The Governance of Regulators

The Role of Economic Regulators in the Governance of Infrastructure



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Foreword

Infrastructure is vital for all citizens and businesses, providing essential services ranging from clean water to energy, roads and public buildings such as schools and hospitals. The governance of infrastructure supports all stages in the infrastructure lifecycle (from the identification of needs to decommission), underpinning delivery of those services. When governance arrangements fall short, this can lead to projects failing to meet their deadlines, budget, or service delivery objectives resulting in poor outcomes.

The "governance of infrastructure" is the processes, tools, and norms of interaction, decision making and monitoring used by government organisations and their counterparts to make infrastructure services available to the public and the public sector.

The OECD has developed a Framework for the Governance of Infrastructure that provides practical guidance to governments on what type of processes, tools, decision-making mechanisms and institutions are needed for effective infrastructure policy.

Economic regulators are part of an effective infrastructure governance framework. They ensure that a lack of competition for infrastructure services (usually where services are delivered by monopolies) does not result in excessive prices and poor service quality.

Economic regulators set tariffs and ensure access to not only public but also private infrastructure in a number of industries such as water, electricity and gas, telecommunications and transport.

Where economic regulators are involved in infrastructure industries, they have an ongoing relationship with the operators of regulated infrastructure throughout the infrastructure's lifecycle — from the identification of infrastructure needs, through construction and maintenance to its eventual decommissioning.

This report looks at the role of economic regulators in encouraging the efficient delivery of infrastructure services, and considers whether the approach that economic regulators take to applying tariff and access regulation has implications for the governance of infrastructure more generally.

Overall, the report finds that most economic regulators are, in fact, not directly involved in the discrete decision making that occurs in each stage of the infrastructure lifecycle — this is left to the infrastructure operator to manage. Instead, they seek to influence the behaviour of the operator as it manages the infrastructure through the lifecycle. For example, to prevent the exercise of market power, economic regulators constrain tariffs to efficient levels. While this limits the operator's budget for managing the infrastructure, it does not restrict the way the operator manages the infrastructure within this budget. Economic regulators also provide financial incentives to operators in pursuit of objectives such as improving service quality.

This report is based on a survey on the role and functions of economic regulators, completed by members of the OECD's Network of Economic Regulators (NER), representing 34 regulators from 24 member and partner countries, and covering 77 sectors and subsectors. The survey collected information from economic regulators on their role and current challenges, infrastructure needs and funding, and the infrastructure lifecycle. Beyond looking at the roles and functions of economic regulators in detail, the report examines how economic regulators are involved in the infrastructure lifecycle, the infrastructure needs of the industries they regulate, how they use data to support the delivery of their mandate, the extent to which their roles and functions have changed, the involvement of economic regulators in the policy process, and the challenges that economic regulators are currently facing in delivering their mandate.

This report is part of the OECD work programme on the governance of regulators and regulatory policy led by the OECD Network of Economic Regulators and the OECD Regulatory Policy Committee with the support of the Regulatory Policy Division of the OECD Public Governance and Territorial Development Directorate. The Directorate's mission is to help government at all levels design and implement strategic, evidence-based and innovative policies. The goal is to support countries in building better government systems and implementing policies at both national and regional level that lead to sustainable economic and social development.

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Acronyms and abbreviations

EnWG	German Energy Law
ESC	Essential Services Commission, Victoria, Australia
METI	Ministry of Economy, Trade and Industry, Japan
NER	Network of Economic Regulators
OECD	Organisation for Economic Co-operation and Development
PAFER	Performance assessment framework for economic regulators
QOS	Quality of service
SOE	State-owned enterprises
TSO	Transmission system operator

Executive summary

The "governance of infrastructure" is the processes, tools, and norms of interaction, decision making and monitoring used by government organisations and their counterparts to make infrastructure services available to the public and the public sector. Governments are often involved in the delivery of infrastructure services, from hospitals to utilities such as energy, water, communications and transport.

Economic regulators regulate both publicly and privately owned and operated infrastructure. They generally regulate natural monopoly infrastructure, where one firm can meet demand at lowest cost, but would have an incentive to levy tariffs in excess of costs. Economic regulators are responsible for setting tariffs and ensuring access to natural monopoly infrastructure. The decisions that economic regulators make also influence the overall investment environment. Economic regulators need to provide a stable investment environment to encourage efficient investment while ensuring that regulated firms provide services efficiently. However, economic regulation is not static, and regulators need to deliver stability in a context of change (technological change, disruptive technology, increasing stakeholder expectations).

Thirty-four economic regulators from 24 countries responded to an OECD survey of 77 sectors (e.g. energy, communications, transport, and water) and subsectors (e.g. electricity distribution, transmission and generation) providing information on their role and current challenges, infrastructure needs and funding, and the infrastructure lifecycle.

The survey found:

- The most common functions of the economic regulators surveyed were setting tariffs, requiring infrastructure operators to provide access to their infrastructure to third parties, monitoring, dispute resolution, and setting standards.
- The most common modalities for infrastructure delivery subject to economic regulation were privately owned operators and state owned enterprises (82 percent of delivery modalities).
- Economic regulators are well aware of the investment needs of the sectors they regulate. Over the last five years the most cited investment needs were increasing capacity to meet demand and the replacement or renewal of assets. Upgrading to new technologies and maintaining or improving service quality are also important drivers of investment.
- Most economic regulators are not directly involved in the discrete decision making that occurs in each stage of the infrastructure lifecycle — this is left to the infrastructure operator to manage. Instead, they seek to achieve the efficient delivery of infrastructure services indirectly by influencing the behaviour of the infrastructure operator.
- Economic regulators rely on data to deliver their mandate — particularly in the determination of tariffs. Around half of respondents reported collecting data on current and future investment needs. Similarly, roughly half collected information on the efficiency of infrastructure operators. Around 70% collected information on the quality of services delivered by infrastructure operators.
- Economic regulators have experienced a substantial amount of change recently, with 63% reporting that they experience a change in their role over the last five years. Generally, this change occurred when they gained additional regulatory responsibilities (e.g. regulating a new sector), or where their regulatory role changed due to technological change (e.g. in communications).
- Almost all economic regulators are involved in the policy development process and provide their views on policy. However, some noted a tension between government policy objectives and economic regulatory objectives that may have impeded the efficient delivery of infrastructure services.

- Economic regulators experienced a number of common challenges, both in promoting efficient outcomes through tariff setting (encouraging efficient investment, obtaining the right data from infrastructure operators, designing incentive mechanisms, and setting tariffs in the context of declining demand), and in operating as effective organisations (adapting to technological change, governance, co-ordination, engagement).
- The three most common challenges were encouraging efficient investment, obtaining the necessary data to perform their role and functions, and the impact of their governance arrangements on their ability to fulfil their mandate.

These findings have a number of implications for the governance of infrastructure — particularly that subject to economic regulation.

- **Given that economic regulators face such similar challenges, there seems to be scope for them to work together to address them.** A starting point for those economic regulators who faced governance challenges would be to draw on the principles of good governance for economic regulators developed by the OECD Network of Economic Regulators.
- **Flexibility can help economic regulators adapt to change.** An important part of their role is providing a stable investment environment; however, they have needed to do this in a time of substantial change, driven largely by technological change. Economic regulators need sufficient flexibility within their regulatory frameworks to account for the impact of technological change on the sectors they regulate, and therefore on their approach to regulation. A lack of flexibility could affect new business models and emerging markets.
- **The knowledge and experience of economic regulators should be used to develop and refine legislative frameworks for the regulation of infrastructure.** Economic regulators have experience in administering their regulatory frameworks over time, and also have access to sector-specific expertise. Furthermore, where there is tension between economic regulatory and policy objectives, economic regulators are well placed to ensure that policy makers have complete information about the implications of specific policy choices regarding infrastructure for market structures, competition (including the desirability of using competition as a mechanism for encouraging the efficient delivery of infrastructure services) and the need for economic regulation.

Chapter 1

Economic regulators and the governance of infrastructure

Economic regulators have been involved in administering regulation to public infrastructure for some time. This chapter explains sets out the rationale for investigating the role of economic regulators in the governance of infrastructure in light of the OECD's work in exploring the governance of public infrastructure.

Purpose

Poor governance arrangements can be detrimental to the delivery of infrastructure services. "Poor governance is major reason why infrastructure projects often fail to meet their timeframe, budget, and service delivery objectives" (OECD, 2015).

The OECD has a work program on the governance of infrastructure, and it has developed a draft framework for the public governance and delivery of infrastructure. "The ambition is to harness OECD country experience into a coherent tool that countries can apply to ensure that their infrastructure investment is effective, efficient, transparent, user-centric and affordable" (OECD, 2015).

Economic regulators (see Box 1.1) have experience in implementing regulations designed to encourage efficient delivery of services in a number of different infrastructure industries including telecommunications, transport, energy and water. This occurs over the long-term throughout the infrastructure lifecycle.

The focus of this report is to explore the role of economic regulators in relation to infrastructure, and draw out common issues and themes that are relevant to infrastructure subject to economic regulation and to governance of infrastructure generally.

Box 1.1. **What is an economic regulator?**

The OECD Best Practice Principles on the Governance of Regulators define a regulator as an entity authorised by statute to use legal tools to achieve policy objectives, imposing obligations or burdens through functions such as licensing, permitting, accrediting, approvals, inspection and enforcement. A *regulator* can use other complementary tools such as information campaigns, to achieve the policy objectives, but it is the exercise of control through legal powers that makes the integrity of their decision-making processes, and thus their governance, very important. There are a number of different types of regulators with different roles and responsibilities – among others, economic, financial, overseeing competition and/or consumer protection or setting technical standards and/or a mix of some of these roles.

This report focuses on *economic regulators* and regulators with both economic and competition/consumer protection responsibilities. Market failures have been present in a number of infrastructure industries such as in energy, telecommunications, water and transport. Economic regulators seek to address market failures and promote competition where possible. To address these market failures, Economic regulators generally seek to put in place arrangements to facilitate competition where possible, or alternatively seek to address the market failure by making decisions on price and non-price terms for the services provided by the regulated businesses.

