



## Regulation practice

FRONTIER ECONOMICS

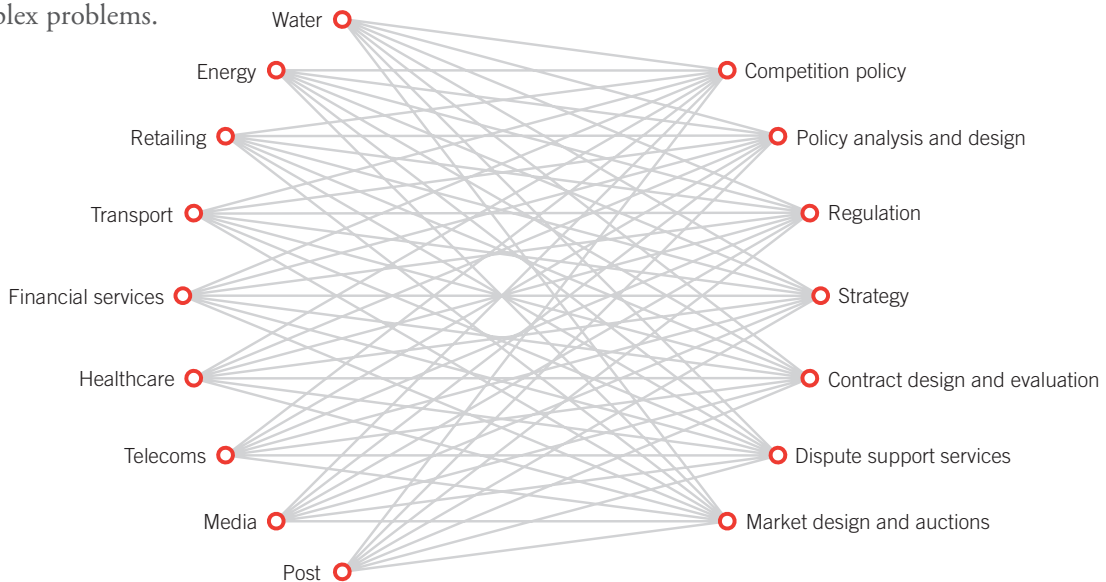


## Frontier practice areas

Frontier Economics was founded in 1999 by a team of experienced consulting economists. Our objective is to provide the highest standards in strategic, regulatory and competition policy advice for business and public policy-makers. We use advanced techniques to provide practical solutions to complex problems.

The European and Australian companies in London and Cologne, and Melbourne and Sydney, are staffed by economists used to working together for many of the largest companies and most important policy-makers around the world.

With over 50 consulting staff and associates in London and Cologne, we are one of the largest economic consulting firms in Europe. The Frontier company in Australia employs a further 15 consulting staff.





## Frontier's regulation practice

All firms face regulation of some form and, in some industries, firms are subject to explicit economic regulation. These include healthcare, pharmaceuticals, telecommunications, transport, financial services and, of course, the "utility" industries.

Regulation is a constraint on firms' strategies, and may relate to pricing or investment decisions and to quality or service provision. Regulation is thus an important consideration for positioning decisions and the identification of long-term sustainable advantages.

We see economic regulation as a package of incentives, which has to be carefully constructed in order that the signals sent to companies are sufficiently strong, while being neither contradictory nor confused. We are experienced in advising regulators on the design of regulatory mechanisms

consistent with good public policy objectives.

Frontier's expertise in regulatory policy provides it with a unique ability to build these considerations into corporate strategy. We understand how regulatory constraints operate and affect incentives. We work to help our clients shape the incentive regime and then devise strategies that maximise performance within regulatory constraints.

Frontier has an outstanding reputation in the field of regulatory economics – we have advised governments, regulators and companies around the world; and we have shaped regulatory policy, both through our client work and through the extensive published work of our staff.

The services we offer, and how we approach them, are outlined in the following pages. We are highly experienced in:

- regulatory design;
- price reviews;
- efficiency analysis and benchmarking;
- finance and financial modelling;
- network access and pricing;
- tariff and pricing strategy; and
- competition policy and dispute support.

