricity, based on their location, feed voltage and demand for power and electricity.

The reference remuneration of each distribution company is calculated by adding three components (see Figure 6):

- Remuneration for investment
- Remuneration for operating and maintenance
- Remuneration for all other costs necessary in distribution activities (i.e., commercial management, network planning and energy management costs)

This form of revenue cap aims to push operators to optimize levels of network operation and management. There is no formal reference to RAB.

Figure 6. Spanish power distribution — summary remuneration formula

$$R^i_0 = R^i_{base} * \left(1 + IA_0\right)$$

Where:

- R^i_{base}: reference remuneration level for the company "i," established by the Ministry of Industry, Energy and Tourism
- R^i_0: reference remuneration level for the company "i," updated to the year when the calculations are made

$$R^i_0 = R^i_0 \cdot \left(1 + IA_1\right) + Y^i_0 + Q^i_0 + P^i_0$$

- R^i_n: recognized remuneration for the distribution activity to the distribution company "i" in the year "n" of the regulatory period
- Q^i_{n-1}: incentive or penalty for the service quality for the distribution company "i" in the year "n" related to the degree of compliance during the year "n-1" for the goals established for the service quality indices
- P^i_{n-1}: incentive or penalty for the losses reduction for the distribution company "i" in the year "n" related to the degree of compliance of the goals established during the year "n-1"
- IA_n: index to update the calculations to the year "n" according to the following formula:

$$IA_n = 0.2 \cdot \left(CPI_n - 1 - x\right) + 0.8 \cdot \left(IPI_n - 1 - y\right)$$

- Where x=80 basic points and y=40 basic points for the regulatory period 2009-12
- Yi_{n-1}: change in the recognized remuneration for the distribution company "i" related to the distribution activity increase of this distributor during the year n-1. This variation includes the increase of the investment, operation and maintenance costs and other costs

Source: EY analysis

02 Wide-ranging definitions of "common" elements

"To use a metaphor from cooking, it's not just the overall recipe that may be different: it's the definition of what 'two eggs' means."

Louis-Mathieu Perrin, EY

What makes life difficult for anyone who needs to grasp the detail of power and gas regulation in more than one country is that it's not just the overall approach that differs. The definition of what we might assume to be common parameters – such as the components of the weighted average cost of capital (WACC) – can also be distinctly different by country.

Even when regulators are using the same kind of input categories, the level of input itself can vary widely in ways we might not expect.

Big national differences in WACC, asset beta and gearing

For regulatory structures based on RAB, it's in the definition of WACC that differences of national regulatory approach are most evident.

The cost of debt used and the tax rate embedded in WACC calculations are by nature local: they mirror local financing conditions and tax conditions, set by national and local authorities.

Two other parameters – asset beta and gearing – show clear differences in terms of national regulators' points of view. Tables 1 and 2 show the differences in various countries that base their regulatory structure on a WACC remuneration.

Asset beta – a matter of local judgment

In general, regulated assets are considered less risky and as a consequence they benefit from a relatively low beta.

But there are clear differences. If you look at a sample of electricity asset beta taken into consideration by regulators at year end 2012, you can see it ranges from 0.3 in Slovakia to 0.4 in Poland and Finland (Table 1).

For gas, our sample for the same time frame ranged from 0.3 in Slovakia and Finland to 0.58 for gas transport in France (Table 2).

This clearly indicates that national regulators continue to apply their own judgment in setting this parameter, based on their unique view of the relative degree of risk associated with this type of asset in their local environment.

Gearing – generally on the rise, but wide local differences also evident

In the past few years, gearing has notably increased as a consequence of the increase in capex spend, which has been predominantly funded by debt. Nevertheless, gearing also demonstrates local differences due to the current structure of regulated operator balance sheets.

For electricity, gearing embedded in regulatory assumptions, based on our sample from year-end 2012, ranges from 30% in Finland to 60% in many countries, including France and Germany (see Table 1).

Table 1. Illustration of WACC components – electricity

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

Source: EY analysis

Table 2. Illustration of WACC components – gas

Illustration of WACC components – gas										
	Germany	Poland	Finland		Czech Republic	France		Slovakia	Greece	Switzerland
	T&D	T&D	Distribution	Transport	Distribution	Distribution	Transport	Distribution	Transport	T&D
Risk free rate	3.80%	5.421%	1.82%	1.82%	4.60%	2.20%	2.0%	4.01%	0.63%	2.32%
Debt spread	0.60%	N/A	1.8%	1.8%	N/A	0.60%	0.60%	N/A	N/A	0.55%
Asset beta	**0.32**	**0.40**	**0.3**	**0.3**	**0.40**	**0.46**	**0.58**	**0.3**	**N/A**	**0.4**
Equity beta	0.79	0.69	0.397	0.357	N/A	0.76	0.96	N/A	0.50	1
Market risk premium	4.55%	4.80%	5%	5%	6.40%	5.0%	5.0%	3%	5.90%	3.9%
Gearing (debt/ debt + equity)	**60%**	**42%**	**30%**	**20%**	**40%**	**50%**	**50%**	**60%**	**27.6%**	**60%**
Tax rate	15.82%	19%	26.00%	26.00%	19%	34.43%	34.43%	20.00%	20.00%	19.20%
Cost of debt	3.80%	6.42%	3.62%	3.62%	4.91%	2.8%	2.6%	5.13%	5.95%	2.87%
Cost of equity	9.05%	8.73%	5.01%	6.80%	8.54%	9.2%	10.4%	6.00%	12.9125%	N/A
WACC	5.90%[1]	8.95%[1]	4.32%[1]	5.99%[1]	8.288%[1]	6.0%[2]	6.5%[2]	6.04%	10.99%	4.21%

1. Nominal rate
2. Real rate

Source: EY analysis

For gas, our sample shows gearing ranges from 20% in Finland for gas transport and 28% in Greece for gas transport to 60% in a number of countries, notably Germany (see Table 2).

It's interesting to note that some countries do not apply the same gearing assumption for gas and electricity. One reason for this is that the regulatory periods are not strictly identical.

Differences in investment incentives

Investment incentives offered by various regulators also show significant local variation. Some regulators offer the same return for all types of investment, but others offer a premium on certain types.

For example, for Italian gas transport-related activities over the regulatory period 2010 to 2013, specific incentives are given for certain types of investment, compared with the base return of 6.4%[5] (see Table 3). The objective is to encourage development of the network, in particular import capacities.

Meanwhile, in France, in the previous regulatory period, a specific investment premium of 3% was awarded to growth investments aimed at reducing congestion on the gas transport system (fluidity investments). In the current regulatory period, which began in December 2012, the investment premium is still 3%, but the number of projects eligible to receive it has been significantly reduced.

Table 3. Incentives in Italian gas transport 2010 to 2013

Category	Short ref.	Additional return
Maintenance	T_1	
Safety, quality and market support	T_2	1% for 5 years
Development of regional network	T_3	2% for 7 years
Development of national network	T_4	2% for 10 years
Development of national network for import	T_5	3% for 10 years
Development of entry capacity at border	T_6	3% for 15 years

Source: EY analysis

5. Pre-tax applied for base investment.

03 Widespread downward trend in rate of return

Despite the wide-ranging methods of regulation, one goal European regulators share is a desire for better service for less or equivalent money. If we look at recent regulatory determinations, there is a clear trend for regulators to tighten the screws. Returns are coming down.

This downward trend principally reflects a decrease in the debt component of the allowed return, as a consequence of lower debt spreads in the countries that have not been too badly affected by the European debt crisis.

It also reflects a lowering of the risk premium associated with regulated activities and a re-weighting of the debt component in the gearing to match the real capital structure of companies (which is geared more toward debt than equity). The decrease also reflects the regulators' desire to keep up with broader economic and financing environments.

We can see clear evidence for a generalized downward pressure on rates of return in:

- Germany: for gas and electricity distribution and transmission, the allowed return on equity for the first regulatory period (2009 to 2013) for assets capitalized before 1 January 2006 was 7.56% nominal pre-tax and 9.29% pre-tax for assets capitalized after this date. For the second regulatory period (2014 to 2018), the allowed return on equity will move down to 7.14% for assets capitalized before 1 January 2006 and 9.05% for assets capitalized after this date.
- Switzerland: for electricity distribution, WACC went down from 4.25% in 2011 to 4.14% in 2012 and 3.83% in 2013, tracking the downward move in the yield on government bonds.
- Poland: the equity risk premium taken into account in the WACC calculation for electricity distribution and transmission will gradually move down from 4.9% in 2012 to 4.6% in 2015. The gearing assumed will increase from 38% to 50% over the same period, contributing to an overall decrease in the allowed return.
- France: the recent regulatory decision for gas transport lowered the allowed return to 6.5% from 7.25% in the previous regulatory period.

