

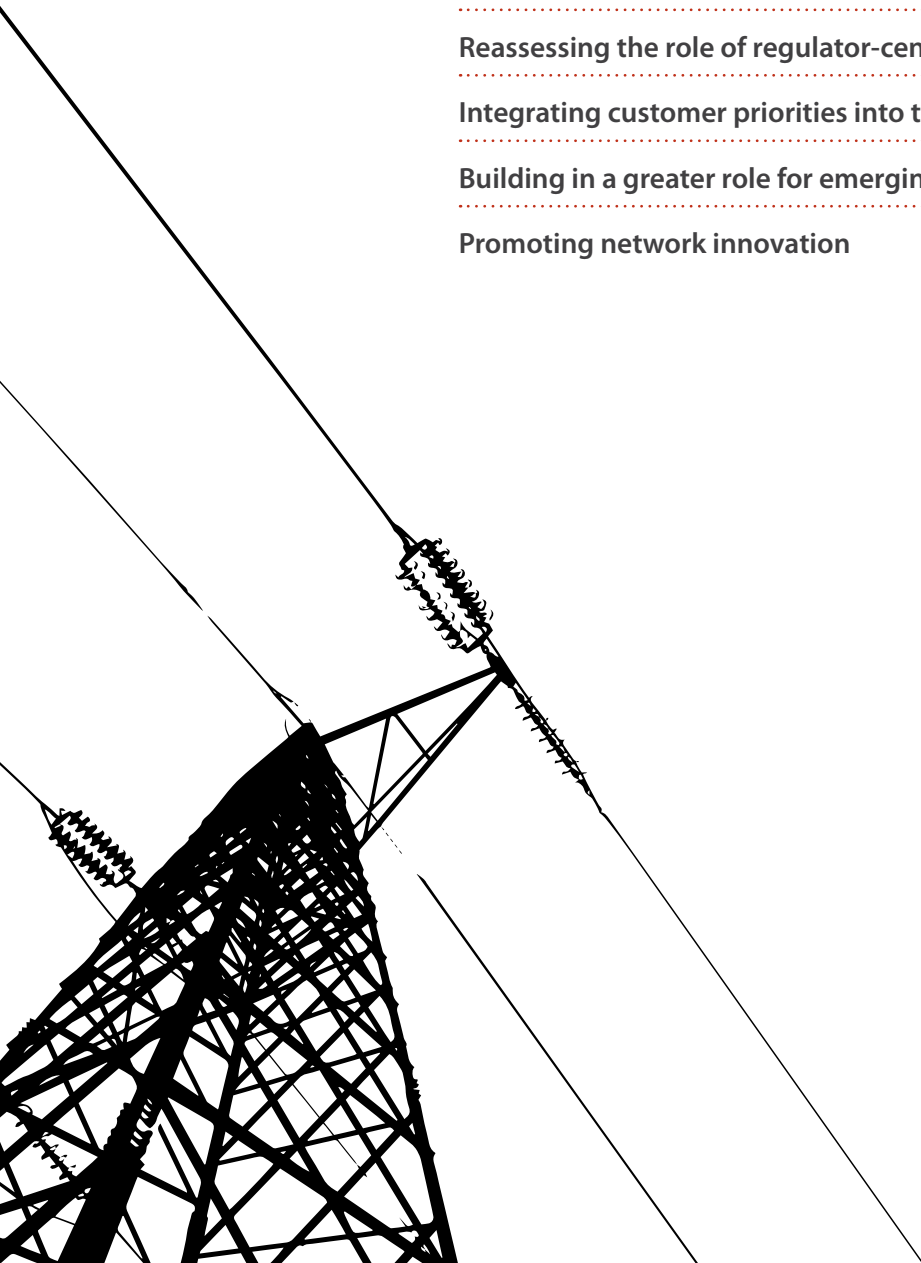


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## EVOLVING A FUTURE READY REGULATORY FRAMEWORK

## CONTENTS

EXECUTIVE SUMMARY	1
INTRODUCTION	1
KEY MARKET DEVELOPMENTS IN ENERGY DELIVERY	2
GREATER COMPETITION ACROSS THE ENERGY CHAIN	3
INSIGHTS FROM OTHER INDUSTRIES	3
AUSTRALIA'S CURRENT REGULATORY MODEL	4
POSSIBLE IMPLICATIONS FOR ECONOMIC REGULATION	5
Reassessing the role of regulator-centric frameworks	5
Integrating customer priorities into the heart of regulation	5
Building in a greater role for emerging competition	6
Promoting network innovation	7



# EVOLVING A FUTURE READY REGULATORY FRAMEWORK

## EXECUTIVE SUMMARY

**This paper indicates some potential ways in which the emerging market, technological and competitive environment facing energy networks could influence the medium-term evolution of the regulatory framework. Learning from other utility sectors and international regulatory approaches to similar issues provides insight into possible pathways for the future.**

### POSSIBLE INITIAL DIRECTIONS FOR A 'FUTURE READY' REGULATORY FRAMEWORK

- » Ensuring that as a key design principle the regulatory system provides that networks are free to deliver valued, efficient energy service solutions to each individual customer.
- » Evolving the goal of the regulatory framework towards facilitating more efficient and collaborative approaches to setting networks business and investment plans.
- » Bringing the real perspectives and priorities of consumers into the heart of the regulatory decisions, and giving them effect through regulatory decisions.
- » Allowing efficient competition to emerge, with flexible and dedicated processes to address where regulation can be removed or recalibrated.
- » Robust independent processes for evaluating the boundaries of competition and contestability which consider the full range of costs and benefits to consumers.
- » Being open to new ways to promote network innovation.

## INTRODUCTION

**The electricity market is currently entering a significant phase of intensive transformation, with changes in demand patterns, competitive conditions, technology and potential service offerings. These changes follow a long period of relative stability in the way electricity was produced, delivered and consumed.**

Key parts of Australia's economic regulatory framework covering energy networks were put in place during this period of stability, but the framework has also undergone important evolutionary changes over the past two decades. A further wave of institutional and policy reforms, including major regulatory rule revisions, are currently in the process of implementation. This reform wave has followed on from a period of intensive review and policy focus around the regulated energy sector in the past three years.

This paper aims to look over the immediate horizon of these changes to explore the different ways that Australia's sound regulatory model might potentially adapt to the major changes affecting the consumption and delivery of energy over the next two decades.

## KEY MARKET DEVELOPMENTS IN ENERGY DELIVERY

There are a range of current market developments which are changing the way electricity customers produce and consume electricity. Energy consumers are using and interacting with the grid in new ways, and deriving new value from the services and access to energy markets that it enables.