### CONTACTS

Dan Elliott, Director  
dan.elliott@frontier-economics.com

Phil Burns, Director  
phil.burns@frontier-economics.com

Frontier Economics Ltd  
71 High Holborn  
London  
WC1V 6DA  
UK

## Regulatory design

At its core, a regulatory regime is a package of incentives, which should stimulate a strategic response from businesses in respect of cost management, product offering, pricing and investment decisions. This package needs to be constructed carefully in order to reconcile different public policy objectives. A “one size fits all” approach is bound to fail, and Frontier’s approach is to undertake careful analysis of the market place, industry structure and policy objectives before advising regime designers or regulated companies.

For example, the regulator of a monopoly business faces the task of balancing the provision of long-term profit incentives to improve efficiency against the shorter-term desire to allow customers to benefit from those efficiency gains in lower prices or better services. When a number of monopoly businesses co-exist in a sector, the task can be eased by application of yardstick competition, but such a regime needs to be supported by detailed empirical analysis of costs.

The regulatory challenge is increased if the businesses also operate in closely-related competitive markets, or if regulation is only intended to last until competition establishes itself. In these cases, it is important to ensure the rules do not distort the development of efficient competition.

The members of Frontier’s regulation practice have played an influential role in the design of many regulatory systems.

### Examples of our practice team’s experience

- Advising **Ofgem** on the framework for setting monopoly price controls (2003).
- For the **telecommunications regulatory authority of the Bahamas** on the development of an appropriate price cap for regulating retail tariffs, including the development of recommendations on rebalancing (2003).
- As the main economic adviser to the UK’s new postal regulator, **Postcomm**, we have been assisting with the development of a framework for evaluating licence applications in the light of the regulator’s obligation to ensure a universal service at a uniform price, and its primary duty to introduce competition (2001-03).
- For a major European regulator on the appropriate regulatory strategy to establish a competitive broadband internet market (2003)
- We were asked by the **National Audit Office** in the UK to assess the efficiency properties of price-cap regulation as applied by three sector regulators – Ofgem, Ofwat and Oftel – and to suggest improvements. Topics covered included incentives for investment, yardstick competition, quality regulation and innovative financing structures (2001).
- We advised the **Dutch energy regulator** at every stage of the first electricity transmission and distribution price control review. Our work included efficiency analysis, regulatory asset valuation, the determination of allowable revenue, the design of the price control formula and the development of an explicit yardstick competition regime (1999-2000).

## Price reviews

There are few things more fundamental to a business than the price it can charge for its products, yet many businesses continue to remain passive during regulatory proceedings, accepting the outcome of a price review process as something they cannot influence. For a business whose core activities are regulated, a corporate strategy is meaningless unless there is a regulatory strategy that is integrated and consistent with it.

Our most successful assignments for regulated companies facing price control reviews have been those in which our people have been brought in early and fully integrated into the company's regulatory team. We provide rigorous economic thinking and a creative external perspective to assist the company to define its strategy.

Having helped the company establish the strategic direction for the review, we then support it in undertaking the detailed analysis that is required - efficient incentive design, the form of the price control, cost of capital estimation, asset valuation, efficiency and productivity analysis and investment appraisal. Finally, we support the business in presenting its arguments to the regulator.

Our expertise is based on a thorough understanding of regulatory theory and the ability to apply financial and statistical analysis to issues of profitability, risk, costs and efficiency. Our experience is global, and covers every major regulated industry.

- Advising **Aer Lingus** on the preparation of its responses to the Commission for Aviation Regulation's proposals for the regulation of Dublin, Shannon and Cork Airports. (2001-04).
- For **E-Control**, we advised on setting price controls for the Austrian electricity distribution companies (2003).
- We assisted **Manchester Airport** with its submissions to the Competition Commission inquiry into airport charges in 2002.
- We are one of the leading advisers to the UK water industry and have assisted many water companies with their regulatory submissions to Ofwat at successive price reviews. Our team has also advised two water companies on the appeal against their price determination to the Competition Commission (1999-2004).
- We advised the Dutch energy regulator, **DTe**, at every stage of the price control determination for the electricity network and supply companies (1999-2000).
- We acted as economic advisers to **Eastern Electricity** during the last price review. Our role was to support the client on all aspects of its submissions. This assignment ended with a favorable regulatory settlement and the development of new regulatory initiatives by Ofgem that are consistent with Eastern's incentive-based regulatory strategy (1999).