Source: OECD (2014), *The Governance of Regulators*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264209015-en.

This report responds to a request from members of the Network of Economic Regulators (see Box 1.2) to examine the approach that economic regulators take to the governance of infrastructure.

Box 1.2. **The OECD Network of Economic Regulators**

What makes a "world-class regulator"? The OECD Network of Economic Regulators (NER) has been addressing this question through objective data, rigorous analysis and dialogue. A subsidiary body of the OECD Regulatory Policy Committee, the NER facilitates peer-to-peer learning and exchange of experience across approximately 80 regulators from OECD members and nonmembers responsible for network sectors such as communications, electricity, gas, payment services, transport and water.

The work of the NER builds on the recognition that governance matters to ensure good regulatory outcomes and the delivery of essential services to citizens. The NER has contributed to developing the 2014 OECD Best Practice Principles on the Governance of Regulators (OECD, 2014) to help regulators assess their governance arrangements and strengthen their performance. It has contributed to improving the relevance and focus of the first Product Market Regulator Survey on Regulatory Management of Network Regulators, which look at formal arrangements for independence, accountability and scope of action of regulators overseeing energy, telecommunications, rail, air transport and ports. In parallel, specific work on water has identified the governance arrangements of water regulators, based on a survey of 34 regulators. The work on formal arrangements has been complemented by an in-depth analysis of the practical arrangements for independence and accountability of regulators, informing the development of practical guidance for protecting regulators from undue influence and creating a culture of independence. The NER has also developed a Performance Assessment Framework for Economic Regulators (PAFER) for reviewing regulators' efforts towards measuring their own performance, which is being applied to a number of NER members, including regulators in Colombia, Latvia and Mexico.

Source: OECD (2014), *The Governance of Regulators*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264209015-en; OECD (2016), "The OECD Network of Economic Regulators", www.oecd.org/gov/regulatory-policy/ner.htm (accessed 22 December 2016); OECD (2016b), *Being an Independent Regulator*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264255401-en; OECD (2017), "Driving Performance of Regulators", www.oecd.org/gov/regulatory-policy/driving-performance-of-regulators.htm (accessed 24 January 2017); OECD (2017), "Independence of Regulators and Protection against Undue Influence", www.oecd.org/gov/regulatory-policy/independence-of-regulators.htm (accessed 24 January 2017).

To explore this issue this report draws on survey evidence from 34 regulators covering 77 sectors and subsectors, across a wide variety of economic regulators including energy, telecommunications, transport and water.

The report examines a number of aspects of the economic regulators' role in relation to infrastructure regulation in detail, including:

- their roles and functions
- infrastructure funding and delivery modality
- infrastructure needs
- involvement in the infrastructure lifecycle
- relationship with policy makers and involvement in policy development process, and
- the common challenges that economic regulators face in implementing their mandate.

Towards a framework for the governance of infrastructure

Infrastructure is required for the delivery of a number of different services throughout an economy. Furthermore, the services delivered using infrastructure are particularly important as they are an input to the production of other goods and services in an economy (such as electricity, transport, telecommunications, water, etc.).

The OECD has spent some time investigating the governance of infrastructure (see Box 1.3), and will soon release a framework for the governance of infrastructure. The objective of the framework is to "…harness OECD country experience into a coherent tool that countries can apply to ensure that their infrastructure investment is effective, efficient, transparent, user centric and affordable" (OECD, 2015).

While economic regulators are responsible for both private and public infrastructure, the focus of the OECD's work on the governance of infrastructure is on public infrastructure. Public infrastructure is "… facilities, structures, networks, systems, plant, property, equipment, or physical assets – and the enterprises that employ them – that meet a politically mandated, fundamental need that the market is not able to provide on its own. This definition thus ranges from the direct provision of military installations to privately-owned and operated utilities under government regulation, such as energy (OECD, 2015).

Box 1.3. **What is infrastructure governance?**

By the governance of infrastructure is meant the processes, tools, and norms of interaction, decision-making and monitoring used by governmental organisations and their counterparts with respect to making infrastructure services available to the public and the public sector. It thus relates to the interaction between government institutions internally, as well as their interaction with the public sector, users and citizens. It covers the entire life cycle of the asset, but the most resource intensive activities will typically take place in the planning and decision-making phase for most assets. More specifically it relates to the relationship between the delivery modality and the public and private sectors.

Source: OECD (2015), "Towards a Framework for the Governance of Infrastructure", https://www.oecd.org/gov/budgeting/Towards-a-Framework-for-the-Governance-of-Infrastructure.pdf (accessed 15 December 2016).

A general framework for the governance of infrastructure cuts across a number of different areas of the OECD. These areas include public-private partnerships, fiscal policy and governance across levels of government, regulatory policy, integrity and anti-corruption, budgeting and public sector innovation work (OECD, 2015).

The OECD's Towards a Framework for the Governance of Infrastructure publication (OECD, 2015) sets out a number of reasons for the OECD's focus on infrastructure governance, including:

- there has not been sufficient attention paid to infrastructure governance vis a vis the question of infrastructure financing (OECD, 2015)
- OECD analysis has found that there is a relationship between the quality of governance arrangements and regional human development outcomes, and that the efficiency and effectiveness of public investment was to improve governance arrangements (OECD, 2013)
- when governance arrangements "fall-short" this can result in poor outcomes – failing to meet their timeframe, budget, or service delivery objectives. As noted by the Australian Productivity Commission in its report on Public Infrastructure, "…institutional and governance arrangements for the provision of much of Australia's Public Infrastructure are deficient and are a major contributor to unsatisfactory outcomes. It also noted that "…we have serious doubts about whether current land use / transport planning and decision-making processes are producing the right kind of projects" (Productivity Commission, 2014).

- a more comprehensive lifecycle approach to public infrastructure could result in efficiency gains (OECD, 2015).

The link between economic regulation and the governance of infrastructure

Economic regulators continue to be an important element of the delivery of infrastructure services where competition for those services is insufficient (for example due to market failure, such as natural monopoly). As a result, governments and policy makers need to be aware of the importance of putting effective regulatory arrangements in place in infrastructure industries characterised by market failure. This should include consideration of the governance of economic regulators which contributes to the capacity of economic regulators to deliver their mandate and address these market failures.

Further, economic regulators have had a mandate to ensure the efficient provision of services for some infrastructure industries for quite some time. As a result, the approaches that economic regulators have taken to delivering their mandate over time may have a broader relevance to other aspects of infrastructure governance.

The OECD developed an initial list of governance challenges to infrastructure, and has more recently refined them (see Box 1.4) on the basis of further work and a survey of 26 OECD and partner countries. These governance challenges set out key policy questions and also include indicators for measuring performance in light of these challenges.

Box 1.4. **The ten key infrastructure governance challenges**

- Develop a strategic vision for infrastructure
- Manage the integrity and corruption threats throughout the project
- Choose how to deliver the infrastructure
- Ensure good regulatory design
- Integrate a consultation process
- Co-ordinate infrastructure policy across levels of government
- Guard affordability and value for money
- Generate, analyse and disclose useful data
- Make sure the asset performs throughout its life
- Public infrastructure needs to be resilient.

Source: OECD (2017), "Framework for the Governance of Public Infrastructure, The State of Play in Infrastructure Governance", OECD, Forthcoming.

While the experience of economic regulators is directly relevant to the fourth infrastructure governance challenge – ensure good regulatory design – because it directly relates to the experience of economic regulators, it also cuts across some of the other infrastructure governance challenges.

The "ensuring good regulatory design" challenge involves ensuring that the regulatory environment does not become an impediment to the efficient provision of infrastructure services.

Uncertainty over the "rules of the game" or in regards to revenue flows and other sources of investment funding can provide a lack of confidence about the affordability of a project for both the public and private sector (OECD 2017). Further, good governance arrangements can provide an indicator of the quality of the investment regime, where regulators are perceived as "…taking decisions on an objective, impartial, and consistent basis without conflict of interest, bias or improper influence" (OECD, 2017).

While, economic regulation seeks to encourage the efficient delivery of infrastructure services by addressing market failure, the approach that is taken to delivering this mandate is important — i.e. carrying out that mandate in a way that provides clarity of the rules of the game, and at the same time making decisions in a manner that promotes a stable investment environment that promotes efficient investment.

In terms of the other infrastructure governance challenges:

- Challenge 5: Integrate a consultation process: Stakeholder consultation is an essential part of making regulatory decisions and economic regulators have substantial experience in this area, but it is also an area which economic regulators are seeking to improve and refine.
- Challenge 8: Generate, analyse and disclose useful data: Economic regulators require access to data in order to implement their mandate. They have experience in seeking to address information asymmetry by establishing robust data collection arrangements over time.

Survey results and implications

In order to better understand the role of economic regulators in the governance of infrastructure the survey sought information and on a number of aspects of economic regulators, the infrastructure industries they regulate, and the relationship between economic regulators and the infrastructure industries that they regulate. These included:

- Roles and functions
- Infrastructure delivery mode and cost recovery
- The involvement of economic regulators in the infrastructure life-cycle
- Infrastructure needs
- How economic regulators use data in delivering their mandate
- Change and the interface between of economic regulators and the policy process
- The challenges currently facing economic regulators.

Roles and functions

Economic regulators are responsible for ensuring that the lack of sufficient competition in some infrastructure industries – such as energy, communications, transport and water – do not impede the efficient delivery of infrastructure services.

For the sectors and subsectors surveyed, the most common functions of economic regulators include regulating tariffs, access regulation, monitoring, dispute resolution, and standard setting. Some economic regulators are responsible for a single industry sector (such as rail), while other economic regulators are multi-sector regulators that have responsibilities for the economic regulation of multiple infrastructure sectors (such as electricity, gas and oil).

Infrastructure delivery mode and cost recovery

Public infrastructure has a number of different delivery modalities, including direct provision, traditional public procurement, state owned enterprises, pubic private partnerships, concessions, and privatisation with regulation.

The two most common forms of infrastructure delivery in survey responses in sectors subject to economic regulation were privatisation with regulation and state owned enterprises (SOEs).