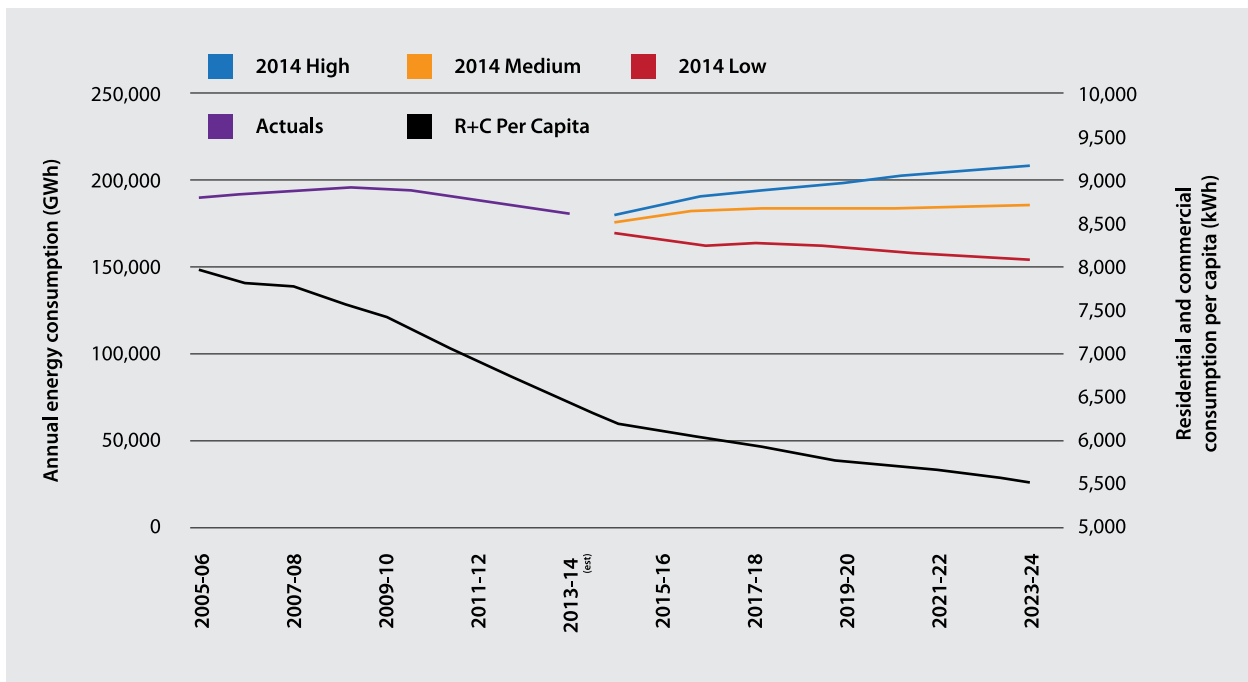
Total grid-based energy consumption across the eastern Australian market reached 200,000 gigawatt hours in 2009-10 and has been declining since (See *Figure 1*).<sup>1</sup> These falls are a combination of a number of factors, including consumers' responding to increasing energy prices, less intensive usage of electricity in the commercial and manufacturing sectors, and the penetration of rooftop solar PV systems. They follow decades of steady year on year growth in energy consumption, built first on the mass electrification of urban and regional Australian communities, and steadily growing use of energy across household and businesses.

Technology changes, particularly falls in the costs of solar, communications and storage technologies are also bringing about changes in both the capabilities of electricity networks, and the services they can enable and deliver for consumers.

As an illustration, driven by falling costs and a range of feed in-tariff schemes the number of small scale photovoltaic units has grown from a few thousand in 2008, to approximately 1.2 million units currently. Collectively, these units have an installed capacity of around 3,200 megawatts, which is approximately the same output as Australia's largest power station at Loy Yang in Victoria. While energy storage technologies are not currently a cost-effective solution for the broad residential consumer market, rapidly falling costs and expanding scale could change this equation in the course of the next decade.

Amidst these changes, networks are well-placed to be efficient providers of a set of expanded network-related services beyond the traditional network operation functions. For example, some network businesses could establish themselves as providers of maintenance services for on-site generation and other energy solutions.

**FIGURE 1: ENERGY DEMAND AND FORECASTS (NEM)**



Source: AEMO National Electricity Forecasting Report, June 2014

1 AEMO Supply and Demand Snapshot, February 2014

## GREATER COMPETITION ACROSS THE ENERGY CHAIN

Electricity networks have been regulated almost since their inception as natural monopolies. Over time, policy and market reforms have enabled competition to be created both between electricity generators and at the level of energy retailing, providing most Australian consumers with choice of their supplier.

Previously, there was an assumption that despite this emerging competition across other sectors of the energy market, network services by their nature would always be heavily regulated to protect the interests of consumers in efficiently-priced and reliable monopoly grid services. With a new range of technologies, business models, capabilities and market players this is no longer a given. In many cases networks may increasingly face the credible risk of bypass or substitution for a number of services traditionally delivered only by a monopoly regulated network.