Assessing "real" performance with regulatory accounts

While putting pressure on returns, regulators are also tending to narrow the scope of external factors beyond the operators' control, which may affect their financial performance. The focus is turning more to assessing their "real" performance, based on their own business conduct.

Aside from efforts to accurately identify "noncontrollable" costs (which are generally fully compensated in the regulatory formula), one key development is the use of regulatory accounts. These accounts compile all the elements that are not fully under one company's control: factors such as change in volume distributed or transported, or nonrecurring revenue or expenses.

If we take an example from France, Figure 7 shows the result of a recent regulatory decision for gas transport activities. The French Regulatory Commission of Energy (CRE) increased the scope of elements included in the regulatory account to reflect the difference between forecast inflation and actual inflation for the annual resetting of opex.

Increasing the scope in this way makes it possible for regulators to limit or smooth out the financial impact of factors that are not under the operator's direct control.

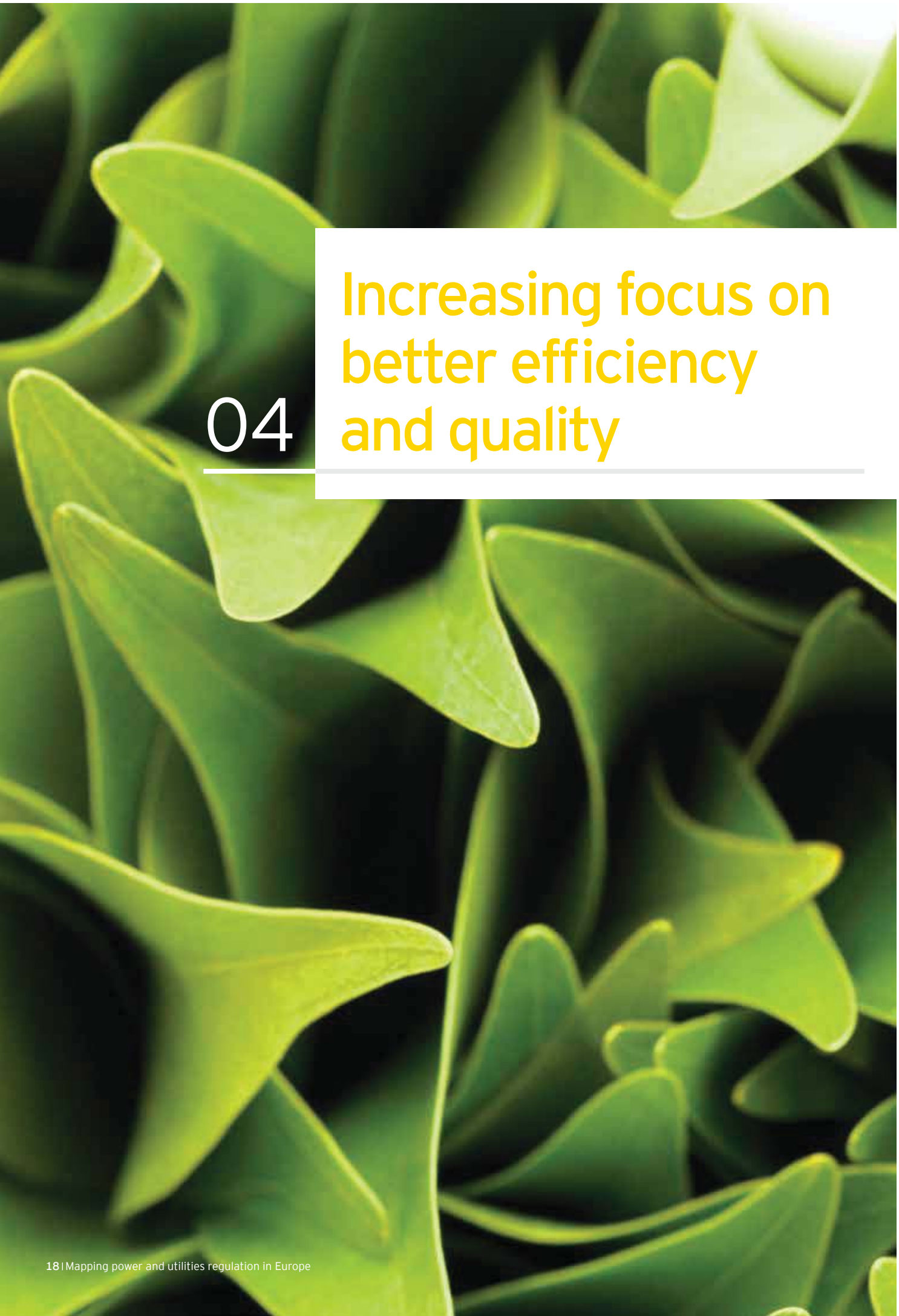
Figure 7. Regulatory account – gas transport in France, Q4 2012

Area of variance	Coverage %
Revenues	
Downstream transport revenues	
Revenues linked to storage facility entry and exit points	*100%*
Upstream transport revenues	
Discrepancy less or equal to +/–10%	*50%*
Discrepancy superior to +/–10%	*100%*
Income from connection of combined cycle – gas turbines	100%
Capital costs	
RAB remuneration	100%
Depreciation	100%
Assets in progress	100%
Noncontrollable costs	
Energy costs	80%
Discrepancy between forecast and real inflation rate for Opex	100%
Financial incentives	
Incentive mechanisms applicable to investment costs	100%
Incentive mechanisms applicable to quality indicators	100%
Other items	
Interconnection costs/revenues	100%

Source: EY analysis of CRE Q4 2012 gas transport regulatory decision

Germany has also developed a regulatory account, notably including a change in volume distributed. If less energy is actually transmitted or distributed in a fiscal year, not all fixed costs are covered. The difference is balanced on the regulatory account and will be billed in the next fiscal year.

In addition to these regulatory accounts, some regulators, including France and the UK, have developed reopener clauses that authorize adjustments to the net opex trajectory after a certain period (but only under certain conditions, and not in the first year of the regulatory period). In particular, the regulator may reconsider potential consequences of new legal, tax and administrative provisions and court decisions if they have a substantial impact on the net opex in the tariff.



04 Increasing focus on better efficiency and quality

Another shared goal among regulators is a desire for better efficiency and better-quality performance from operators. This is being targeted with a variety of levers, including growing use of benchmarking. Developments in Slovakia are typical of the increasing interest regulators are showing in benchmarking beyond domestic borders (see below, page 35).

General efficiency targets

General efficiency targets have to be reached in a uniform manner by all companies during the regulatory period. Examples include:

- Czech Republic: for electricity distribution, over the third regulatory period (2010–14), the general efficiency target companies have to achieve is 9.75% (2.031% annually).
- Finland: the regulator has set an efficiency target of 2.06% per year in the current regulatory period, for electricity distribution and transmission system operators.
- Poland: the efficiency target is 2.38% throughout the current regulatory period for electricity transmission and distribution.
- Germany: the target is set at 1.25% per annum in the first regulatory period and 1.50% in the second regulatory period for all regulated activities.
- Slovakia: the target is 3.5% per year during the 2012–16 regulatory period for all regulated companies except gas transport.

These targets are applied by deducting the target percentage from the annual authorized tariff increase. Targets of this kind are used in regulated monopoly markets to replicate the pressure of competition and draw on the RPI-x approach originally introduced in the UK.

Company-specific targets

Regulators will set company-specific targets to narrow and eventually eliminate the cost performance differential between different operators that have the same characteristics.

A good example is Germany, where the regulator conducts a benchmarking exercise to determine company-specific targets according to the principles outlined below. The aim is to set efficiency limits based on a combination of inputs (e.g., total costs) and outputs (e.g., electricity transmission in kWh). Each grid operator's inefficiencies are determined based on their position relative to these limits.

- Two methods are used to determine efficiency: data envelopment analysis (DEA) and stochastic frontier analysis). Because the two methods are based on different approaches (stochastic and non-stochastic), they may deliver different results.
- For electricity, the timeline of the German benchmarking exercise has run as follows: cost audit in 2006 (sample year) for benchmarking in 2008, first application in the first regulatory period in 2009. In 2012, audit of costs in year 2011 (sample year) for benchmarking in 2013, first application in the second regulatory period in 2014.
- In the first period, German DSOs had to reduce 10% of their inefficient costs per year. In the second period, they will have to reduce 20% of inefficient costs.