Infrastructure subject to economic regulation is funded primarily through tariffs.

Involvement of economic regulators in the infrastructure lifecycle

Economic regulators deliver their mandate throughout the infrastructure lifecycle, from the identification of the need for the investment to decommissioning the asset at the end of its life. However, most economic regulators are not directly involved in the discrete decision making that occurs in each of the stages of the infrastructure lifecycle — this is left to the infrastructure operator to manage. Instead, they seek to achieve the efficient delivery of infrastructure services indirectly by influencing the behaviour of the infrastructure operator. For example, while an economic regulator controls prices through its tariff determinations, the infrastructure operator is the free to decide how to operate and invest in its business independent of this decision (albeit guided by the incentives and constraints in the regulator's decision).

While the majority of economic regulators did not have a direct involvement in the infrastructure lifecycle, there are some economic regulators that do have some direct involvement. The most common form of direct involvement in the infrastructure lifecycle involved reviewing long term investment plans separate from the tariffing process. For example, European energy regulators are involved in supervising the investment plans of their electricity transmission network operators with regard to the development plan for the grid in the European Union.

Infrastructure needs

As tariff setting can involve assessing funding needed to meet the investment needs of infrastructure operators, economic regulators are attuned to the most important infrastructure needs for the sectors and subsectors for which they have regulatory responsibility. In particular, over the last five years, while increasing capacity to meet demand and replacement and renewal of assets were the most commonly cited important infrastructure needs, upgrading to integrate new technologies and maintaining or improving service quality were also important investment needs.

How do economic regulators use data to deliver their mandate?

For economic regulators that are involved in tariff setting or access regulation, data on current and future investment needs, the efficiency of infrastructure operators, and quality of infrastructure services can all assist them to deliver their mandate. For the sectors and subsectors surveyed, around half of the respondents collected data on current and future investment needs. Similarly, around half of the respondents collected information on the efficiency of infrastructure operators. A greater

proportion (around 70%) of respondents collected data on the quality of infrastructure services delivered by infrastructure operators.

Further, evaluation of the efficiency of an organisation's internal processes and procedures is an important part of improving an economic performance over time. Around 70% of the respondents evaluated the efficiency and effectiveness of their internal procedures over time.

Change and the involvement of economic regulators in regulatory policy

Regulators have experienced a substantial amount of change with regard to their roles and responsibilities in the regulation of infrastructure over the last five years. In particular, around 63% of survey respondents noted that they had experienced a change over the last five years. Common sources of this change were the impact of technology change on scope of the required regulatory role in some sectors, and also new functions and responsibilities placed on economic regulators by governments.

Economic regulators have experience in administering their regulation over time, and also have specialist knowledge regarding the infrastructure sectors that they regulate. As a result, this experience can be bought to bear in the regulatory policy development process in refining and improving regulation over time. Almost all survey respondents noted that they contributed to the policy development process.

Economic regulators generally have a mandate and roles and functions set out in legislation which set out specific objectives. However, at the same time governments can have policy objectives that conflict with these objectives. The survey asked if regulators had experienced tension between government policy objectives and economic regulatory objectives for new or recently privatised infrastructure.

A number of economic regulators identified tensions between economic regulatory objectives and policy objectives. These tensions ranged from governments privatising assets without sufficient regulatory controls, investment decisions which were not economically viable and had an impact on tariffs, and decisions on market structure that reduced competition.

The challenges currently facing economic regulators

Economic regulators a variety of challenges in carrying out their role – and a number of these challenges were common to multiple economic regulators. Eleven common challenges were identified in survey responses. The top three challenges were maintaining encouraging efficient investment, data and information asymmetry and governance.

- Encouraging efficient investment was reported as a common challenge because economic regulators have a role in tariff setting, and the approach taken by economic regulators has a direct impact on incentives for the infrastructure operator to invest in a sector. Regulators were concerned about ensuring that they delivered efficient tariffs that also create incentives for efficient infrastructure investment.
- Data and information asymmetry was also reported as a common challenge. Economic regulators required information from infrastructure operators for decision making, however infrastructure operators have better information than the regulator. While economic regulators had data collection powers, some economic regulators identified challenges in obtaining the data that the needed from infrastructure operators.
- Governance encompassed a number of different issues that economic regulators felt were an impediment to delivering their mandate effectively. These issues ranged from funding, financial independence, and their powers.

Implications

A number of implications arise from the detailed investigation on the role of economic regulators regarding the governance of infrastructure:

- **Given that economic regulators face such similar challenges, there seems to be scope for them to work together to address them.** A starting point for those economic regulators who faced governance challenges would be to draw on the principles of good governance for economic regulators developed by the OECD Network of Economic Regulators.
- **Flexibility can help economic regulators adapt to change.** An important part of their role is providing a stable investment environment; however, they have needed to do this in a time of substantial change, driven largely by technological change. Economic regulators need sufficient flexibility within their regulatory frameworks to account for the impact of technological change on the sectors they regulate, and therefore on their approach to regulation. A lack of flexibility could affect new business models and emerging markets.

- **The knowledge and experience of economic regulators should be used to develop and refine legislative frameworks for the regulation of infrastructure.** Economic regulators have experience in administering their regulatory frameworks over time, and also have access to sector-specific expertise. Furthermore, where there is tension between economic regulatory and policy objectives, economic regulators are well placed to ensure that policy makers have complete information about the implications of specific policy choices regarding infrastructure for market structures, competition (including the desirability of using competition as a mechanism for encouraging the efficient delivery of infrastructure services) and the need for economic regulation.

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OECD (2016b), "The OECD Network of Economic Regulators", www.oecd.org/gov/regulatory-policy/ner.htm (accessed 22 December 2016).

OECD (2014), *The Governance of Regulators*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264209015-en.

OECD (2013), *Investing Together: Working Effectively across Levels of Government*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264197022-en.

Chapter 2

The survey results in detail

In order to better understand the role of economic regulators in the governance of infrastructure the survey sought information and on a number of aspects of economic regulators, the infrastructure industries they regulate, and the relationship between economic regulators and the infrastructure industries that they regulate. These included: roles and functions; infrastructure delivery mode and cost recovery; the involvement of economic regulators in the infrastructure life-cycle; infrastructure needs; how economic regulators use data in delivering their mandate; change and the involvement of economic regulators in the policy development process; and the challenges currently facing economic regulators.

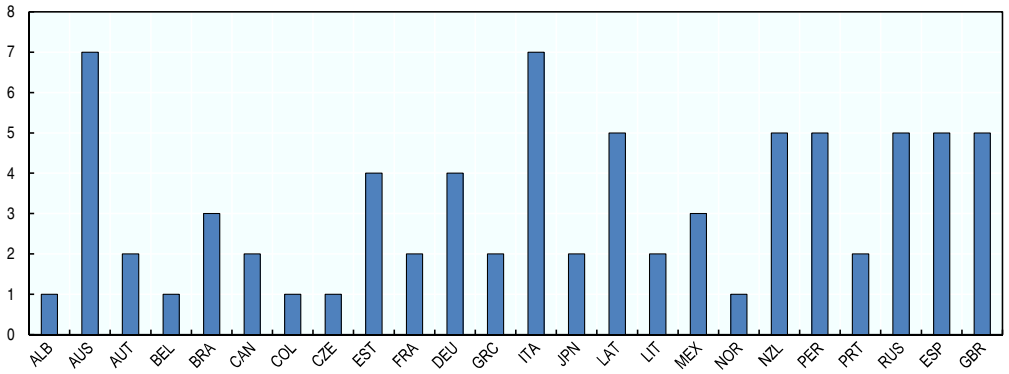
Composition of survey responses

Thirty-four responses were received from a ministry and economic regulators (for convenience, this report will refer to survey respondents as economic regulators) from 24 countries completed the infrastructure survey. Economic regulators provided responses to the survey in different ways – most provided responses by sector (i.e. electricity, gas, water, telecommunications), some provided information by subsector (i.e. electricity generation, electricity transmission, and electricity distribution), and some provided information for multiple sectors (i.e. roads, rail, and airports). In total, information was provided in responses that covered 77 sectors and subsectors.

The sectors and subsectors covered in the survey exceed the number of economic regulators because a large number of economic regulators regulate multiple sectors (for example, airports, energy, water, communications) and because some economic regulators provided information on the basis of subsectors (for example, electricity generation, electricity transmission, and electricity distribution). In light of the way data has been provided, figures in this report pool all of these different responses together.

In 6 countries, more than one regulator responded to the infrastructure survey. Respondents also included one sub-national regulator (the Essential Services Commission (ESC) of Victoria in Australia), and one Ministry (the Ministry of Trade, Economy and Industry of Japan (METI)). The number of sectors and subsectors in the survey are set out by country in Figure 2.1.

Figure 2.1. **Responses by country**

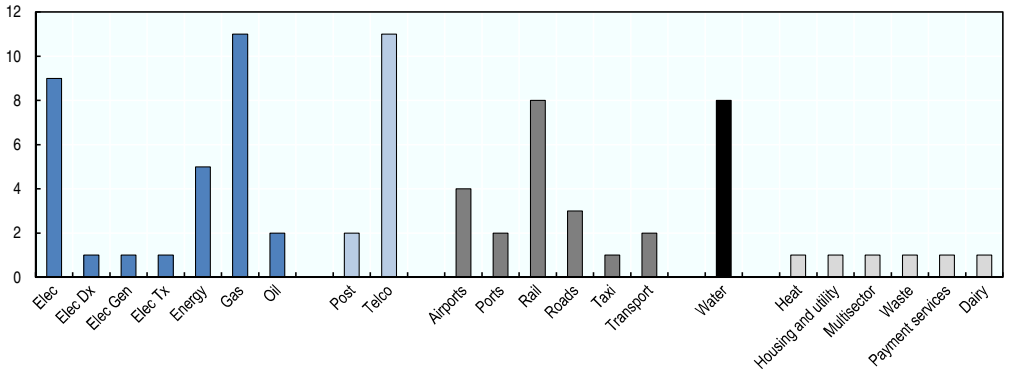


Note: This figure includes information from 77 sectors and subsectors.