Emerging competition and impacts of the falling costs of new technologies are forces that act across every business sector across Australia. In response to these rapidly changing market conditions, businesses in competitive markets are in a continuous process of adjusting and evolution, constantly seeking and securing new markets, developing new products and services, and taking advantage of new technologies. In competitive markets, the beneficiaries of this process are consumers.

In regulated sectors, however, this natural market process of 'creative destruction' is impacted by the existence of an economic regulatory framework. Economic regulation (including network pricing and revenue regulation, ring-fencing obligations, licensing requirements and jurisdictional pricing restrictions) can profoundly affect the capacity for commercial firms to participate and enter these markets, the type of services they can offer, permissible pricing structures and levels, incentives for and the scope for innovation, and feasible business models.

## INSIGHTS FROM OTHER INDUSTRIES

Electricity networks are undergoing challenges that have parallels in past and present challenges faced by other regulated and network-based businesses.

Telstra's ageing copper wire network, for example, was largely built to deliver universal, economic voice services across Australia. Yet growing numbers of Australians choose to effectively bypass major parts of the copper wire network, relying exclusively on mobile or VOIP services. In 2012-13 around 21 per cent of Australian adults rely on mobile only services as their principal telecommunications service, up 18 per cent on a year on year basis.<sup>2</sup>

Similarly, Australia Post and overseas postal carriers are facing increased competition from other delivery service providers, and a long term decline in mail volumes. Increasingly these businesses are examining and proposing changes to their core services and changing regimes to respond to the decline in the overall volume of physical mail, as well as changing cost structures in response to the growth of package delivery arising from the uptake of online shopping.

From mid-2015, New Zealand Post will only be required to deliver letters three times a week. Contrast this to the competitive adaptation to changed market conditions possible in the unregulated parcel delivery market in the United States. Fed Ex has recently moved from traditional weight-based to a new dimension-based charging methodology.<sup>3</sup> This is in part responding to the continuing rapid growth of online shopping related postal packages, and the need to ensure its prices continue to be aligned with key cost drivers.

The historically highly regulated taxi industry is another sector experience challenges to its monopoly status driven by technology and innovation, with the rise of alternative car sharing and hiring services.<sup>4</sup> Similar forces are changing the market for accommodation through the rise of global businesses such as 'Airbnb'. These changes will have implications over time for the scope and nature of regulation that will continue to best promote the interests of consumers in their respective markets.

2 ACMA Communications report 2012-13.

3 Wall Street Journal, 7 May 2014

4 Slate, 'When is a Taxi Not a Taxi?', December 15, 2011.

## AUSTRALIA'S CURRENT REGULATORY MODEL

Australia's current regulatory model for electricity networks is effectively based on forms of utility regulation developed in the United Kingdom over thirty years ago. It also incorporates some features of US style 'rate of return' regulation that has a history stretching back to the early 1900s. Over time this regulatory model has evolved, for example, with the progressive introduction of a series of incentives reward and penalties schemes aimed at providing the right signals for capital and operating efficiencies in service delivery, and maintaining or enhancing service quality. This evolution continues, with recent development of new capital expenditure incentive mechanisms and potential national reliability frameworks.

Under the current regulatory approach network businesses prepare and consult on detailed regulatory proposals which include expected operating and capital costs, electricity demand, network charges and investment plans for the next five year regulatory period. These proposals are then assessed by the regulatory body for conformity with a set of **National Electricity Rules**, guidelines and models which collectively run to over 1200 pages. This process takes around two years. There are likely to be significant costs saving benefits to consumers in streamlining and improving the efficiency and data-intensity of current regulatory processes

The starting point for the current electricity regulatory model is a strong presumption of the existence of a persistent natural monopoly over network services. This has led to a principal focus of the framework being seeking to ensure regulated charges for a narrow and well-defined set of regulated services reflect efficient costs. A further critical goal has been providing a predictable cost recovery framework to provide network investors the confidence to continue to make ongoing investments in long-lived capital intensive network assets such as poles and wires.