## Efficiency analysis and benchmarking

Comparative efficiency analysis and benchmarking are central to effective price regulation and are increasingly being used by regulators to inform their decisions. Although the mathematical techniques can appear obscure, benchmarking is simply a technique for comparing the value for money offered by different operators.

Regulators can use this information merely to inform their price control decisions, or explicitly to determine the price control set for companies within a formal yardstick competition regime. If each individual firm's prices are set according to an industry-based yardstick, then the regional monopolies in an industry compete against each others' cost performance, rather than the expectations of the regulator, and this improves incentives, reduces the prospects of regulatory gaming and transfers larger efficiency gains to customers. Regulators are increasingly seeing the attractions of this approach. So too, are commercially-orientated regulated businesses, which see such a regime as an opportunity to earn excess returns by beating the efficiency performance of their peers for a lengthy period.

We have conducted numerous benchmarking studies in the electricity and water sectors, assessing companies' costs relative to their competitors; Frontier's consultants have often assisted companies in the preparation of studies that have provided detailed critiques of the comparative efficiency work carried out by industry regulators. The tools we have developed, along with a well-established process for carrying out the benchmarking analysis, have been applied in many sectors in Europe and other parts of the world.

### Examples of our practice team's experience

- We advised Northern European electricity regulators on the approaches that could be adopted to determine the relative efficiency of transmission system operators and how this analysis might inform regulatory policy (2002).
- We have provided on-going support to UK, Dutch, German and Polish electricity distribution companies, helping them to develop models based on data envelopment analysis and econometric techniques (1999-2002).
- We have undertaken many assignments for UK water and sewerage companies to assess relative efficiency in the UK industry. These have been based on data envelopment analysis and econometric techniques (1999-2003).
- Our advice to the UK's postal regulator, **Postcomm**, has included the provision of a range of reasonable productivity improvement benchmarks for the Royal Mail. These have been based on a review of productivity performance in the economy as a whole, regulated utility sectors, other similar sectors and the past performance of the Royal Mail (2001).

## Finance and financial modelling

Price-cap regulation requires the application of several aspects of finance theory, as well as the ability to create detailed financial models.

Estimates of the cost of capital, usually assessed using the Capital Asset Pricing Model (CAPM), are required to determine the returns that an efficient company should be able to earn on its regulatory asset base.

Frontier has advised numerous companies on the estimation of the general parameters that go into the CAPM formula, as well as company-specific adjustments.

Frontier's staff has also been instrumental in developing a series of regulatory financial models that pull together the elements of the regulatory framework to arrive at the final price cap.

### Examples of our practice team's experience

- During a series of price reviews, we have advised companies in the water, telecoms and energy sectors on a wide range of issues relating to the cost of capital. These include the cost of equity and debt, the optimal capital structure, a premium for small companies and the treatment of taxation.
- We assisted a European transmission system operator with the development of a strategic tool to integrate power system modelling with a regulatory and financial model, in order to identify optimal investment decisions (2002).
- We designed a new regulatory model for UK water and sewerage companies to monitor outcomes against the regulator's forecasts in the period 2000-04 and assess the consequences for the next Periodic Review.
- For the **Irish Commission for Aviation Regulation**, we were asked to create a regulatory financial model to assist the commission with the setting of price caps for aviation terminal services charges, levied on airlines by the Irish air traffic control body (2002).
- We have advised UK utilities on the impact on the regulated cost of capital of a highly geared financial structure: the "thin equity" model or entirely debt-financed model that has been adopted in a number of sectors (2001).

## Network access and pricing

Within the regulatory framework, detailed commercial and technical conditions of network access are a key concern where competition is being encouraged over a network provided by a monopoly supplier.

This concern is particularly strong where, for example, the network operator is vertically integrated and also involved in supplying competitive services, as sometimes occurs in electricity and telecommunications, and would also occur in the fledgling competitive markets envisaged for the UK water industry.

Incorrect network access pricing can create perverse incentives for inefficient system use. For example, electricity transmission pricing regimes that do not reflect load flows can lead to locational decisions or within-day generation patterns which create transmission costs for all users. Increasingly, network operators and regulators also need to ensure that access pricing and balancing rules are consistent with UK and EU competition law.