Source: The Role of Regulators in the Governance of Infrastructure Survey 2016.

A large number of different regulated infrastructure industries are covered in the survey responses. Due to the large number of responses, the responses have been grouped into different industry groups. These include communications, energy, transport and water. This is illustrated in Figure 2.2.

Figure 2.2. **Sectors and subsectors**

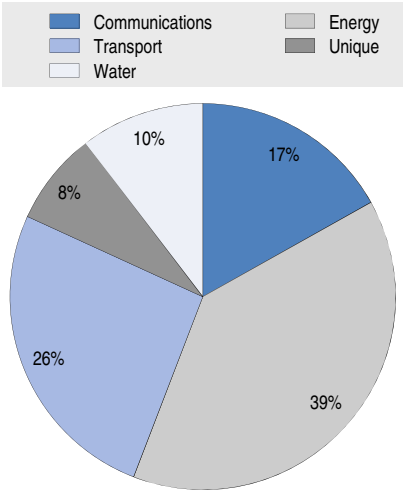


Note: This figure includes information from 71 sectors and subsectors.

Source: The Role of Regulators in the Governance of Infrastructure Survey 2016.

Figure 2.3 shows the proportion of the responses from each industry group. Not all of the responses could be allocated to an industry group, but are included in Figures in this report which relate to all sectors and subsectors.

Figure 2.3. **Industry groups**



Note: This figure includes information from 71 sectors and subsectors.

Source: The Role of Regulators in the Governance of Infrastructure Survey 2016.

As Figure 2.3 shows, energy sectors and subsectors make up the largest proportion of survey responses from economic regulators, followed by transport, communications and water.

Methodology

The *survey* was developed with inputs from members of the Network of Economic Regulators (NER). An early draft of the survey was discussed at the meeting of the NER in April 2016. The survey was circulated on 17 June 2016 to members of the Network of Economic Regulators (NER) for data collection. Responses were received up until the end of September 2016.

The survey responses have been *interpreted* in order to present some of the information received in response to the survey graphically. Some of the survey questions often contained multiple parts and as a result the responses to each of the survey questions included a substantial amount of information. The information in the responses has been reviewed, and where a number of survey responses addressed a specific issue, this information has been presented graphically. For example, the common challenges faced by economic regulators analysis was created by reviewing each of the responses, identifying the common challenges, and then collecting information on the frequency with which that issue was raised.

In some cases, the survey questions were *interpreted differently* by survey respondents. As a result, for some questions the information has been reviewed and coded in order to present consistent information graphically.

For example, while a number of economic regulators considered that tariff regulation meant that they had a role in response to each of the stages of the infrastructure lifecycle, others considered that this was an indirect role and reported no involvement. As a result, Figure 2.10 presents the extent to which economic regulators had a direct role in the infrastructure lifecycle, which has been prepared by excluding indirect roles such as tariff regulation, access regulation, general monitoring roles, and where the respondent simply received information from the infrastructure operator.

Where possible, the survey responses have been disaggregated by *sector*. However, as set out in Figure 2.2, not all survey responses could be separated by sector. Some survey responses reflect a group of sectors (electricity and gas), or were separated by sub-sector (electricity generation, electricity distribution, electricity transmission). The figures in this report pool these types of survey response together, and as a result the Figures are reflective of the sectors and subsectors regulated by the economic regulators that responded to the survey.

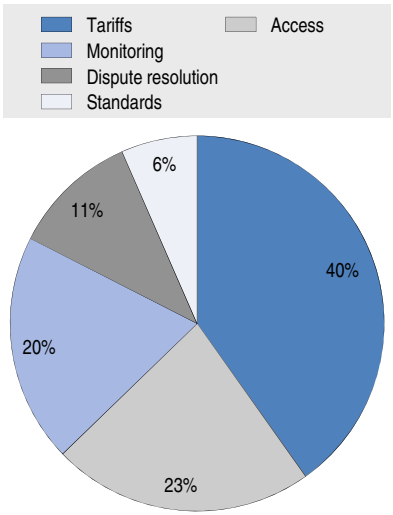
Differing amounts of information were provided in relation to each of the survey questions. This means that some survey respondents were *incomplete*, or provided answers to some parts of questions that included multiple parts. As a result, where relevant, the notes for each of the figures in this report set out the number of sectors and subsectors for which information in response to the question was provided in survey responses.

The roles and functions of economic regulators

Economic regulators are responsible for markets where there is insufficient competition and seek to ensure that efficient delivery of services in those markets. A number of infrastructure industries are subject to economic regulation because they are natural monopolies (i.e. where one firm can meet market demand at lower cost than more than one firm) and absent economic regulation, those infrastructure operators would be able to maximise their profits by exercise market power (i.e. set prices in excess of the efficient costs) resulting in insufficient service delivery at too high a price. A number of those infrastructure industries subject to economic regulation are currently or were at one stage public infrastructure provided by government.

Figure 2.4 sets out the five most common functions of economic regulators that responded to the survey.

Figure 2.4. **Five most common functions of economic regulators**



Note: This figure includes information from 71 sectors and subsectors.

Source: The Role of Regulators in the Governance of Infrastructure Survey 2016.

In order, the five most common roles and functions cited by the economic regulators that responded to the survey were:

- **Tariff regulation.** Tariff regulation involves making decisions to constrain the prices that can be levied by infrastructure operators.
- **Access regulation.** Access regulation places an obligation on an infrastructure operator to provide access to that facility to third parties and can involve the regulator being involved in setting the terms on which this access occurs (tariff and non-tariff). Additionally, some respondents that cited access regulation among their functions had a role in assessing the level of competition in markets and whether access regulation was needed.

  While tariff regulation could be considered to be a subset of access regulation (as both can involve the regulation of tariffs), they have been separated in the above Figure because some survey respondents reported being responsible for tariff regulation but not access regulation. Responses that cited both tariff setting and access regulation were separately coded.
- **Monitoring.** Economic regulators also commonly have roles in monitoring infrastructure industries. There are different rationales for monitoring. Monitoring can be to provide information (such as profitability or measures of quality of service) on the performance of an industry to government and stakeholders, to encourage competition through comparison, or as a light-handed form of regulation where there are concerns about the level of competition in an infrastructure industry where further information on the behaviour of the market participants may justify heavy-handed regulation in the future. In some instances, Economic regulators are involved in monitoring the compliance of private firms with concession contracts and public-private partnership arrangements.
- **Dispute resolution.** In some instances, economic regulators can be involved in arbitrating and resolving disputes over the tariff and non-tariff conditions on which infrastructure operators provide services.
- **Standards.** Some regulators are involved in setting technical standards in addition to conducting their economic regulatory functions. For example some water regulators are responsible for setting quality standards for drinking water.

How is infrastructure delivered and funded?

As set out in OECD (2015), there are a number of approaches that can be used to deliver pubic infrastructure, and they are set out in Box 2.1.

Box 2.1. **Modes of infrastructure delivery**

OECD (2015) defines a number of different modes of infrastructure delivery:

"Direct provision"

Direct provision of infrastructure involves the government taking responsibility for all aspects of infrastructure delivery, including financing, construction and subsequent service delivery. This mode affords the government a maximum level of control over the infrastructure asset.

Traditional public procurement

In the traditional public procurement mode, a government body contracts with private partners to provide infrastructure-based goods and services. The government will contract separately for the design, construction, operation and maintenance of infrastructure assets. Contracts are allocated using competitive tender processes in order to obtain the optimal bundle of quality features and price.

State-owned enterprises (in full or in part)

Infrastructure, particularly in network industries such as water, public transport and electricity is often provided by state-owned enterprises (SOEs) that are owned (fully or partially) by the government. The government may relinquish infrastructure investments to an SOE if the latter is able to raise finance independently, although the actual investment decision may still be subject to government controls if they have fiscal implications. This may be an efficient mechanism for the delivery of infrastructure, especially if the SOE is be "corporatized" as an independent legal entity and subjected to commercial pressures. An efficient solution further calls for the state's roles as enterprise owner and regulator to be conducted separately.

Public-private partnerships and concessions

Public-private partnerships (PPPs) involve private investors financing and managing the construction of an infrastructure asset, which they then typically operate and maintain for a long period, often extending to 20 or 30 years. In return, the private partner receives a stream of payments to cover the capital expense as well as the operating and maintenance costs. This payment stream may be derived from the national budget, user fees or a combination of the two.

Box 2.1. **Modes of infrastructure delivery** (*cont.*)

Private firms are responsible for financing, constructing and operating the infrastructure assets. Governments retain control over project selection, establish the framework conditions and retain some regulatory powers.

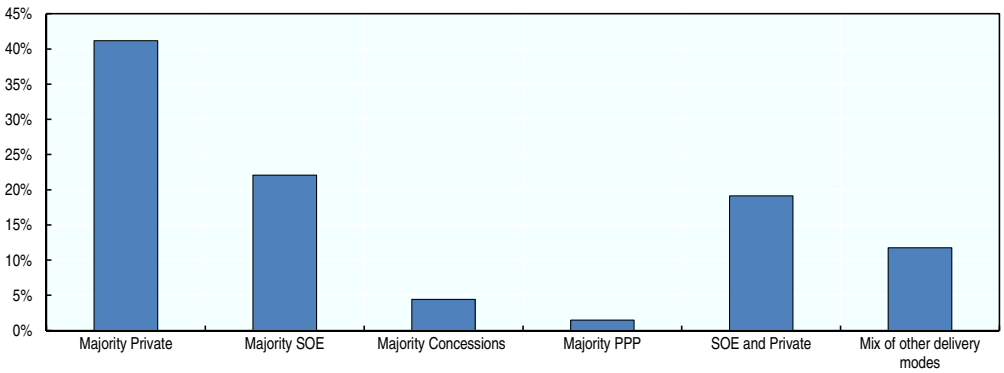
Privatisation with regulation

When conditions for a competitive market exist in a particular sector, private firms subject to the discipline of market forces may provide the most efficient mechanism for the provision of infrastructure. In this mode of infrastructure delivery, private firms are not only responsible for the financing and delivery of infrastructure, but they also make investment decisions relating to which infrastructure assets to build. There are many cases of privatisation of sectors with market failures, e.g. water and energy. When privatisation has been the preferred option, governments have in parallel strengthened regulatory oversight in the sectors at stake – this has been notably the case with the establishment of independent regulators in the energy and water sectors when systems have been privatised."