The current regulatory model has significant strengths which are sometimes overlooked. For example, consumers are major beneficiaries of the reduced financing costs arising from a stable and predictable regulatory framework. A stable regulatory regime allows networks to raise capital and refinance large investments on favourable terms in capital markets. Due to the capital intensive nature of the grid, minimising these costs plays a key role in containing the shared cost of the network to individual consumers. By way of example, a modest 10 per cent increase to the risk premium on the debt and equity component of the required cost of capital would require an increase of over \$300 million per year to electricity network charges to Australian households. This highlights that minimising regulatory risk and inconsistency, and thereby the cost of capital required by investors, should remain a fundamental consideration for policy and rule-makers.

The existing regulatory framework does contain some degrees of flexibility which should not be ignored. For example, the regime provides networks with the capacity to seek long-regulatory periods, and the regulator the capacity to trial and experiment with small-scale incentive schemes. Yet there are also some features of the existing regulatory framework, and its application, that unintentionally limits its ability to be fully responsive to market circumstances. One example is the lack of capacity to defer depreciation on large scale network investments or bring it forward across multiple regulatory periods. Another is the currently heavily volume-based tariff structures. Both of these significantly constrain networks ability to apply normal commercial options to manage evolving demand and technology-related risks.

## POSSIBLE IMPLICATIONS FOR ECONOMIC REGULATION

The transforming shape, demand patterns and capability of energy markets represent an opportunity to evolve regulation to better meet the actual needs of individual consumers.

### REASSESSING THE ROLE OF REGULATOR-CENTRIC FRAMEWORKS

Unless modified, the traditional model of network regulation actually places the regulator between a network business and its primary customers. Traditionally the core service capability of the grid was seen as delivering one way volume flow of electricity and an undifferentiated product. The basic physical characteristics of electricity networks means that many customers are likely to always share some common service elements and experiences. Under these constraints, the regulator has sometimes been represented as the 'proxy' or 'voice' for consumers through the price-setting process.

In the past, this has created controversy over whether the role of consumer advocate conflicts with the statutory role of the regulator to be a 'referee', impartially applying the rules of the framework. In addition to the potentially conflicted position it places the regulator in, the larger problem is a single regulatory body can never serve as a substitute for, or adequately reflect the varying expectations and desires of diverse groups of individual customers.

This traditional concern with regulation is exacerbated by the pressures of competition and technological evolution, which should increasingly enable the individual consumer to shape their choices around pricing and the energy services and infrastructure configuration that best serves their individual needs. Simply persisting with the current paradigm unfairly places regulators in a 'no win' situation of continuously seeking to define and refine what basket of defined regulated services an 'average' consumer desires to consume, at what price. Rather than this process, what would seem preferable is greater reliance on the normal workings of competition and choice.

### INTEGRATING CUSTOMER PRIORITIES INTO THE HEART OF REGULATION

Central to breaking out of this dilemma is better integrating the choices and preferences of consumers with key decision-making processes. Current reforms largely seek to address this by strengthening regulated businesses and regulators' obligations to consult with representatives of consumers, and through the establishment of new institutions charged with inputting consumer perspectives into existing regulatory and rule processes. There are also welcome recent policy moves towards linking customers identified willingness to pay for changes in expected reliability outcomes.

These are a positive first steps, but not the end destination. There are a variety of further ways regulation could be better designed to bring out consumers preferences, and reward companies for meeting customer needs. *Figure 2* provides a brief summary of some approaches observed internationally.