Slovakia also runs a comparative analysis when setting gas transport tariffs. The supporting documentation to the price proposal for the 2012–16 regulatory period is a comparative analysis of prices charged by natural gas transport operators in the EU. The analysis primarily compares transport operators that use an input-output tariff system and operate in Slovakia's neighboring countries.

Focus on specific cost items

Certain cost items are of particular importance to regulated activities, and some regulators are focusing on developing specific incentive mechanisms in relation to those costs.

Network losses

Network losses are one of the key areas where specific cost containment targets have been developed by national regulators. Figure 8 shows an incentive mechanism applied to the compensation of network losses in Spain.

In some countries, operators are penalized not for the volume of losses but for the unit cost of losses. Regulators are trying to offer incentives to companies to hedge their exposure, rather than compensate network losses by buying electricity on the spot market.

Figure 8. Spain's incentive mechanism for network losses

$$\text{Incentive}_j = \alpha * \sum P^h * \left(\text{Eobj}^h{}_j - \text{Ereal}^h{}_j\right)$$

Where:

Ph: losses energy price, in €/kWh for the hour "h." This price is the hourly price of the Spanish electricity market.

α: coefficient weighting how much is kept by the distribution company from the profit earned by the system as a result of losses reduction. Established in 0.2 in a transitional way and applicable since 1 January 2011.

$\text{Ereal}^h{}_j$: Real energy lost by the distributor "j" at the hour "h," in kWh.

$\text{Eobj}^h{}_j$: Loss energy target for the distribution company "j" in the hour "h," in kWh.

The incentive for losses is calculated on an annual basis and fluctuates between +/–2% of the total remuneration received by the distribution company in the previous year.

Bonus/malus schemes

Apart from straight opex containment targets, we see regulators focusing on investment costs by creating bonus/malus schemes that offer incentives to operators to minimize overruns.

A good example is France, where a recent regulatory decision in the gas transport sector implemented the following mechanisms:

- For capex benefiting from the 3% fluidity premium (growth investments of specific importance), spending over 110% of the target budget would be excluded from the perimeter of the premium.
- For capex not benefiting from the 3% fluidity premium, spending over 110% of the target budget would face a 25% penalty applied to the overspending above that threshold.
- Outperformance compared with the target budget would be rewarded through a symmetrical mechanism.

In granting this risk/reward mechanism, the regulator aims to reinforce budget control on capex at the operator level.

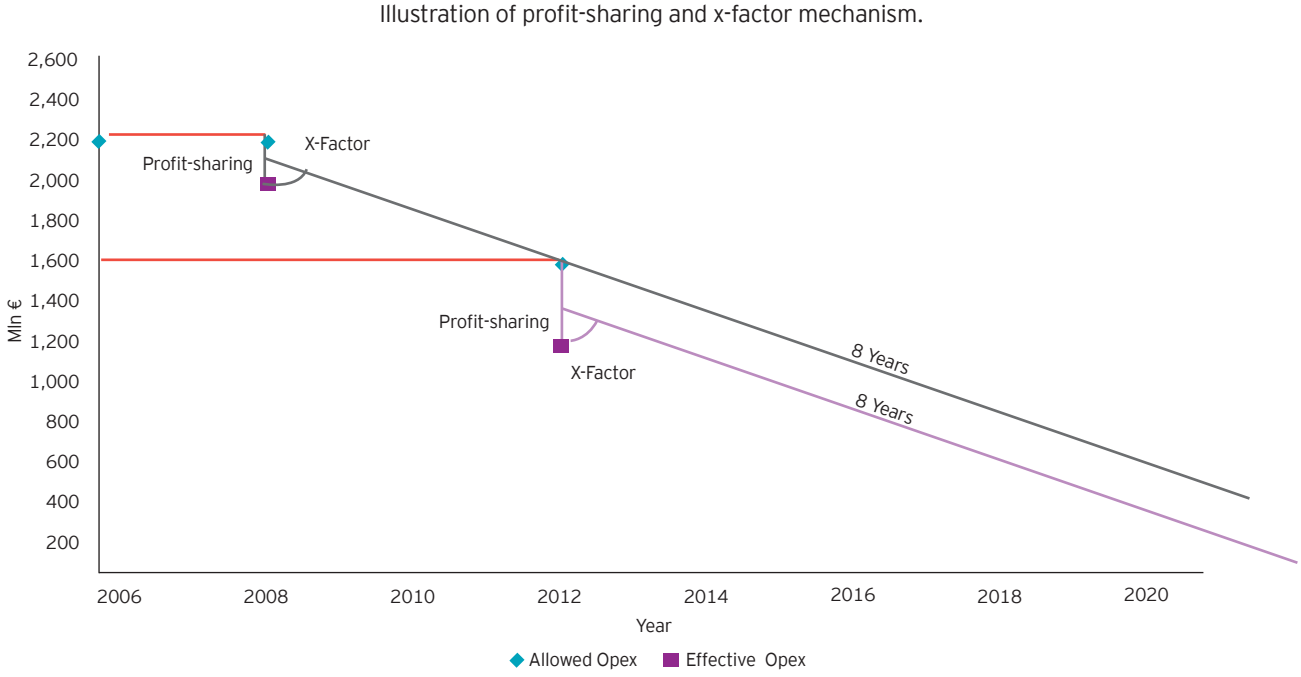
Profit-sharing mechanisms

While pushing companies to minimize costs by setting specific efficiency targets, regulators are allowing them to retain the benefit where they outperform their target — at least temporarily, until the next regulatory period. But operators who underperform are being forced to bear the cost.

In Germany, a calculation is performed annually of the difference between the allowed revenue set by the regulator and the actual revenue linked to distributed electricity. In the case of a positive performance, which is not linked to a change in volume distributed, the network operator is awarded 100% of the difference. In the case of a negative performance, the network operator has to absorb 100% of the difference. If deviation within a period is too high (i.e., actual revenue differs from allowed revenue by more than 5% for electricity), compensation must be adjusted within the period to avoid exorbitant revenue deviations.

Some countries maintain a 50% sharing mechanism around this outperformance/underperformance target, to smooth out the financial impacts for operators and their customers.

Figure 9. Italian electricity sector — sharing the benefits of outperformance with consumers



Source: EY analysis

In the Italian electricity distribution sector, if the gap between allowed costs and effective costs is positive, the regulator decreases opex remuneration through a "profit-sharing mechanism" and an "X-factor mechanism" (see Figure 9). The former provides that the 50% of the "extra-remuneration" is immediately discounted from the tariff. The latter provides that the other 50% is reduced on a straight-line basis over the next eight years.

Quality targets

We've seen increasing interest in tools to encourage and even force regulatory efficiency on the operator cost base. The latest evolution is development of quality targets, which aim to ensure that operators do not reduce costs at the expense of the good system performance.

These quality incentive schemes can involve financial incentives/penalties. For example, in:

- Finland: actual annual outage costs are compared with a "reference level" of outage costs. An electricity quality impairment lowers the permitted rate of return for the system operator. For DSOs, half the difference between the reference level of outage costs and the actual level may have an impact equal to a maximum of 20% of the reasonable return for the year.
- The Netherlands: a "Q-factor" impacts the annual change in tariff based on the following factors:
  - Quality performance
  - Valuation by businesses
  - Valuation by households
  - Customer average interruption duration
  - System average interruption frequency

  The Q factor is set at a maximum of 5% bonus or malus on regulatory revenue for the current regulation period. In past regulation periods, the Q-factor has been nil.
- Romania: for electricity distribution, in the second regulatory period, the annual level of revenues subject to penalties/bonus risks related to falling short of or surpassing the quality indicators cannot be higher than 2%. However, for the third regulatory period, it will increase to a maximum of 4% of revenues.
- Spain: for electricity distribution, the limit of the quality incentive is 3% of remuneration; the limit for the incentive for losses is 2% of remuneration.

Pointing the way to stronger quality incentives

The recent Returns = Incentives + Innovation + Outputs (RIIO) regulatory decision by the UK regulator Ofgem has introduced an extensive and potentially impactful set of quality and performance indicators to incentivize regulated companies to deliver strong performance across the board.

The RIIO framework was implemented from 1 April 2013 for an eight-year price control period (GD1) for gas distribution companies. These companies must deliver against six policy areas:

- Safety
- Environment
- Customer satisfaction
- Connecting customers
- Social obligation to vulnerable customers
- Reliability and availability of the network

These policy areas and the related outputs and incentives are summarized in Table 4.