Source: OECD (2015), "Towards a Framework for the Governance of Infrastructure", OECD, Paris, https://www.oecd.org/gov/budgeting/Towards-a-Framework-for-the-Governance-of-Infrastructure.pdf (accessed 15 December 2016).

Figure 2.5 sets out methods of infrastructure delivery in survey responses.

Figure 2.5. **Infrastructure delivery modes**



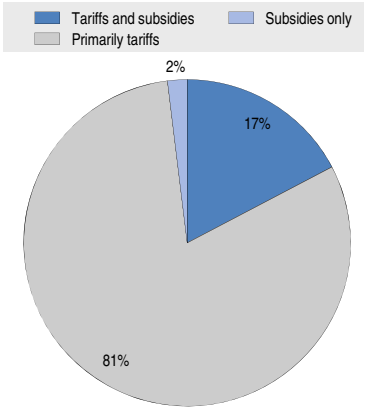
Note: This figure includes information from 68 sectors and subsectors.

Source: The Role of Regulators in the Governance of Infrastructure Survey 2016.

Figure 2.5 shows that among the five alternative forms of infrastructure delivery mode, two modes stand out – privatisation with regulation, and SOEs. Privatisation with regulation accounts for 41% of the reported delivery models, while SOEs account for 22% of the reported delivery models. The combination of privatisations with regulation and SOEs accounted for 63% of the total reported delivery modes.

Figure 2.6 shows the extent to which tariffs set by economic regulators recover the costs of infrastructure.

Figure 2.6. **Infrastructure cost recovery mechanisms**



Note: This figure includes information from 51 sectors and subsectors.

Source: The Role of Regulators in the Governance of Infrastructure Survey 2016.

In Figure 2.6, infrastructure cost recovery is separated into three groups:

- **Primarily tariffs:** where survey responses indicated that infrastructure cost recovery was between 85% and 100%. Within this category of responses are responses which indicated that tariffs recovered in excess of 95% of infrastructure costs, while also noting they had received some contributions from EU funds
- **Tariffs and subsidies:** where survey responses indicted that infrastructure cost recovery was less than 85%
- **Subsidies only:** where all infrastructure costs are borne by government.

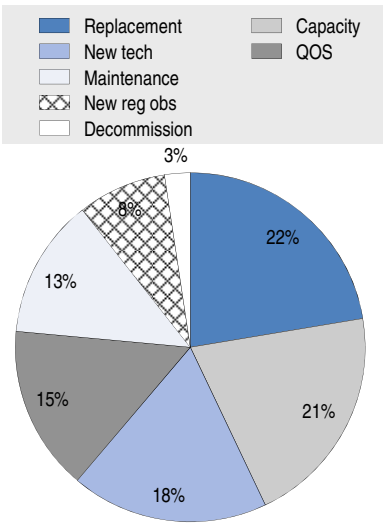
Figure 2.6 shows that tariffs are the primary mechanism of recovering the costs of infrastructure for the sectors and subsectors surveyed (81%), while tariffs and subsides were the mechanism for cost recovery in 19% of the sectors and subsectors that responded to the question.

Infrastructure needs

The survey asked economic regulators to report identify the most important infrastructure needs in their sector, in light of the following categories:

- Increase in capacity to meet demand
- Replacement / renewal
- Investment to meet new regulatory obligations (safety, environmental, etc.)
- Maintenance
- Upgrade to integrate new technologies
- Maintaining or improving service quality (QOS)
- Decommissioning.

Figure 2.7. **Most important infrastructure needs over the last five years**

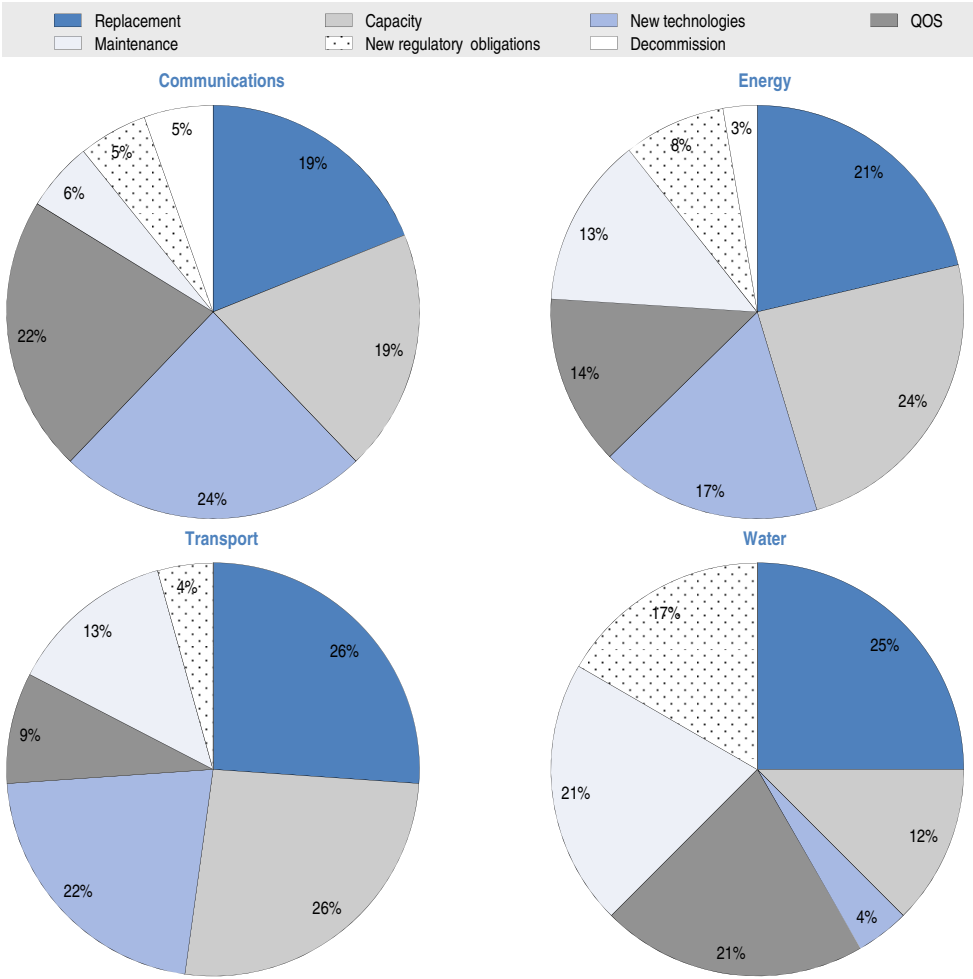


Note: This figure includes information from 63 sectors and subsectors. This figure does not include data provided on investment needs other than the pre-defined types on the survey.

Source: The Role of Regulators in the Governance of Infrastructure Survey 2016.

Figure 2.7 above sets out the most important infrastructure needs identified for sectors and subsectors subject to economic regulation over the last five years.

Figure 2.8. **Most important infrastructure needs over the last five years, by industry group**



Note: This figure includes information from 11 communications, 28 energy, 12 transport, and 8 water sectors and subsectors. This figure does not include data provided on investment needs other than the pre-defined types on the survey.

Source: The Role of Regulators in the Governance of Infrastructure Survey 2016.

In an environment with a steady policy environment and slow technology change, it could be expected that the key investment drivers would be investment to increase capacity as demand increases, and replacement as assets age over time. Interestingly, Figure 2.8 demonstrates that while capacity and replacement are important investment drivers, so too are upgrading to new technologies, and maintaining or improving service quality. In contrast, decommissioning and meeting new regulatory obligations were the least cited infrastructure needs.

Figure 2.8 above shows the most important infrastructure needs over the last five years by industry sector.

Similar to the results for all survey respondents, capacity and replacement have been important infrastructure needs over the last five years across the four industry sectors.

Interestingly in communications and transport, the capacity and replacement investment needs were of equal importance to investment to upgrade to integrate new technologies. In particular, in communications this investment need was substantially larger than the replacement and capacity investment need.

In contrast, investment to upgrade to new technologies was less important in energy and water industry sectors. In water, maintain or improving service quality was more frequently cited than increasing capacity to meet demand and was almost as frequently cited as replacement and renewal. In energy, the need to increase capacity to meet demand and replacement and renewal were the most frequently cited important infrastructure needs, with upgrading to integrate new technologies, QOS, maintenance and investment to meet new regulatory obligations all less frequently cited.

For all of the sectors, decommissioning was the least cited important infrastructure need, which was uncited in the transport and water industry groups of survey respondents. Having said that, the decommissioning of assets was cited as an important infrastructure need in the energy and communications industry groups. Reasons cited for decommissioning as an investment driver included ensuring that funds were set aside to pay for the eventual abandonment of pipeline infrastructure and the progressive shutting down of traditional access networks in telecommunications.

To what extent are economic regulators involved in the investment lifecycle?

As mentioned above, all economic regulators have an impact on the investment environment by implementing their mandate and placing constraints on the way in which infrastructure operators deliver

infrastructure services to society. Decisions about tariff levels and which services are subject to access regulation have an impact on all stages of the investment lifecycle – however, the Economic Regulator does not make decisions within these stages of the lifecycle — these decisions are left for the infrastructure operator to make during the infrastructure lifecycle within the overall constraint set by the economic regulator.

However, the mandates of some of the economic regulators who participated in the survey are sometimes broader than the economic regulatory functions of tariff and access regulation and monitoring. In some circumstances, these economic regulators have functions that a have a more direct impact on the infrastructure operator.

Drawing on OECD (2015), the survey sought information from economic regulators on their role in the infrastructure lifecycle. The six stages in the infrastructure lifecycle are set out in Figure 2.9 below.

Figure 2.9. **Six stages of the infrastructure lifecycle**



Note: This figure has been adapted from the infrastructure governance cycle presented in OECD (2015) to include an additional stage: Decommissioning.