Frontier provides a specialist knowledge of network pricing theory and has a long track record of helping companies and regulators to apply this theory to a range of sectors.

### Examples of our practice team's experience

- We have advised several energy companies and regulators, throughout the world, on access pricing regimes for electricity and gas networks and gas storage facilities. Our work has included advice on qualitative conditions of network access, such as provisions for energy balancing, as well as pricing systems (1999-2003).
- We provided the UK water industry with research on the economic and regulatory implications of the introduction of common carriage into the water industry. We have also assisted a number of companies with the development of their access codes for use of the pipe network and their access charging regimes (2000-02).
- We completed a review of alternative approaches to setting charges for access in a European postal system, and the economic principles that support them. Our assessment took into account the specific characteristics of the national postal service provider and the industry as a whole (2002).
- We helped the UK postal regulator, **Postcomm**, to develop an access code to Consignia's network, requiring LRIC calculation, price determination and financial modelling (2001).
- We advised a group of major gas traders on the design of reformed network access rules for the German gas industry (2001).
- Frontier advised **LINK**, the network of automated teller machines, on its application for Competition Act exemption, on regulatory strategy, and on the determination of interchange fees, membership and governance rules. The issue of network access (and pricing) was a key element of this work and the OFT granted an unconditional exemption under Chapter I of the Competition Act (1999-2000).

## Tariff and pricing strategy

Regulators must not only calculate the appropriate level of costs that the company is permitted to recover, but also establish how the company recovers those costs through its tariffs. There are a number of instruments available, such as revenue caps or price caps or hybrids. In the airline industry, the revenue recovery mechanism may be set across both aeronautical and non-aeronautical services (single-till regulation), or separated into dual-till regulation. In other industries, such as the electricity industry, a range of price regulations can apply across a set of activities that are either substitutes for, or complements to one another.

The precise form of control has significant implications for the pricing decisions of the company across its range of products. Tariff rebalancing within the regulatory constraint can add significant value, and the appropriate pricing strategy differs under each type of regulatory control.

We regularly help clients with submissions to regulatory authorities, often as part of price reviews. We also help clients with the strategic design of tariffs, based on a desire to maximise profits whilst avoiding regulatory intervention. Our expertise is based on our knowledge of regulatory economics and our skills in the application of econometric and financial tools.

### Examples of our practice team's experience

- For a major mobile operator, our work focused on the optimal mark-ups that mobile phone operators should be allowed on calls, in order to recover their fixed and common costs. This work involved econometric estimates of price elasticities and sophisticated modelling of prices (using Ramsey pricing techniques), taking into account network externality effects (2002-03).
- We have assisted several airports, airlines and regulators on the application of single-till and dual-till principles to the regulation of airport landing charges (2001-03).
- We assisted the **Dutch electricity regulator** with the design of the price control for the electricity network and supply businesses (1999-2000).
- Our team assisted a European municipal utility with the design of an innovative tariff policy within its regulatory constraints. The work involved analysing the regulatory rules, our client's cost structure and the likely response of its customers (2000).
- We helped two UK electricity distributors to evaluate the implications of tariff rebalancing, developing a model that linked the regulatory constraint to a variety of estimates for cost and demand elasticities, in order to develop a strategy for price setting (1999).

## Competition policy and dispute support

We consider that "regulation" and "competition" are no longer as distinct areas of applied economics as once they were. In the UK in particular, the days when there were natural monopolies regulated in isolation from general competition policy are long gone. Sector regulators have concurrent powers under the Competition Act that enable them (and force companies) to consider traditional regulatory questions in the same terms as those used in merger or other competition cases. Increasingly, customers of regulated monopolies are resorting to litigation under UK and EU competition law. Disputes that would previously have been dealt with by an appeal to the regulator may instead be resolved by courts or through other dispute resolution mechanisms.

Frontier Economics has a thriving competition and litigation practice with extensive experience in all major areas of competition policy and analysis including:

- market definition and market power;
- merger analysis;
- abuse of market power;
- vertical agreements;
- horizontal agreements; and
- state aid.