Table 4. Ofgem's RIIO quality and performance indicators and related incentives

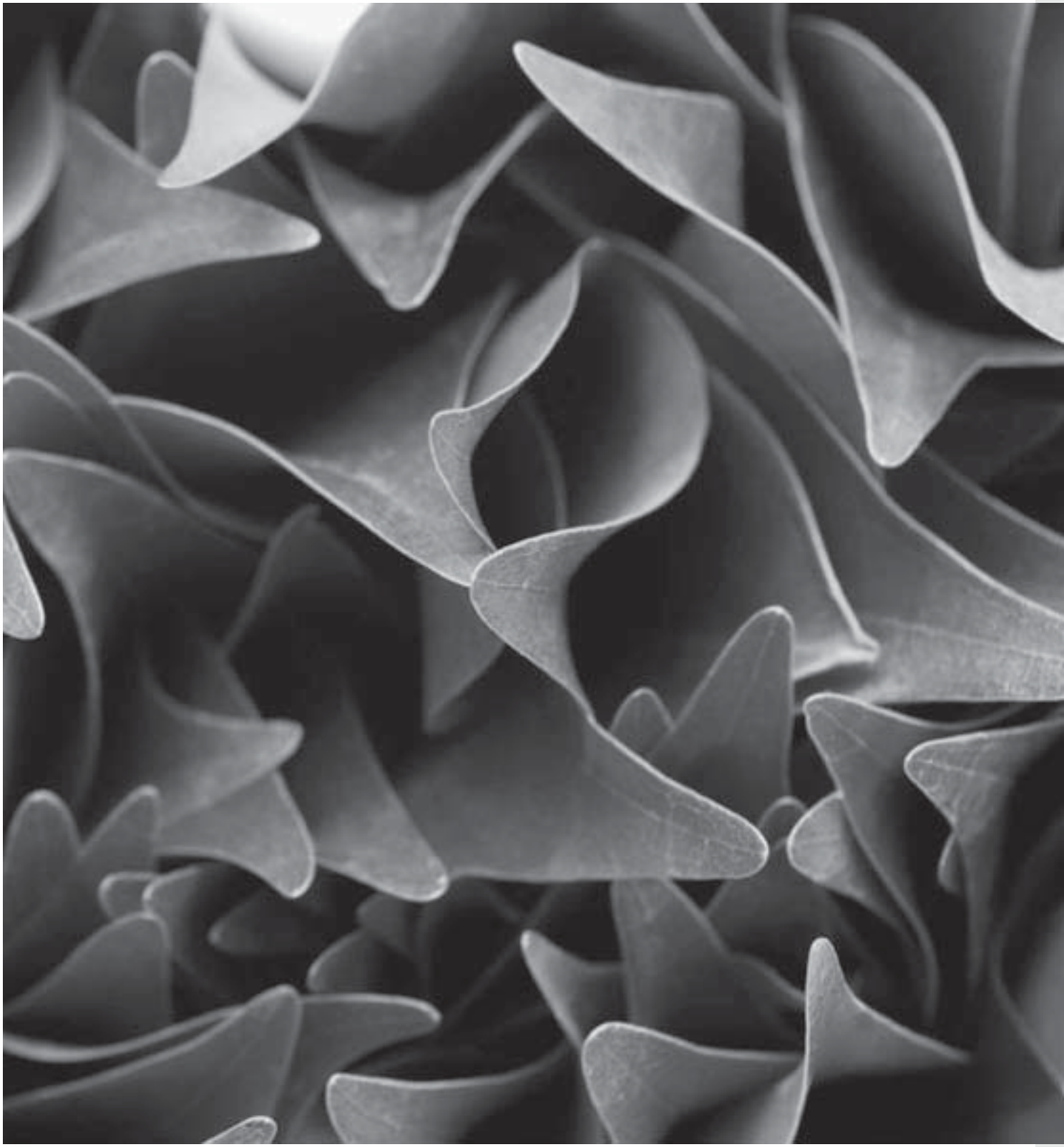
Policy area	Principal outputs/secondary deliverable	Incentive mechanism
Environment (broad measure)	▸ Report on percentage of biomethane capacity connected ▸ New connection standards and provision of information for biomethane connections ▸ Separate process to consider connection boundary and charging arrangements for biomethane	▸ Reputational incentive in relation to biomethane connections ▸ Discretionary reward scheme (DRS) of up to £12m for companies that deliver environmental outputs not funded at price control review
Environment (narrow measure)	▸ 15%–20% reduction in gas transport losses ▸ Reductions in business carbon footprint (BCF), and other emissions and resource use	▸ Strengthened shrinkage allowance incentive and environmental emissions incentive (EEI) by: 1. Aligning carbon value with DECC's non-traded carbon value, and 2. Introducing rolling incentive mechanism
Customer service	▸ Broad measure of customer service, comprising customer satisfaction survey, complaints metric and discretionary reward for stakeholder engagement	▸ Financial incentive of +/-1% allowed revenue
Social obligations	▸ Up to 80,000 connections to poor households ▸ Increased carbon monoxide (CO) public awareness	▸ Review of connections to poor households at the end of the period; penalty for under delivery ▸ Comparative assessment of CO awareness; reward through stakeholder engagement ▸ DRS for companies delivering outputs in relation to social objectives not funded at review
Customer connections	▸ Maintain current guaranteed standards ▸ New connection standards of service for distributed gas entry customers during RIIO-GD1	▸ Penalty payments through guaranteed standards of performance.
Safety	▸ 40%–60% reduction in safety risk ▸ Compliance with statutory health and safety requirements	▸ Safety risk: review of output performance at the end of RIIO-GD1, and requirement to carry-over under delivery ▸ Statutory enforcement
Reliability	▸ Expected number and duration of interruptions ▸ Asset health/risk scores ▸ Achieving 1 in 20 capacity obligation ▸ Asset load/capacity utilization ▸ Maintaining operational performance	▸ Asset health/risk/load: review of output performance at the end of RIIO-GD1, and requirement to carry-over under delivery

Source: Ofgem

RIIO will continue to be the basis for regulation in the UK. Ofgem is currently consulting with the electricity distribution companies on the implementation of RIIO for the price control period commencing 1 April 2015.

Fairness and realism

The current focus on quality and performance shows that European regulators are increasingly interested in granting regulated companies a fair return that not only reflects the efficiency of their operations and cost base but also the quality of service delivered to customers and stakeholders.



Conclusion

We believe that power and gas regulation in Europe will remain national in nature, with no single European scheme envisaged in the near feature. We can expect national regulators to continue to benchmark each other, looking for new ways to achieve the best service and regulatory performance at a reasonable cost.

But while convergence around the drive to efficiency, quality and cost reduction will continue, the diverse nature of regulation across the region will also continue to present challenges and possibly instability to all power and utility stakeholders. EY's April 2013 *Business Pulse* report ranked compliance and regulation as the number one risk in 2013 for power and utility companies. This underlines how important it is to understand how local regulatory structures continue to evolve.

Political interference continues to create instability

Perhaps the greatest unknown in the whole equation is the continued risk of political interference. As commodity prices have increased, consumers have had to pay higher and higher prices for power and gas. Paying higher prices is something voters do not like to do. This focuses the mind of public authorities on the power and gas sector and increases the likelihood of interference with regulatory decisions.

Interference of this kind can cause instability and uncertainty for those trying to run profitable energy businesses. The length of the regulatory period (which can range from one to eight years with a standard duration of about four to five years) is not a guarantee of stability per se, as interference can happen any time.

A stark example is France, where years of interference in tariff setting for gas eventually led retail suppliers to challenge tariff decisions in court. The 2012 decision by the French High Court that the regulatory gas price formula had to be applied led to a retroactive charge for hundreds of thousands of retail customers. The consequences of such instability can include significant swings in revenue and extended time lags in recovering costs.

Other striking examples of recent interference have included taxation of regulated infrastructure in countries, including Spain and Italy, which has in some cases indirectly reduced the return on investment below the nominal level set by the regulator. Meanwhile, Spain's large tariff deficit has driven local authorities to contemplate structural changes to the regulatory model for power and utilities.