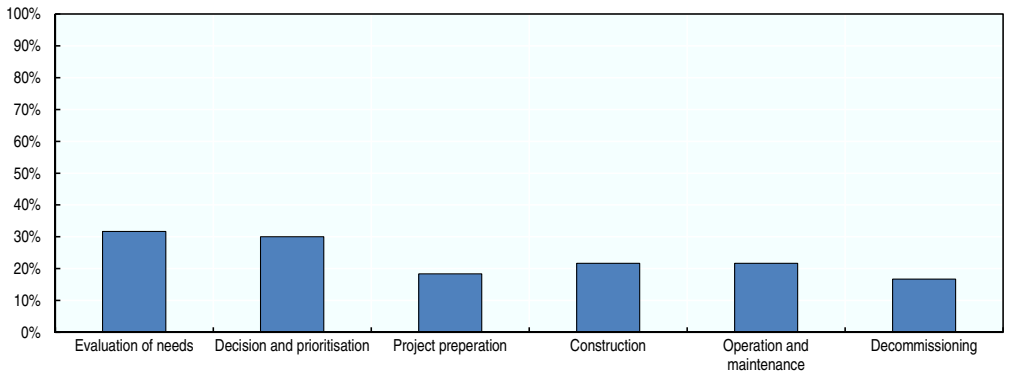
Source: OECD (2015), "Towards a Framework for the Governance of Infrastructure", https://www.oecd.org/gov/budgeting/Towards-a-Framework-for-the-Governance-of-Infrastructure.pdf (accessed 15 December 2016).

Given the indirect nature of functions exercised by economic regulators in relation to infrastructure industries, there was a degree in inconsistency in the way in which different economic regulators perceived their role when mapped against the infrastructure lifecycle. In particular, some respondents

mapped their tariff and access roles against each of the stages in the infrastructure life-cycle whereas some did not. In order to present a consistent representation of the roles of economic regulators in relation to the infrastructure lifecycle for the purposes of Figure 2.10, only direct roles were captured. In order to capture direct roles, indirect roles such as tariff regulation, access regulation, general monitoring or where the economic regulator simply receives information from the regulator have been excluded.

Figure 2.10 illustrates the extent to which economic regulators are involved in the infrastructure lifecycle.

Figure 2.10. **Direct involvement of infrastructure regulators in infrastructure lifecycle**



Note: This figure includes information from 60 sectors and subsectors.

Source: The Role of Regulators in the Governance of Infrastructure Survey 2016.

It shows that the majority of economic regulators surveyed do not have a direct role in the infrastructure lifecycle. Despite the majority of regulators having no direct involvement in the investment lifecycle, the areas of greatest direct involvement was in the "evaluation of needs" and "decision and prioritisation" and the area of the lowest direct involvement was in "decommissioning".

Economic regulators in the energy industry group were most involved in the "evaluation of needs" and "decision and prioritisation" stages of the infrastructure lifecycle. This is because a large number of energy regulators had a role in reviewing and approving the infrastructure plans of their gas and electricity transmission networks. In particular, European energy regulators are involved in supervising the investment plans of their transmission networks with regard to their alignment with the development plan for the grid in the European Union.

Box 2.2. **The role of the Bundesnetzagentur in the electricity transmission planning process**

The German multisector economic regulator, the Bundesnetzagentur has a role in the electricity transmission network planning process.

The electricity transmission system operators (TSOs) work together to draw up a draft scenario framework, which describes the anticipated developments in the fields of renewable energy sources, conventional energy sources and energy consumption and load in Germany.

The Bundesnetzagentur publishes this draft and gives the general public and downstream network operators an opportunity to express their opinions. Taking the results of this consultation phase into consideration, the Bundesnetzagentur approves the scenario framework.

With this as a basis, the TSOs then draft the Grid Development Plan and the Offshore Grid Development Plan. This plan "must contain all effective measures for the necessary optimisation, development and expansion of the network, which are required over the next ten years to ensure safe and reliable network operation," (Section 12b I 2 German Energy Law [EnWG]).

The Grid Development Plan is again published and consulted with the public, before being approved (possibly subject to alterations) by the Bundesnetzagentur. If an investment measure is included in an approved Network Development Plan, the TSOs have a legally binding obligation to implement that measure.

Further information is available at:
http://www.netzentwicklungsplan.de/en/content/process.

Source: Information provided in Bundesnetzagentur survey response.

Economic regulators in the energy industry group were also involved in the "decommissioning" stage of the investment lifecycle. While there were a diverse set of reasons for energy economic regulators being directly involved in decommissioning, a number of regulators had a direct role in ensuring that the environmental impacts were considered when assets were decommissioned.

How do economic regulators use data to support the delivery of their mandate?

The most common functions of economic regulators (tariff setting, access regulation, monitoring) all benefit substantially from the collection of data. For example, in tariff regulation, collecting data over time can be used to support decisions on the amount of investment required in the next tariff

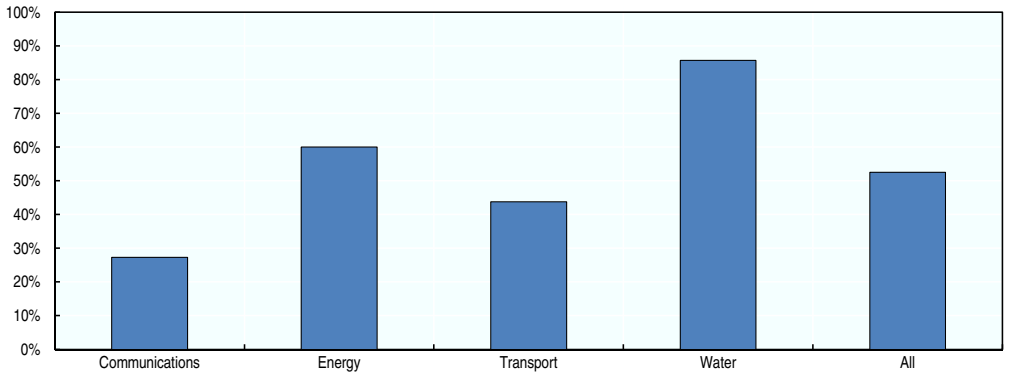
period independent from information provided by the infrastructure operator.

Where an economic regulator is responsible for regulating multiple infrastructure operators, it may be possible to collect data to enable cost comparisons and efficiency benchmarking. Further, where an economic regulator administers incentive schemes that award financial rewards or penalties designed to encourage particular behaviour (such as make efficient decisions about quality of service) robust data collection processes that are transparent and verifiable provide can provide infrastructure operators with confidence about the financial consequences of their decisions.

Current and future investment needs

Figure 2.11 shows the proportion of sectors and subsectors subject to economic regulation for which data is collected on current and future investment needs.

Figure 2.11. **Do you collect data to measure current and future investment needs (% yes)?**



Note: This figure includes information from 59 sectors and subsectors.

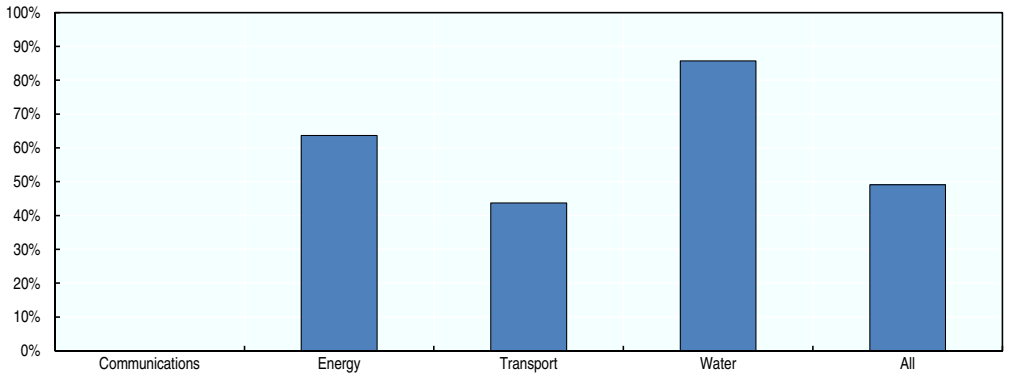
Source: The Role of Regulators in the Governance of Infrastructure Survey 2016.

Figure 2.11 shows that 53% of sectors and subsectors provided information to economic regulators to enable them to measure current and future investment needs. Across industry groups, a lower proportion of communications regulators reported collecting data on current and future investment needs compared to energy, transport and water regulators.

The efficiency of infrastructure service providers

Figure 2.12 sets out the proportion of the sectors and subsectors subject to economic regulation for which data on the efficiency of service providers is collected.

Figure 2.12. **Do you collect data to measure the efficiency of infrastructure service providers (% yes)?**



Note: This figure includes information from 55 sectors and subsectors.

Source: The Role of Regulators in the Governance of Infrastructure Survey 2016.

Figure 2.12 shows that around half of the respondents collected data in order to measure the efficiency of the infrastructure of infrastructure operators. Similar to the results for collecting data to measure investment needs, a larger proportion of energy and water regulators than communications regulators reported collecting data to measure the efficiency of infrastructure operators.

Economic regulators reported using a number of different techniques to assess efficiency, including benchmarking of specific processes, productivity measures such as total factor productivity, data envelopment analysis and stochastic frontier analysis, econometric modelling, and a number of different cost models.

Quality of service

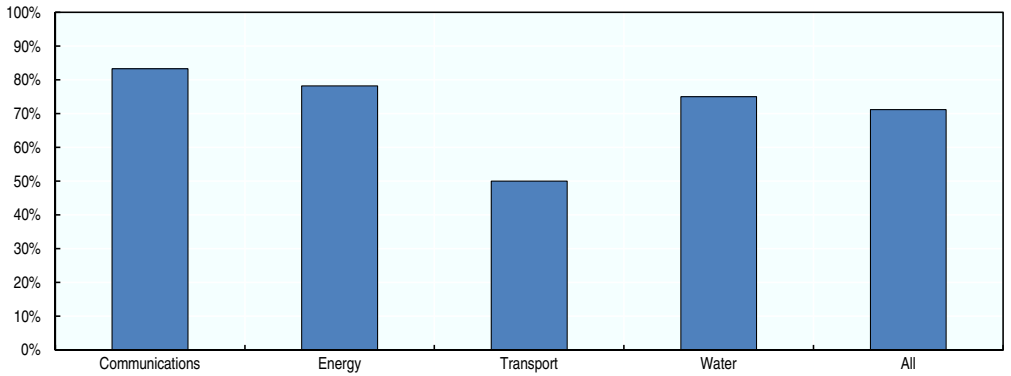
Where economic regulators are involved in tariff setting, measuring and setting incentives around quality of service is important. In the absence of quality of service measures and incentive schemes, infrastructure operators may have a greater incentive to reduce quality of service to increase their

profitability rather than making cost reductions associated with genuine efficiency gains.