Frontier combines expertise in network economics, in competition policy, and in applying economics in litigation and more general dispute support across a wide range of industries.

### Examples of work by Frontier Economics

Most assignments in this area are confidential, but Frontier has recently:

- Advised on litigation over the competitive effects of alternative wholesale electricity market settlement rules (2002).
- Advised a major UK power producer in a dispute over a Power Purchase Agreement (2001-02).
- Advised an energy network business on market definition for competition in new connections (2001).
- Provided economic analysis to assist the defence against a legal challenge to network access auctions (2001).
- Assisted in investigation of the market power implications of the mergers between Preussen Elektra and Bayernwerk and RWE and VEW (2000).
- Assisted a competition authority in assessing in assessing the scope of market power that might exist in the provision of various services at a major international airport (2000).



## Senior members of the Frontier Economics regulation practice

### Dan Elliott

**DIRECTOR**

Dan Elliott has over 15 years experience as a consulting economist. He is an expert in the field of utility regulation, in particular focussing on the telecommunications, water and transport sectors. Dan has worked extensively on competition policy and regulatory issues relating to retail and wholesale pricing in telecommunications throughout Europe. He has acted as adviser on regulation to virtually every water company in the UK, as well as to OFWAT and the Environment Agency. He has also recently had a significant involvement in the regulatory reviews of airport and air traffic control charges in the UK and the Republic of Ireland.

### Phil Burns

**DIRECTOR**

Phil specialises in the regulatory, strategic and market design issues arising in the energy, transport and postal sectors. He is an expert on utility regulation, and has shaped regulatory policy through his published work and through his work with regulators and companies over the past ten years. He currently serves on the panel of advisers to the Dutch energy regulator and the postal regulator in the UK and advises a number of major European energy and postal businesses on their regulatory strategy.

### Dr George Houpis

**DIRECTOR**

George joined Frontier Economics in September 2001. Prior to joining Frontier, George was a Director in KPMG's strategy group where he was responsible for the regulatory work in the telecoms and postal sectors. Whilst in KPMG, George was involved in a number of projects dealing with institutional reform, the theory and application of regulation and competition policy, market research and forecasting of demand and tariffs in the telecoms, postal, media and other sectors. Since joining Frontier, Dr Houpis has been involved with Frontier's regulatory work in the postal and telecommunications areas.



## Wynne Jones

**DIRECTOR**

Wynne Jones joined Frontier in January 2003 as a Director working primarily in Energy. Prior to joining Frontier Wynne was the partner in PWC responsible for leading its utilities consultancy practice in the UK and Europe. His work has been predominantly in regulation, competition and strategy working for a wide variety of utilities, regulators and Governments. He has recently worked extensively on energy sector auctions, where he has, for example, been the lead adviser to EDF in the development of its capacity release auction.



## Dr Christoph Riechmann

**DIRECTOR**

Christoph has particular expertise in electricity price regulation and network access regimes for electricity and gas. Christoph spent five years at the Institute of Energy Economics at the University of Cologne, where he was involved in both consultancy and research projects. He holds a doctorate from the University of Cologne and has published widely in the field of energy economics.



## Rob Francis

**MANAGER**

Rob is an experienced project manager with over 12 years experience as a professional economist. For the past 7 years Rob has focused on regulatory economics and has worked on a wide range of issues in the water, telecoms and transport sectors. He is a specialist in regulatory finance and has advised many companies and regulators on cost of capital and financial modeling issues. Between 2000 and 2003 Rob was also a lecturer in the Economics of Regulation at City University. He is currently leading Frontier's work for a number of UK water companies, assisting in the preparation of business plans and financial modeling for the 2004 price control.