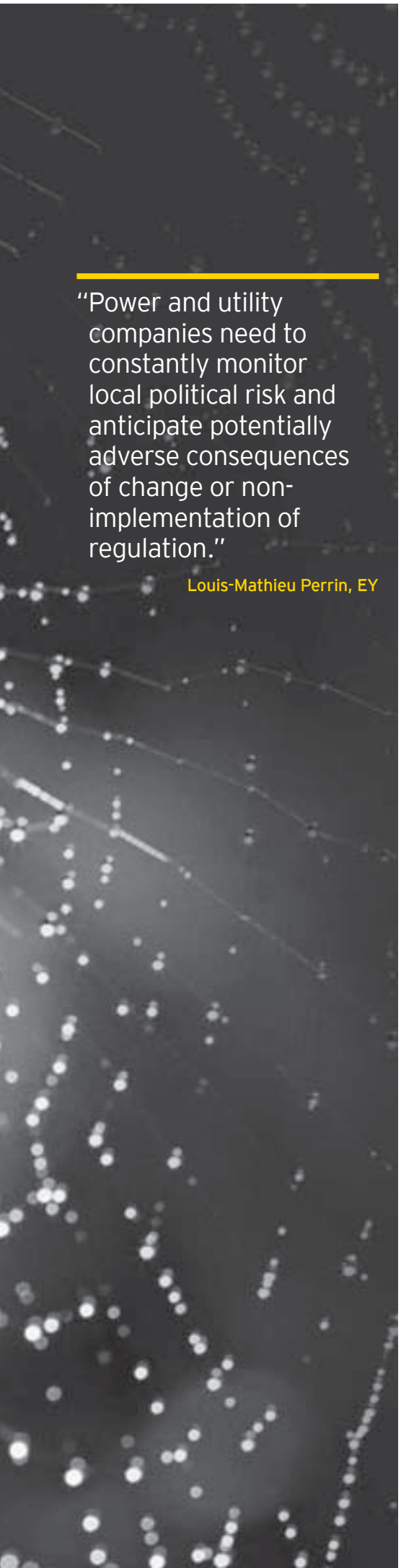
Constant change in regulation can seriously disrupt investment planning and fundraising, as well as cause difficulties in managing relationships with investors.

Knowledge is power

We hope that CFOs, local country management, transactions teams and regulators will all find this document a useful tool to compare and contrast regulation in their home markets and abroad.

- Constantly monitoring regulation across the region will help CFOs anticipate potential changes in environment, provide a useful source of ideas for running the business, help with change management planning and provide ammunition to support discussions with regulators.
- With regulators increasingly running national and international comparisons, local country managers may well be asked to match the performance of another country. It's useful to be armed with your own benchmarks to argue the case if this performance is based on factors that can't be replicated in your home territory. Understanding a range of regulatory structures will also enable local managers to run more informed conversations with regulators.
- When assessing acquisitions or investments in new territories, it's easy to make the wrong decision based on a misunderstanding of regulatory differences. You also may not have political connections or influence that will enable you to lobby for change as you could at home. History provides multiple examples of cross-border utility acquisitions that failed to deliver the value expected because the unique nature of the local regulatory environment was not properly appreciated. It's vital to read up and be prepared with a detailed knowledge before making decisions to invest or sell.

EY's Power & Utilities practice has deep knowledge of these highly complex issues and challenges and can help you assess the consequences of regulatory change. Please talk to your usual EY advisor or see page 25 for a local contact.



"Power and utility companies need to constantly monitor local political risk and anticipate potentially adverse consequences of change or non-implementation of regulation."

Louis-Mathieu Perrin, EY

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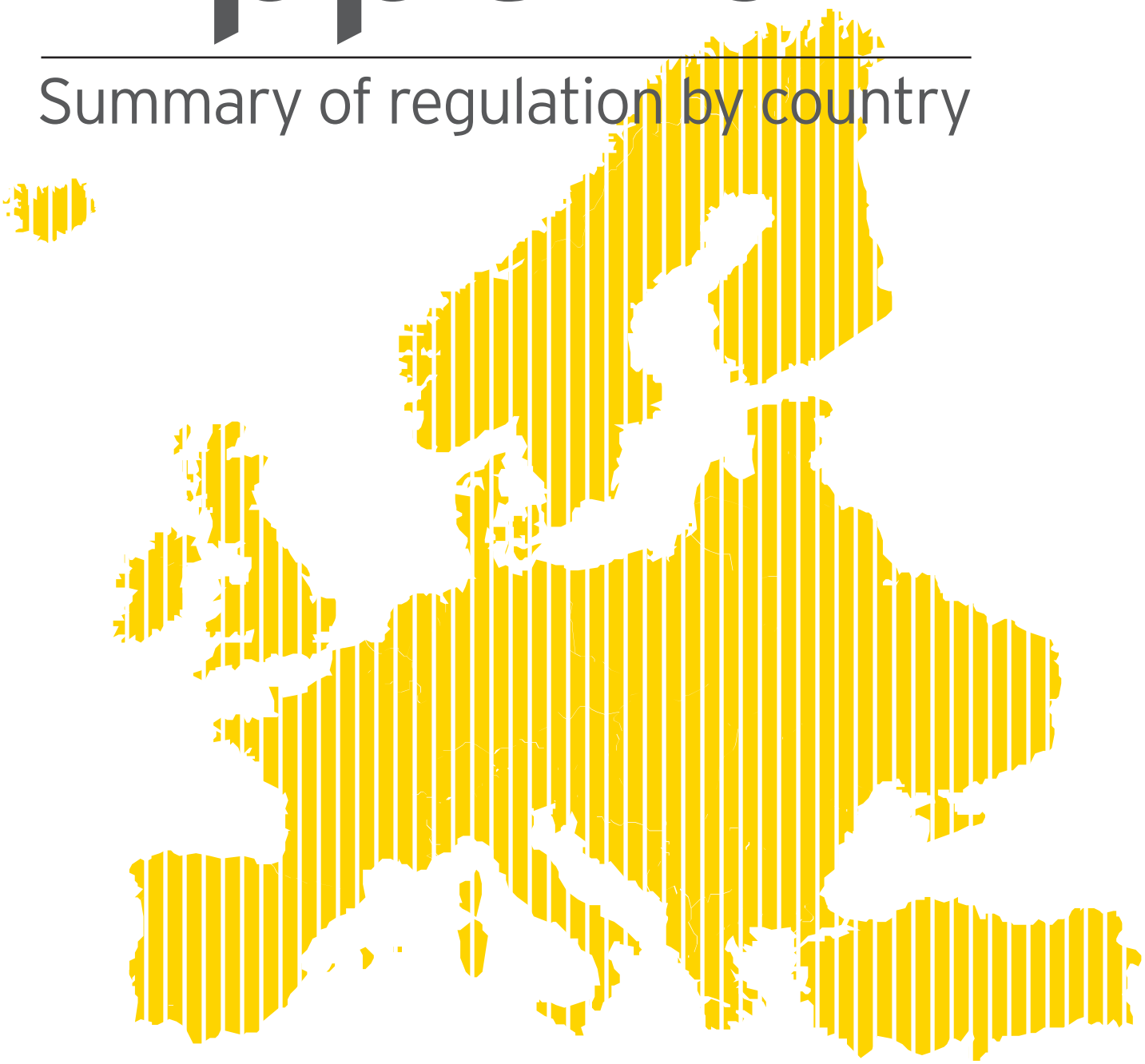
Appendix

Summary of regulation by country



Belgium

Belgium			
Activity	**Electricity distribution**	**Electricity transmission**	**Gas distribution**
Regulator	Commission de Régulation de l'Electricité et du Gaz	Commission de Régulation de l'Electricité et du Gaz	Commission de Régulation de l'Electricité et du Gaz
Format of regulation	Costs plus based	Costs plus based	Costs plus based
Regulatory period (years)	4	4	4
Regulatory periods	2009-12	2012-15	2012-15
Regulated Asset Base (RAB)	Based on the value of 31 December 2001, updated afterward	Based on the value of 31 December 2002, updated afterward	Based on the value of 31 December 2002, updated afterward
Allowed return	Between 4.63% and 8.28%	N/D	N/D
Efficiency factor	N/A	N/A	N/A
Allowed investment	Approved by the regional regulatory body	Approved by the regional regulatory body	Approved by the regional regulatory body
Allowed depreciation	Determined by Royal Decree	Determined by Royal Decree	Determined by Royal Decree
Allowed inflation	Only for manageable costs	Only for manageable costs	Only for manageable costs
Exposure to volume risk	N/A	N/A	N/A
Investments incentive	No	No	No
Other incentive mechanisms	Yes	Yes	Yes

Czech Republic

Czech Republic		
Activity	**Electricity distribution**	**Gas distribution**
Regulator	Energetický regulační úřad	Energetický regulační úřad
Format of regulation	Incentive based	Incentive based
Regulatory period (years)	5	5
Regulatory periods	2010–14	2010–14
Regulated Asset Base (RAB) (1)	Based on the residual value of assets in 2009	Based on the residual value of assets in 2009
Allowed return (2)	7.923% nominal pre-tax (2010) – subject to change during regulatory period	8.288% nominal pre-tax (2010) – subject to change during regulatory period
Efficiency factor	9.75% per regulatory period	9.75% per regulatory period
Allowed investment	2012: €610m for the whole sector	2012: €182.6m for the whole sector
Allowed depreciation (3)	Based on planned depreciation	Based on planned depreciation
Allowed inflation (4)	0,7 * IPS + 0,3 * (CPI + 0,01)	0,7 * IPS + 0,3 * (CPI + 0,01)
Exposure to volume risk	No	No
Investments incentive	No	No
Other incentive mechanisms	Yes	Yes

(1) For electricity distribution, the minimum level of revaluation coefficient is 55%, for gas distribution the minimum level is set at 50%.
(2) For gas distribution, allowed OPEX is set at the beginning of the regulatory period and if company performs better, it's converted into profit for the company.
(3) Allowed depreciation is set on the basis of the planned values of depreciation in each of the years and in year i+2 are adjusted to real (booked) values.
(4) Where CPI is the customer price index and IPS is the business service price index.