**FIGURE 2: SUMMARY OF POTENTIAL ECONOMIC REGULATORY MODELS**

Model	Description
'Building blocks' incentive regulation	Future prices are set to recover expected efficient costs, comprising a return on capital, depreciation and operating costs.
Fast-track incentive regulation	As above, but with a regulatory option which allows the regulator to streamline regulatory approval based on evidence of close consumer engagement, or due to minimal proposed changes in prices.
Price monitoring	Economic regulator tracks prices and service quality measures over time, with potential threat of direct intervention or more prescriptive regulation.
'Regulatory settlements'	Regulator facilitates direct negotiations and collaboration between regulated firm and its users, providing information and a last resort 'umpire' role if no agreement is reached.

Redesigning the regulatory process to enable networks proposals which are demonstrated to have been developed in close coordination with consumers to be ‘fast-tracked’ is one option. This is an approach being trialed in water and energy regulation in the United Kingdom by Ofwat and Ofgem. Under this model, where it is demonstrated that a network business has genuinely excelled in gathering and reflecting the priorities of its customers in its proposed forward investment and operational plans, its regulatory proposal is approved more rapidly. This allows for more rapid delivery of real consumer priorities with lower levels of regulatory compliance costs. Regulated businesses also benefit through a closer connection to their final customers and by improved certainty compared to traditionally drawn out and costly regulatory approval processes.<sup>5</sup>

An alternative approach is the ‘regulatory settlements’ approach, trialed in a large number of US state-based utility proceedings, and recently championed by the founder of UK ‘price cap’ regulation Professor Stephen Littlechild. This involves repositioning the regulator from being the monopoly decision-maker on network charges and terms and conditions to a facilitator of a transparent process of negotiations. In this model the regulator provides information, and guides parties through a process on an outcome. A variant of the same type of approach in the Scottish water sector is referred to as a ‘tramlines’ approach, with the regulator effectively establishing a set of broad boundaries within which a more collaborative settlement can emerge. So far, these ‘settlement’ type approaches have been most prevalent and successful in contexts featuring smaller and relatively homogenous customer bases. Critically, they also appear to work best in instances of small cooperative or community-owned networks, which are not a typical feature of the Australian energy market.

## **BUILDING IN A GREATER ROLE FOR EMERGING COMPETITION**

Critically, a future framework also needs to be adaptable to recognise the presence and emergence of competition in traditional monopoly services.

Market, technology and cost developments may make a range of previously monopoly delivered services increasingly contestable and competitive. Where this occurs, the regulatory framework must have the capacity to both diagnose this, and in some cases, adapt or withdraw. It also needs the ability to make transparent policy and competition assessments, well-informed by evidence about where competition and contestability is feasible, and where it has a strong prospect of promoting genuinely efficient outcomes for both individual consumers and the community at large.

Consumers generally benefit far more by allowing efficient competition to deliver innovation and choice, than by relying on regulation to replicate its outcomes. The current framework in electricity does have some existing processes at the initial stages of five yearly determination processes to require the regulator to assess the potential for competition in a range of services, through the service classification process and form of regulation factors, for example. However, it does not provide for an independent strategic assessment of whether regulation is necessary. Nor does it consider the level and form of competition and contestability which will promote efficient outcomes for consumers and what diseconomies may be created.

These questions are preconditions for sound regulatory policy. These types of processes already exist in the rules covering gas networks. The gas framework provides for both the introduction of lighter-handed forms of non-pricing regulation (including negotiation and arbitration) but also offers avenues to remove regulatory controls altogether where they are judged not to be required in order to promote the long-term interests of consumers.

A more robust ‘future ready’ framework in electricity would likely feature more flexible and clearer pathways to lighter-handed forms of regulation. It may also include increased emphasis on price monitoring or removal of price controls in those circumstances where market or technology developments mean competition is able to be effective.

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<sup>5</sup> See for example, the recent Ofwat decision to qualify two water companies for ‘enhanced’ status, meaning a streamlined regulatory approval process.



## PROMOTING NETWORK INNOVATION

Regulation, particularly relatively intrusive pricing and revenue controls that form part of traditional network regulation, has the potential to discourage innovation and experimentation.