Quantitative measures of quality of service differ across the regulated sectors. In energy, survey respondents reported collecting information on the duration and frequency of outages and the time to resolve faults are measured. In communications, call quality, network coverage, and broadband network quality (latency and packet loss) are collected. In transport measures include track availability, cancellations for rail networks, average delays and speed for highways. In water regulators reported collecting data on water quality and pipeline bursts.

Figure 2.13 sets out the proportion of the sectors and subsectors subject to economic regulation for which data is collected data to measure the quality of service provided by infrastructure operators.

Figure 2.13. **Do you collect data to measure quality of service (% yes)?**



Note: This figure includes information from 59 sectors and subsectors.

Source: The Role of Regulators in the Governance of Infrastructure Survey 2016

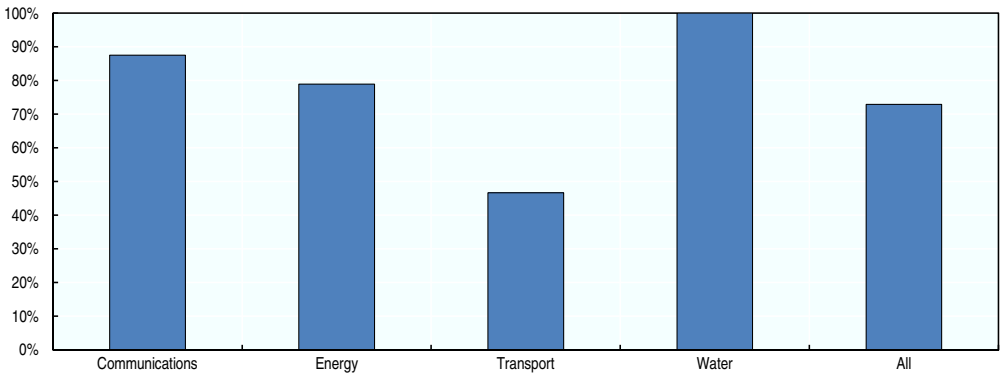
Figure 2.13 shows that quality of service data was collected for the majority of sectors and subsectors subject to economic regulation. A slightly higher proportion of survey respondents from the energy, communications, and water industry group collected quality of service data, compared to survey respondents from the transport industry group.

Evaluating the efficiency and effectiveness of internal processes and procedures with regard to the governance of infrastructure

Measuring the efficiency and effectiveness of an economic regulator's internal processes and procedures enables economic regulators to improve its operational performance over time. Figure 2.14 shows the proportion of

the sectors and subsectors subject to economic regulation for which economic regulators measure the efficiency and effectiveness of their internal processes.

Figure 2.14. **Do you evaluate the efficiency and effectiveness of your internal processes (% yes)?**



Note: This figure includes information from 48 sectors and subsectors.

Source: The Role of Regulators in the Governance of Infrastructure Survey 2016.

Figure 2.14 illustrates that the majority of survey respondents reported tracking the efficiency and effectiveness of their own internal processes and procedures.

Change and the interface between of economic regulators and the policy process

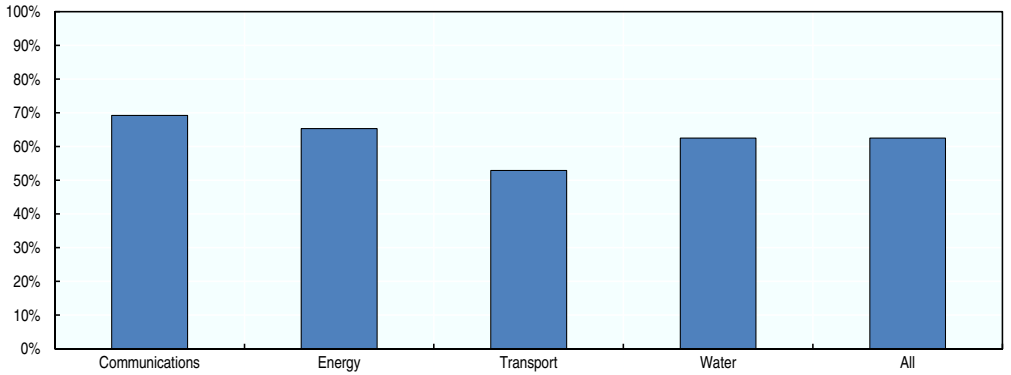
Infrastructure regulation is not static. Change comes from a number of different sources (changes in technology, government policy, stakeholder expectations, market structure and ownership, financial markets) and an important part of providing a stable investment environment is the approach that the economic regulator takes to dealing with change.

Economic regulators and change

Sources of change for the roles and functions of economic regulators include changes in government policy in relation to economic regulation (i.e. as the views and scope of the policy intervention in the sector changes), market structure, ownership and technology.

Figure 2.15 sets out the proportion of economic regulators that experienced change in their roles and functions over the last five years.

Figure 2.15. **Have you experienced a change in your roles and responsibilities with regard to the governance of infrastructure over the last five years (% yes)?**



Note: This figure includes information from 64 sectors and subsectors.

Source: The Role of Regulators in the Governance of Infrastructure Survey 2016.

Figure 2.15 shows that 63% of economic regulators experienced a change in their role and functions over the last five years.

Changes in the roles and functions of economic regulators can involve regulating additional infrastructure, changes in the way in which infrastructure is regulated, and additional responsibilities (for example, an economic regulator being required to set technical standards in addition to regulating tariffs).

Involvement of economic regulators in the policy process

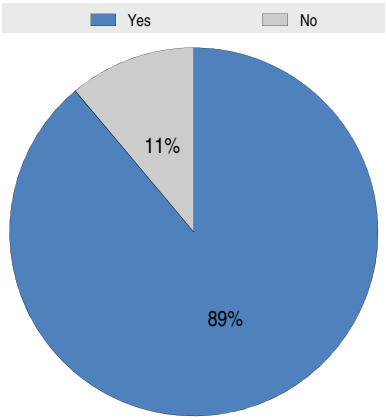
While there are some mechanisms that regulators administer that can influence the scope of their scope and functions (for example, some economic regulators can made decisions about the need and scope of access regulation as competition in an industry changes), changes in economic regulators' roles and functions can also originate from government or an independent rule making body. Additionally, in some circumstances, an economic regulator may encounter an issue that the framework within which it operates is unable to address.

As a result, it can be important for economic regulators to participate in the policy process. Economic regulators can assist the economic regulatory policy process by providing policy makers with access to their industry knowledge and technical expertise that may not be within government. The

independent status of economic regulators puts them in the unique position to be able to provide advice on specific policy in line with their overarching mandate.

Figure 2.16 illustrates the extent to which economic regulators are involved in the regulatory policy development process.

Figure 2.16. **Involvement in the policy process (% yes)?**



Note: This figure includes information from 27 sectors and subsectors respectively.

Source: The Role of Regulators in the Governance of Infrastructure Survey 2016.

While the number of sectors and subsectors that responded to these survey questions was substantially smaller than for the other questions in the survey, Figure 2.27 shows that while most economic regulators the majority of economic regulators contribute to the regulatory policy process.

Tension between policy and economic regulatory objectives

As identified in OECD 2016, one of the reasons for establishing separate bodies to administer infrastructure regulation separate from government is to insulate the regulator's approach to administering its functions from the political process from the election cycle. However, economic regulation not completely insulated from the political process and tensions sometimes exist between long-term economic objectives with short-term political goals.

The survey sought information from economic regulators on the extent to which there was tension between government policy objectives and economic regulatory objectives, for new or to be privatised infrastructure. This would be of concern where that infrastructure was a natural monopoly or bottleneck. However, only a very small proportion of survey responses

identified tension between economic regulatory and political objectives for new or to be privatised infrastructure.

Box 2.3. **The ACCC's advocacy for effective regulation for privatised infrastructure**

In response to the survey, the ACCC noted that it agreed that there is a tension between government policy objectives and economic regulatory outcomes, particularly in the case of privatised infrastructure.

It considered that it is supportive of privatisations and has noted that State and Territory Governments are increasingly adopting a model in which commercial operations are run by the private sector unless there is a clear public policy objective that can demonstrably best be met by continuing public ownership. The ACCC considers this to be an effective approach to privatisation.

However, there are concerns that assets are being privatised in a manner that limits competition in order to maximise sale proceeds. For example, some Governments are privatising ports without appropriate regulatory regimes, or controls on pricing (e.g. the Port of Darwin). The ACCC has described this approach as one that increases the one-off sale proceeds by effectively taxing future generations and Australia's future competitiveness.

The privatisation of Sydney Airport illustrates the tension between maximising sale proceeds and facilitating future economic efficiency. During the 2002 privatisation process the Australian Government provided the acquirer of Sydney (Kingsford Smith) Airport with the right of first refusal to develop and operate any second airport within 100 kilometres of the Sydney CBD. This term of sale prevented a new, separately owned major airport from being established in Western Sydney at Badgerys Creek.

Source: Information provided in ACCC survey response.

However, while noting that they had not identified any tension for new to be privatised infrastructure, some survey respondents identified a number of sources of tension that related to their ongoing regulatory role. Some of the sources of tension identified by survey participants included where:

- government privatised or sought to privatise infrastructure in markets characterised by limited competition and market failure absent effective economic regulation
- cost of service approach to price regulation was implemented instead of incentive regulation

- governments supported specific investment projects despite them not being economic viable, the costs of which needed to be borne by customers through tariffs
- the economic regime specified an attractive rate of return, which may encourage over-investment
- government made decisions affecting market structure which would have implications for competition in those markets in the future.