Finland

Finland		
Activity	**Electricity distribution and transmission**	**Gas distribution and transport**
Regulator	The Energy Market Authority	The Energy Market Authority
Format of regulation	Ex-ante revenue cap model and incentive based	Ex-ante revenue cap model
Regulatory period (years)	4	4
Regulatory periods	2012–15	2010–13
Regulated Asset Base (RAB)	Adjusted capital invested (replacement value)	Adjusted capital invested (replacement value)
Allowed return	RAB * WACC (%) where real WACC%: 3.19% for DSO and 3.06% for TSO	RAB * WACC (%) where nominal WACC% is different between TSO: 5.99% and DSO: 4.32%
Efficiency factor	2.06% per year	Efficiency incentive is deducted from the operating profit for TSO and DSO: N/A
Allowed investment	Based on the realized adjusted profit	N/A
Allowed depreciation (1)	Straight-line depreciation	Straight-line depreciation
Allowed inflation	CPI	CPI
Exposure to volume risk	Yes	Yes
Investments incentive	Yes	Yes
Other incentive mechanisms	Yes	Yes, for TSO only

(1) Network operators have planned depreciation but the regulator uses straight-line depreciation.

France

France				
Regulatory model	**Electricity distribution (3)**	**Electricity transmission**	**Gas distribution**	**Gas transport**
Regulator	Commission de Régulation de l'Energie	Commission de Régulation de l'Energie	Commission de Régulation de l'Energie	Commission de Régulation de l'Energie
Format of regulation	Incentive based	Incentive based	Incentive based	Incentive based
Regulatory period (years)	4	4	4	4
Regulatory periods	2009-12	2009-12	2012-16	2013-16
Regulated Asset Base (RAB)	RAB = Net asset value at opening of the period + new investment - depreciation	RAB = Net asset value at opening of the period + new investment - depreciation	RAB = Net asset value at opening of the period reinflated + new investment - depreciation	RAB = Net asset value at opening of the period reinflated + new investment - depreciation
Allowed return	7.25% nominal pre-tax, applied to the RAB on 1 January	7.25% nominal pre-tax, applied to the RAB on 1 January	6.0% real pre-tax applied to the RAB on 1 July	6.50% real pre-tax applied to the RAB on 1 January
Allowed investment	€11.9b over the regulatory period	€4.7b over the regulatory period	€2.9b over the regulatory period	€2.9b for GRT Gaz and €0.4b for TIGF both over the regulatory period
Efficiency factor	For controllable costs, setting of a specific trajectory, including yearly productivity objectives	For controllable costs, setting of a specific trajectory, including yearly productivity objectives	Overall productivity effort of €12m over the regulatory period	Increasing over the regulatory period from -0.25% to -0.75% starting from 2014 on a like-for-like basis
Allowed depreciation (1)	Based on accounting depreciation	Based on accounting depreciation	Depreciation of the RAB with an economic life ranging from 40 years for pipes to 10 years for other technical investments	Depreciation of the RAB with an economic life ranging between 50 years for pipes and 30 years for the compressors
Allowed inflation (2)	CPI - X + K	CPI - X + K	CPI - X + K	CPI – efficiency factor
Exposure to volume risk	No	No	No	Extremely limited
Investments incentive	No	No	Yes	Yes
Other incentive mechanisms	Yes	Yes	Yes	Yes

(1) For gas distribution and transmission, the RAB and the allowed depreciation are reeavaluated every year based on inflation.
(2) Where:
X is a component pre-determined by the regulator factoring in productivity efforts asked to operator and change in the perimeter of operations and amounting to -0.4% for the TURPE 3 regulatory period (electricity transmission and distribution) and -0.2% for the ATRD4 regulatory period (Gas distribution)
K = absorption of the regulatory account (capped at 2% per annum maximum)
(3) Further to a decision of the French High administrative court, the tariff for electricity distribution has been suspended. The tariff for the new regulatory period will be set in the course of 2013.

Germany

Germany				
Activity	**Electricity distribution**	**Electricity transmission**	**Gas distribution**	**Gas transport**
Regulator	Large utilities: Bundesnetzagentur Bonn office Smaller Utilities: Federal regulatory autorities	Large utilities: Bundesnetzagentur Bonn office Smaller Utilities: Federal regulatory autorities	Large utilities: Bundesnetzagentur Bonn office Smaller Utilities: Federal regulatory autorities	Large utilities: Bundesnetzagentur Bonn office Smaller Utilities: Federal regulatory autorities
Format of regulation	Incentive based	Incentive based	Incentive based	Incentive based
Regulatory period (years)	5	5	5	5
Regulatory periods	2009-13 and 2014-18	2009-13 and 2014-18	2009-12 and 2013-17	2009-12 and 2013-17
Regulated Asset Base (RAB)	N/A	N/A	N/A	N/A
Allowed return (on equity)	7.56% nominal pre-tax for assets older than 1 January 2006 9.29% nominal pre-tax for assets capitalized after 1 January 2006	7.56% nominal pre-tax for assets older than 1 January 2006 9.29% nominal pre-tax for assets capitalized after 1 January 2006	7.56% nominal pre-tax for assets older than 1 January 2006 9.29% nominal pre-tax for assets capitalized after 1 January 2006	7.56% nominal pre-tax for assets older than 1 January 2006 9.29% nominal pre-tax for assets capitalized after 1 January 2006
Allowed investment	N/A	N/A	N/A	N/A
Efficiency factor	1.25% in the first regulatory period, 1.50% in the second period	1.25% in the first regulatory period, 1.50% in the second period	-1.25% in the first regulatory period, -1.50% in the second period	-1.25% in the first regulatory period, -1.50% in the second period
Allowed depreciation	Based on accounting depreciation	Based on accounting depreciation	Based on accounting depreciation	Based on accounting depreciation
Allowed inflation	CPI – efficiency factor	CPI – efficiency factor	CPI – efficiency factor	CPI – efficiency factor
Exposure to volume risk (1)	No	No	No	No
Investments incentive	No	No	No	No
Other incentive mechanisms (2)	Yes	Yes	Yes	Yes

(1) There is only a timing difference from fiscal year to fiscal year. Net access fees are ct/kWh price based on the expected amount of distributed electricity. If less electricity is actually distributed in a fiscal year not all fixed costs are covered. Difference will be balanced on the regulatory account and will be billed in the next fiscal year.

(2) Calculation on annual basis of the difference between the allowed revenues set by the regulator and the actual revenues linked to the distributed electricity. In case of a positive performance, not linked to a change in volume distributed, the network operator is awarded 100% of the difference.