This potential has long been recognised in both the theory and design of regulatory pricing and revenue schemes, but there is no universally acknowledged solution. In some countries, longer regulatory periods, allowing firms to benefit from the rewards of innovation over a longer period, have been argued to be part of the solution.<sup>6</sup> Developing approaches which incentivise innovation in the network sector is important. Networks operate energy infrastructure assets valued at over \$100 billion, and network charges typically make up between 30-50 per cent of final energy prices. It is clear from these metrics alone that the potential magnitude of benefits to consumers from innovation across this important link in the energy delivery chain are substantial. To ensure that these benefits are captured it is critical that the interaction of competition and targeted regulation actively promotes innovation. A framework which simply assumes innovation is only likely to be valuable if it occurs outside of the network business represents a potentially significant missed opportunity for consumers.

One possible approach is to set aside a pre-approved 'bucket' of innovation funding to be used or foregone, and paid for upfront by consumers. This is obviously a second best solution, because it implies the regulatory process will deliver the 'right' level of innovation funding, and assist in directing it to the 'right' projects. It also makes innovation - which is a highly uncertain and context-specific business process - a 'pre-paid' cost to consumers. This in turn risks subtly altering the nature of innovations pursued, discounting higher risk experimentation with potentially significant societal pay-offs.

One model recently employed by the UK energy regulator in the electricity transmission sector is the offering of an 'innovation prize'. Under this model, a competition is held for a reward of up to £27 million pounds (\$AUD 48 million) with independent industry experts responsible for recommending rewards for innovations developed by the regulated business. The involvement of a wider cross-section of expertise in this process seeks to overcome some of the issues outlined above. This mechanism is one of a suite of measures developed by the UK regulatory Ofgem (which also includes a network innovation allowance and an innovation roll-out allowance).<sup>7</sup>

The issue remains, however, that innovations that consumers benefit from may not be obvious to third parties, regulators, or many market participants themselves. This is particularly the case with new products or services. In a famous econometric case study valuing the consumer benefits of the introduction of Apple-Cinnamon flavored Cheerios, MIT economist Jerry Hausman estimated the welfare gain to US consumers at over US\$60 million per year.<sup>8</sup> In an (albeit dystopian) world where the breakfast cereal market was subject to regulation, it's difficult to conceive of this type of innovation being sponsored or approved by regulators.

A further example of this is offered by the case of US airline deregulation that commenced in the late 1970s. Prior to deregulation, US airlines operated on regulator-approved routes, with strict controls on market entry, exit and fare pricing. The Civil Aeronautics Board licensed individual point-to-point routes on which a small set of airlines were eligible to operate. The regulatory controls directed industry innovation into strong competition on a range of non-regulated quality of service features, such as free in flight catering, entertainment, and frequency of service. Yet this 'regulated competition' led to fares that were beyond the reach of many average travellers. Since deregulation of the routes and fares, market entry and vigorous competition has emerged which has demonstrated that the type of service innovation promoted by the regulatory regime was not what consumers were in practice willing to pay for.

6 As an example, in the UK Ofgem's 'Regulation Innovation Incentives and Outputs' or 'RIIO' reform program has moved to an eight year regulatory period for networks with a less intensive mid-period examination and readjustment to unanticipated trends.