## Michael Huggins

MANAGER

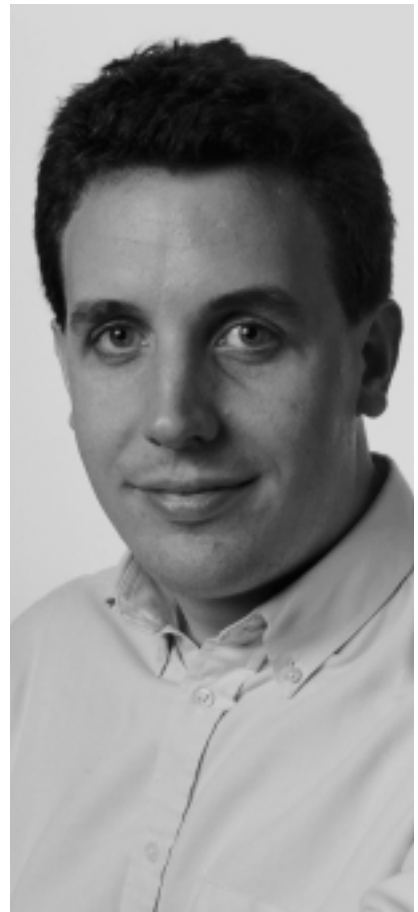
Michael has been an energy economist over the past five years, both in the private sector and in the Civil Service. His areas of expertise include dispatch and contractual modelling in wholesale markets and environmental economics. He has recently advised Ofreg in Northern Ireland on the economics of the Scottish electricity interconnector and assisted the National Audit Office with a study of the introduction of domestic competition in the UK gas industry.



## Phil Maggs

MANAGER

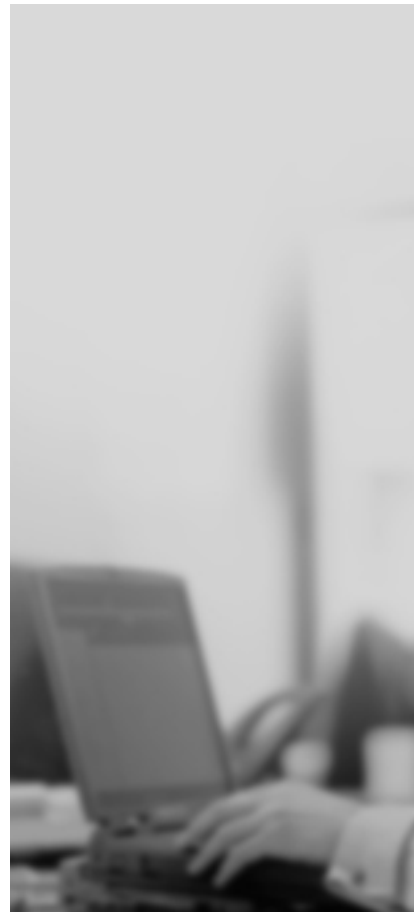
Phil is an experienced consultant who has worked on utility regulation across a number of sectors and countries. He has particular expertise in the water and transport sectors, and earlier in his career spent a period of 18 months seconded to UK utility company in the run-up to a regulatory price review. He has advised clients on a wide range of issues including cost and efficiency analysis, financial modelling, demand and resource planning, tariff design and institutional reform.



## Dan Roberts

MANAGER

Prior to joining Frontier in 2004, Dan was an Associate Partner with IBM Business Consulting Services and PwC where he worked extensively on regulatory issues primarily in the energy sector. He has advised a number of UK companies - including National Grid Company and ScottishPower - on positioning during regulatory reviews, and advised a potential buyer of gas distribution networks on key regulatory assumptions in valuation. Dan has been a long-term regulatory adviser to Bord Gáis and has advised on network regulation issues in Korea, Singapore and Panama.



## Sir Ian Byatt

SENIOR ASSOCIATE

Ian joined Frontier in 2001. Previously, he was the Director General of OFWAT, the water regulator for England and Wales. In this position he has overseen the establishment of a successful regulatory regime for the only completely privatised water and waste water industry in the world. As Director General, Ian built up and managed the regulatory office. He also worked closely with government ministers and quality regulators to meet water quality and environmental objectives, and had overall responsibility for the regulator's procurement policies. Ian also designed the system of regulatory reporting and accounting, including developing policies on the cost of capital, depreciation and capital maintenance.

## Professor Ralph Turvey

SENIOR ASSOCIATE

In his early career Ralph was Chief Economist at the UK Electricity Council. Following a spell as Chief Statistician at the ILO (International Labour Organisation) Ralph refocused his attention on utilities. He is Chairman of the Advisory Committee of the CRI (Centre for Regulated Industries), Associated Director of the London Business School 'Regulation Initiative' and a Visiting Professor of Regulation at the LSE (London School of Economics).