Greece

Greece				
Activity	**Electricity distribution**	**Electricity transmission**	**Gas distribution**	**Gas transport**
Regulator	Regulatory Authority for Energy (RAE)	Regulatory Authority for Energy (RAE)	Regulatory Authority for Energy (RAE)	Regulatory Authority for Energy (RAE)
Format of regulation (1)	Rate of Return Regulation – form of revenue cap	Rate of Return Regulation – form of revenue cap	Revenue cap	Tariffs are estimated considering natural gas demand and required revenue to cover OPEX and CAPEX
Regulatory period (years)	1	1	1	4
Regulatory periods	N/A	N/A	N/A	N/A
Regulated Asset Base (RAB)	N/A – RAB 2011: €2.855m. RAE did not acknowledge the asset revaluation surplus.	Based on net asset values, also taking into consideration Work in Progress and Working Capital. RAB 2011: €1.347m – RAE did not acknowledge the asset revaluation surplus.	N/A	Net book value of assets excluding investment subsidies – grants, also taking into consideration Work in Progress and Working Capital.
Allowed return	The allowed rate of return is 8% of the RAB.	2011: 8% nominal pre-tax	According to the distribution licenses, the annual revenue of distributors of natural gas should not exceed the predetermined revenue cap set in the distribution license.	10.99% nominal pre-tax
Allowed investment	2011: €320m	The projected investments are compared a posteriori to the actual one and relevant adjustment is made to the t+2 allowed revenue.	N/A	N/A
Efficiency factor	No	No	N/A	N/A
Allowed depreciation	Based on accounting depreciation. Allowed depreciation 2011: €141m	Based on accounting depreciation. Depreciation recognized: €74.6m for 2011	N/A	Based on accounting depreciation
Allowed inflation	No	No	No	1.50%
Exposure to volume risk	No	Yes	N/A	No
Investments incentive	No	No	No	No
Other incentive mechanisms	No	No	No	No

(1) Rate of Return Regulation principles: $E1 = O + A + (V - D) \times \rho$
Where
E1 = Yearly revenue
O= OPEX including maintenance cost
A= Yearly depreciations
V= Mean pre-estimated value of assets
D= Mean pre-estimated value of depreciation of assets
ρ= rate of return

Italy

Italy				
Activity	**Electricity distribution**	**Electricity transmission**	**Gas distribution**	**Gas transport**
Regulator	Regulatory Authority for Electricity and Gas	Regulatory Authority for Electricity and Gas	Regulatory Authority for Electricity and Gas	Regulatory Authority for Electricity and Gas
Format of regulation	Cost plus and incentive based	Revenue cap and incentive based	Cost plus and incentive based	Revenue cap
Regulatory period (years)	4	4	4	4
Regulatory periods	2012-15	2012-15	2009-12	2010-13
Regulated Asset Base (RAB)	No amount established, but the components are identified by the regulator	N/A	Net investments for distribution and measurement activities	N/A
Allowed return	7.60% WACC plus an addition ranging from 1.5% to 2% for the investments covered by incentives	7.4% WACC plus 1% for incentives mechanisms	8.0% over net investments in measurement assets and 7.6% over net investments in distribution assets	6.4% pre-tax
Efficiency factor (1)	The tariff mechanism includes an "X Factor"	N/A	N/A	N/A
Allowed investment (2)	The company shares with the regulator a three-year investment plan	N/A	N/A	N/A
Allowed depreciation	Based on technical lives of assets as published by the regulator	Based on technical lives of assets as published by the regulator	Based on accounting depreciation	Based on technical lives of assets as published by the regulator
Allowed inflation	Included in WACC	CPI	N/A	Yearly adjusment of RAB and revenues
Exposure to volume risk	No	Yes	No	Extremely limited
Investments incentive	Yes	Yes	Yes	Yes (3)
Other incentive mechanisms	Yes	Yes	No	No

(1) The "X Factor" should reduce the remuneration of the OPEX over the regulatory period to push the distribution operators in developing efficiencies in OPEX.
(2) Usually the effective CAPEX reflect those planned investments (also to reach the incentives). There is in place a bonus/malus scheme related to the network efficiency objectives. There is no maximum limit to the investments.
(3) Gas Transport: Extra-return allowance on new investments distinguished in: (i) safety (ii) development in capacity or (iii) development of input capacity.

The Netherlands

The Netherlands		
Activity	**Electricity distribution**	**Gas distribution**
Regulator	Nederlandse Mededingingsautoriteit Energiekamer	Nederlandse Mededingingsautoriteit Energiekamer
Format of regulation (1)	Incentive based	Incentive based
Regulatory period (years)	3 (currently)	3 (currently)
Regulatory periods	2011-13	2011-13
Regulated Asset Base (RAB)	N/C	N/C
Allowed return	6.2% nominal pre-tax	6.2% nominal pre-tax
Allowed investment	No	No
Efficiency factor	6.9% for the entire regulatory period	2.5% annually
Allowed depreciation	Based on accounting depreciation	Based on accounting depreciation
Allowed inflation	CPI – efficiency factor	CPI – efficiency factor
Exposure to volume risk	No	No
Investments incentive	Yes	Yes
Other incentive mechanisms	Yes	Yes

Poland

Poland		
Activity	**Electricity transmission & distribution**	**Gas transport & distribution**
Regulator	Urząd Regulacji Energetyki (URE) – Energy Regulatory Office (ERO)	Urząd Regulacji Energetyki (URE) – Energy Regulatory Office (ERO)
Format of regulation	Cap regulation with cost plus mechanism and Rate of return regulation	Cap regulation with cost plus mechanism and Rate of return regulation
Regulatory period (years)	4	4
Regulatory periods	2012-15	2011-14
Regulated Asset Base (RAB)	RAB valued as on 31 December 2008	RAB for each DSO valued based on the book value of assets
Allowed return (1)	pre-tax, 2012: 9.624%, 2013: 8.949%, 2014: 8.889%, 2015: 8.828%	pre-tax, 2012: 9.624%, 2013: 8.949%, 2014: 8.889%, 2015: 8.828%
Allowed investment	Total investments in 2012: PLN6b	Total investments in 2011: PLN2.3b
Efficiency factor (2)	2.38% throughout current regulatory period	Efficiency factor for the whole sector: ranging from -9% to -7% Individual efficiency factor ranging from -8.70% to -1.13%
Allowed depreciation	Based on accounting depreciation	Based on accounting depreciation
Allowed inflation	CPI - efficiency factor	Annual average inflation rate based on the assumptions made by the Government
Exposure to volume risk	Yes	Yes
Investments incentive	No	No
Other incentive mechanisms	No	No

(1) These amounts are subject to annual update based on actual risk-free rate. For gas transport and distribution, those factors are not used for the tariff years 2012/2013 and 2013/2014.
(2) Each DSO is assigned an individual yearly efficiency factor but these are not publicly available.

Romania

Romania		
Activity	**Electricity distribution**	**Electricity transmission**
Regulator	National Authority for Electricity Regulation (ANRE)	National Authority for Electricity Regulation (ANRE)
Format of regulation	Tariffs baskets cap based	Price cap based
Regulatory period (years)	5	5
Regulatory periods	2012-2017	N/D
Regulated Asset Base (RAB) (1)	RABt 31 Dec = RAB 1 Jan+IAt-EAt-AMrt	RABt 31 Dec = RAB 1 Jan+IAt-EAt-AMrt
Allowed return	10% nominal pre-tax	N/D
Efficiency factor	Efficiency factor is calculated on the results of the previous regulatory period with a minimum of 1%	N/D
Allowed investment (2)	As of 1 April of the previous year preceding the start of a new regulatory period, the DSO has the obligation to submit for approval to ANRE the investment program for the future regulatory period.	N/D
Allowed depreciation	Straight-line method applied to RAB	Straight-line method applied to RAB
Allowed inflation	Up to 7%. Above 7%, quarterly increase in tariffs can be requested by DSO	Up to 5%. Above 5%, quarterly increase in tariffs can be requested by TSO
Exposure to volume risk	No	No
Investments incentive	No	No
Other incentive mechanisms	Yes	No

(1) Where:
RRABt: RAB authorized return for the year t
RRR: authorized return rate;
RABt 1 Jan: RAB as at 1 January year t
RABt 31 Dec: RAB as at 31 December year t
IAt: fixed assets additions during the year t
EAt: fixed assets disposals during the year t (sold, written off, transfered)

(2) ANRE can reject the capital expenditure program if the investments proposed are not considered prudent. This program, once approved, will be fully included in RAB.