7 Ofgem Electricity Network Innovation Allowance Governance Document, December 2012

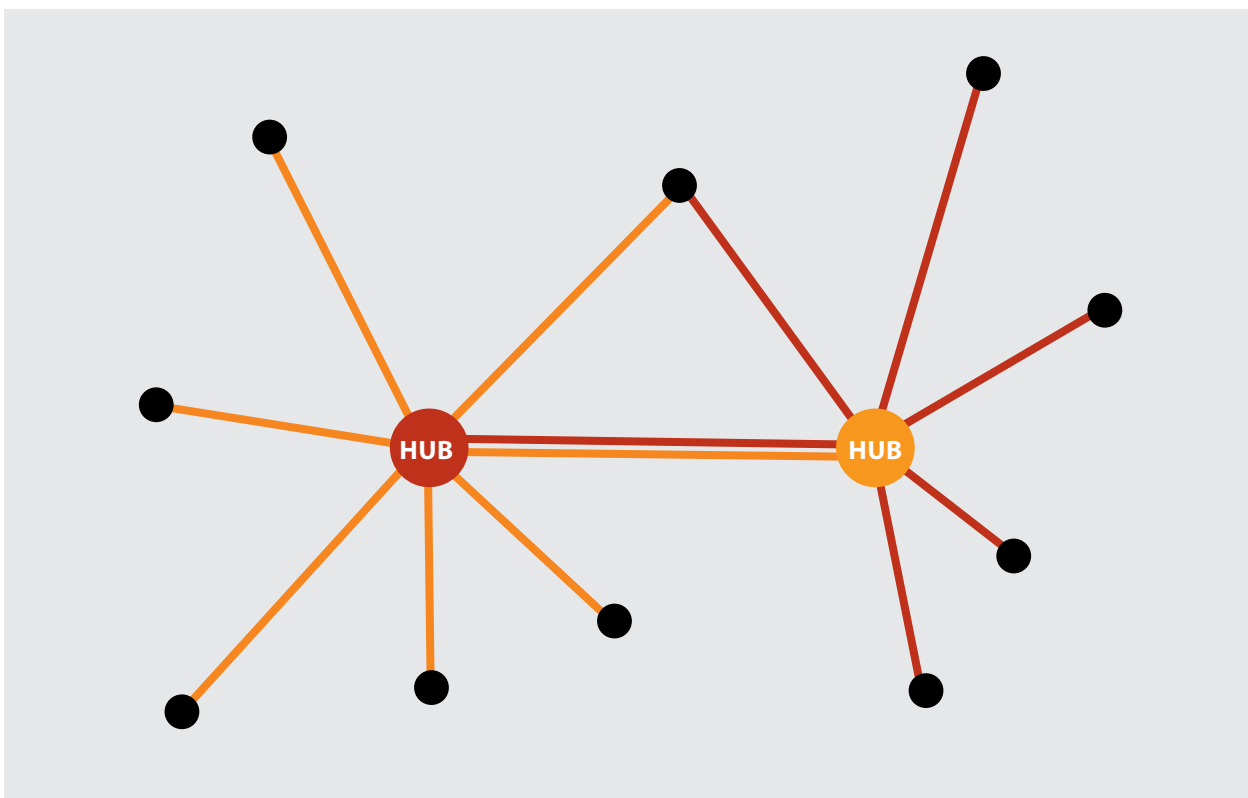
8 Hausman, J. 'Valuation of New Goods under Perfect Competition', in Bresnahan, T. and Gordon, R. (eds) *The Economics of New Goods*, University of Chicago, 1996.

In addition, the regulatory framework itself had represented an invisible and unintended barrier to the emergence of the more efficient and now widely adopted 'hub and spoke' network approach (Figure 3). The adoption of this approach delivered substantial cost savings to consumers, through increasing the efficient utilisation of airlines fleets. The impact of competition and adoption of more flexible business models, enabled by removal of unnecessary regulation, has benefited consumers substantially through lower prices and increased accessibility.

The number of US air passengers has grown from around 207 million per year in 1974 to over 800 million in 2012. In 1974 the cheapest return New-York to Los Angeles flight that regulators would allow was \$1442. In 2011, the same trip cost \$268 in real inflation adjusted dollars.<sup>9</sup>

These examples show the potential for both the form - and the well-meaning application - of regulation to real-world conditions to perversely act to stifle innovation, at significant cost to consumers.

**FIGURE 3** EXAMPLE OF A 'HUB AND SPOKE' MODEL OF AIRLINE OPERATIONS



<sup>9</sup> Businessweek *Airline Deregulation, Revisited* 20 January 2011 and US Department of Transportation.





## **FURTHER INFORMATION**

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