Slovakia

Slovakia			
Activity	**Electricity distribution**	**Electricity transmission**	**Gas distribution**
Regulator	Úrad pre reguláciu sieťových odvetví	Úrad pre reguláciu sieťových odvetví	Úrad pre reguláciu sieťových odvetví
Format of regulation	Price cap	Price cap	Price cap
Regulatory period (years)	5	5	5
Regulatory periods	2012–16	2012–16	2012–16
Regulated Asset Base (RAB)	RAB is based on the residual value of assets in 2006. RAB is increased during the regulatory period by the difference between CAPEX (2006–11) and sum of depreciation.	RAB is based on the residual value of assets in 2006. RAB is increased during the regulatory period by the difference between CAPEX (2006–11) and sum of depreciation.	RAB is based on the residual value of assets in 2006. RAB is increased during the regulatory period by the difference between CAPEX (2006–11) and sum of depreciation.
Allowed return	Allowed profit = WACC * RAB (WACC for 2012: 6.04% – subject to changes during regulatory period)	Allowed profit = WACC * RAB (WACC for 2012: 6.04% – subject to changes during regulatory period)	Allowed profit = WACC * RAB (WACC for 2012: 6.04% – subject to changes during regulatory period)
Allowed investment (1)	Allowed profit already takes into account the extent of investments required to ensure long-term reliable, safe and effective grid and network operation.	Allowed profit already takes into account the extent of investments required to ensure long-term reliable, safe and effective grid and network operation.	Allowed profit already takes into account the extent of investments required to ensure long-term reliable, safe and effective grid and network operation.
Efficiency factor	3.5% per year during the regulatory period	3.5% per year during the regulatory period	3.5% per year during the regulatory period
Allowed depreciation	Evenly distributed among the lifetime of asset. In case of intangible asset, it is set to 25% of acquisition value per year.	Evenly distributed among the lifetime of asset. In case of intangible asset, it is set to 25% of acquisition value per year.	Evenly distributed among the lifetime of asset. In case of intangible asset, it is set to 25% of acquisition value per year.
Allowed inflation (2)	[Core inflation (T-2) + Core inflation (T-1)]/2; (2012 core inflation: 1.8167%)	[Core inflation (T-2) + Core inflation (T-1)]/2; (2012 core inflation: 1.8167%)	[Core inflation (T-2) + Core inflation (T-1)]/2; (2012 core inflation: 1.8167%)
Exposure to volume risk	Yes	Yes	Yes
Investments incentive	No	Yes	No
Other incentive mechanisms	Yes	Yes	Yes

(1) Correction mechanism for period T is used in case of an underinvestment:
X = RDt-2 – PDt-2,
Where RDt-2 corresponds to real depreciation of new assets in year T-2
And PDt-2 to planned depreciation of new assets in year T-2

(2) Where:
T = year where tariff will be applicable
T-1 = current year
T-2 = previous year

Spain

Spain			
Activity	**Electricity distribution**	**Electricity transmission**	**Gas distribution**
Regulator	National Energy Commission and Ministry of Industry, Energy and Tourism	National Energy Commission and Ministry of Industry, Energy and Tourism	National Energy Commission and Ministry of Industry, Energy and Tourism
Format of regulation	Reference Network Model – Benchmarking/ Form of revenue cap	Within each period, the annual remuneration is calculated by updating the base remuneration of the previous year – in line with the CPI and IPRI – and adding the remuneration for the new investments made.	The remuneration is calculated individually for each facility, summing together the following components: ▸ Remuneration for investment ▸ Remuneration for operating and maintenance ▸ Availability and usage of the facilities ▸ Remuneration for all other costs necessary to the exercise of the activities
Regulatory period (years)	4	4	5
Regulatory periods	2009-12	2008-11	2008-12
Regulated Asset Base (RAB)	Not public	RAB is based on net asset values	RAB is based on net asset values
Allowed return (1)	Annual updated WACC for new investments	Annual updated WACC for new investments	Annual updated WACC for new investments
Allowed investment	Not a specific figure	Not a specific figure	Benchmark unit values for investment and operating and maintenance costs for regasification facilities
Efficiency factor (2) & (3)	IAn = 0.2 • (CPIn-1 - x) + 0.8 • (IPIn-1 - y)	IA = 0.15 (IPRI - x) + 0.85 (CPI - y)	Mi = M x (Vi x Ei)/Σi (Vi x Ei)
Allowed depreciation	Based on the depreciation model (not public)	Based on RAV amortization	N/A
Allowed inflation	CPI – efficiency factor	CPI and IPRI – efficiency factor	N/A
Exposure to volume risk	No	No	No
Investments incentive	No	Yes	N/A
Other incentive mechanisms	N/A	N/A	N/A

(1) The WACC used is not public.
(2) Where:
Electricity Distribution: x=80 basic points and y=40 basic points for the regulatory period 2009-12
Electricity Transmission: x=50 basic points and y=100 basic points
(3) Where:
- M: total shrinkage stuck in the transmission system (kWh).
- Mi: shrinkage stuck allocated to the transmission company "I" (kWh).
- Vi: total geomoetric volume of the transmission company "i" networks (m3).
- Ei: total gas entries in the transmission company "i" networks during the previous year (kWh).
Please see Order ITC/3128/2011, of 17 November 2011, for further information.

Sweden

Sweden		
Activity	**Electricity distribution and transmission**	**Gas distribution and transport**
Regulator	The Swedish Energy Market Inspectorate (Ei)	The Swedish Energy Market Inspectorate (Ei)
Format of regulation	Income based	Income based, ex-post
Regulatory period (years)	4	1
Regulatory periods	2012–15	N/A
Regulated Asset Base (RAB)	N/A	N/A
Allowed return	According to income cap formula and ex ante examination of the regulator	According to income cap formula and ex post examination of the regulator
Allowed investment	Companies are required to invest to ensure electricity distribution	N/A
Efficiency factor	1%	No
Allowed depreciation (1)	Based on accounting depreciation	▸ Transport and distribution cables, 40 years ▸ M/R stations, 20 years ▸ Storage space, 40 years ▸ Compressor for storage, 40 years ▸ Other machines and inventories, in accordance with accounting standards
Allowed inflation	Factor price index (FPI)	According to CPI
Exposure to volume risk	No	No
Investments incentive	Yes	No
Other incentive mechanisms	Yes	No

(1) **Note – Electricity distribution only:** the depreciation period for wires, cables and transformers in the first supervisory period 2012–15 will amount to 40 years. Today, the Ei applies a depreciation period of 12 years for electronic equipment and data systems (e.g. meters). In regard to recent developments in this area and the impact this should have on the assets economic lifespan, EI considers it justified to reduce the amortization period to 10 years.

Switzerland

Switzerland		
Activity	**Electricity distribution and transport**	**Gas distribution and transport**
Regulator	Federal Electricity Commission	Swiss Federal Office of Energy
Format of regulation	Cost plus	No regulation/ Competitive market
Regulatory period (years)	1	N/A
Regulatory periods	N/A	N/A
Regulated Asset Base (RAB)	N/A	N/A
Allowed return	WACC 2013: 3.83%	Vanilla WACC: 4.21%
Allowed investment	Companies are required to invest to ensure electricity distribution	N/A
Efficiency factor	1%	No
Allowed depreciation (1)	Linear over a fixed useful life on the residual value zero	N/A
Allowed inflation	Not yet used, most likely between 1%–1.5%	N/A
Exposure to volume risk	No	No
Investments incentive	N/A	No
Other incentive mechanisms	Yes	No

Turkey

Turkey	
Activity	**Electricity distribution**
Regulator	Energy Markets Regulatory Authority
Format of regulation	Revenue cap
Regulatory period (years)	5
Regulatory periods	2011–15
Regulated Asset Base (RAB)	N/A
Allowed return	9.35% nominal pre-tax
Allowed investment	N/A
Efficiency factor	Yes (N/C)
Allowed depreciation	The depreciation is set to 10 years
Allowed inflation	Yes (N/C)
Exposure to volume risk	N/A
Investments incentive	No
Other incentive mechanisms	Yes

The United Kingdom

The United Kingdom		
Activity	**Electricity distribution**	**Gas distribution**
Regulator	Office for gas and electricity market (OFGEM)	Office for gas and electricity market (OFGEM)
Format of regulation (3)	RPI – X (1) (price cap)	RIIO (Revenue = Incentives + Innovation + Outputs) (incentive based)
Regulatory period (years)	5	8
Regulatory periods	2010-15 (1)	2013-21
Regulated Asset Base (RAB)	Expenditure capitalized into the RAB during the regulatory period in line with OFGEM guidelines. Inflation and RAB depreciation also applied.	Expenditure capitalized into the RAB during the regulatory period in line with OFGEM guidelines. Inflation and RAB depreciation also applied.
Allowed return	4.7% pre-tax	4.2% pre-tax
Allowed investment	£14b over the regulatory period (£6.7b network investment and £7.3b network operating costs)	Average annual cost of £1.8b which equates to £14.4b over the eight year regulatory period in 2009/10 prices.
Efficiency factor	Differs for each DNO, ranges from -4.3% to +11.1%	N/A
Allowed depreciation	20 years on the RAB	(2) Pre 2002 RAV additions – 56 years Post 2002 RAV additions – 45 years
Allowed inflation	RPI	RPI
Exposure to volume risk	No	No
Investments incentive	No	No
Other incentive mechanisms	Yes	Yes

(1) From 1 April 2015, the format of regulation for Electricity Distribution will become RIIO for the next price control period which will be the eight years from 2015-23.
(2) The final proposals for GD1 cover other complications on the release of backlog depreciation and Repex capitalisation transition rates.

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