What are the challenges currently facing economic regulators?

Economic regulation is tough. It is not simply an administrative role – it is complex and requires combining the technical expertise of experts from varying fields (economics, finance, engineering, law) to design a practical approach to implementing policy that affects the way in which infrastructure operators deliver services. There are often multiple solutions to problems and the economic regulator needs to be able to communicate the reasons why its solution best meets its mandate often in an adversarial environment but also in a manner that is accessible to all stakeholders. The stakes are high and the implications of economic regulators' decisions are far reaching given the importance of infrastructure to the economy.

In an environment where regulators frequently deal with changes in their roles and functions and where the approach to delivering on their mandate is not settled it is not surprising that economic regulators face challenges in performing functions and carrying out their role. Identifying, and seeking to resolve the challenges faced by economic regulators would enable them to better deliver their mandate, and may assist them in providing more certainty to infrastructure investors.

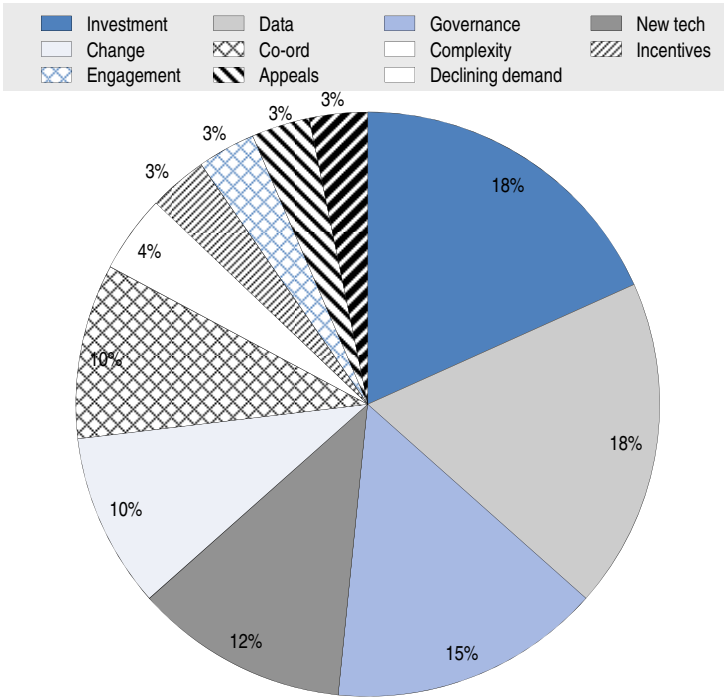
The survey asked economic regulators to identify the main challenges that they faced in carrying out their role. A large number of answers were received in response to this question. In order to provide an aggregate indication of the most common challenges faced by economic regulators, a common set of challenges was developed. Challenges that were unique to a particular regulator are not presented in this section.

Figure 2.17 shows the common challenges that more than one economic regulator faced:

- **Encouraging efficient investment:** the challenge in maintaining investment incentives while making decisions about tariffs or access to infrastructure

- **Data and information asymmetry:** challenges associated with information asymmetry and obtaining the right data to enable economic regulators to perform their functions

Figure 2.17. **Common challenges faced by economic regulators**



Note: This figure includes information from 55 sectors and subsectors respectively.

Source: The Role of Regulators in the Governance of Infrastructure Survey 2016.

- **Governance:** challenges associated with the governance of economic regulators
- **New technology:** challenges associated with applying infrastructure regulation in the context of technology change
- **Change:** challenges associated with a change in mandate, responsibilities or functions
- **Co-ordination:** the challenge associated with co-ordinating with other stakeholders (users, industry, and government) in the delivery of roles and responsibilities

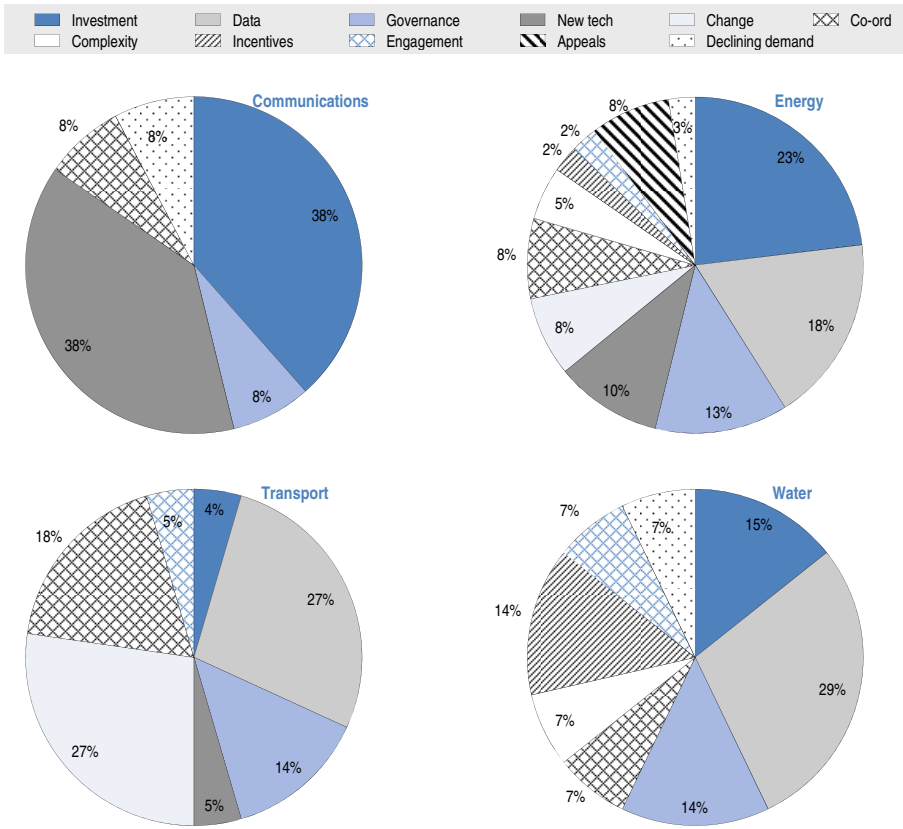
- **Engagement:** challenges associated with engaging with stakeholders in making regulatory decisions
- **Complexity:** the challenge associated with decision making in an increasingly complex environment
- **Incentives:** challenges associated with seeking to create financial incentives to encourage particular behaviour from infrastructure operators
- **Declining demand:** challenges associated with regulating long-lived assets where demand for the services provided over that infrastructure is in decline
- **Appeals:** challenges associated with decision making in the context of legal review.

The most frequently cited challenges were "encouraging efficient investment" (which involves seeking to balance the objectives on encouraging investment and also efficiency), and "data" (which involves concerns about difficulty that information asymmetry poses in decision making and insufficient data for decision making).

Figure 2.18 separates out the challenges faced by economic regulators by industry group. The most common challenges identified were different for the different industry sectors.

- Communications: the most common challenges identified in survey responses for the communications industry group were the new tech and encouraging efficient investment challenges.
- Energy: survey responses from the energy industry group economic regulators had the largest number of different challenges. The most common challenge faced by energy economic regulators were encouraging efficient investment, data and governance challenges.
- Transport: The most common challenge identified in survey responses in the transport industry group was data, followed by change and co-ordination.
- Water: The most common in challenge in survey responses from the water industry group was data, followed by encouraging efficient investment, incentives and governance.

Figure 2.18. **Common challenges faced by economic regulators, by industry group**



Note: This figure includes information from 10 communications, 21 energy, 14 transport, and 7 water sectors and subsectors.

Source: The Role of Regulators in the Governance of Infrastructure Survey 2016.

The challenges faced by economic regulators in detail

Encouraging efficient investment

One of the largest common challenges identified by economic regulators involved balancing efficient tariffs or the right level of regulation with the need to maintain incentives for efficient investment. This challenge also included where economic regulators were seeking to design incentives to encourage investment, or where economic regulators sought to ensure that long-term asset management objectives were not discounted in favour of short-term price outcomes. For example:

One economic regulator noted that this was particularly challenging where there was **increased investment needs associated with new technologies** (for example in energy, driven by renewables and feed-in priority). However, it was considered that effective cost benchmarking and incentive arrangements could address this challenge.

Another economic regulator noted that tariffs needed to balance limiting market power and ensuring a reasonable return. It noted that if tariffs did not provide a sufficient return that investors may leave an industry, and that this could have an adverse impact on the sector (a lack of network expansion, or reduced capacity associated with decreased maintenance).

Data (and information asymmetry)

Data is a category of challenges that included the general issue of seeking to reduce the level of information asymmetry in order to improve regulatory decision-making, and also includes specific issues around the collection and use of data. In relation to information asymmetry, one economic regulator noted that private infrastructure operators always had better information about their costs than the regulator, but that effective incentive arrangements could be put in place to reward private infrastructure operators for revealing cost information over time.

Other specific data issues that were raised included:

- **Unreliable data being provided by infrastructure operators**. For example, one economic regulator identified unreliable data being provided by infrastructure operators was one of the main challenges it faced in carrying out its role, and that it was taking steps to improve the quality of data provided by them.
- **Establishing and maintaining data collection arrangements**. After recently taking on a new regulatory role, one economic regulator considered that it was imperative to establish robust data and regulatory accounts that accounted for capitalisation and service classification changes to ensure that it was well supported in making future tariff decisions.
- **Coping with large amounts of data**. An economic regulator found it challenging to cope with very large data sets in undertaking its regulatory responsibilities.
- **A lack of publicly available data.** Concern was expressed about a decreasing amount of public available information that could be used to support an economic regulators' efficiency assessments in tariff reviews.

- **Making data publicly available.** One economic regulator considered that it was important that industry statistics and data were made available to the public to increase transparency in the sector.

Governance

Governance encompasses a number of different governance challenges that economic regulators are currently experiencing ranged from resourcing, to independence. The most common challenge raised in this category was a lack of resources to undertake the economic regulator's mandate.

- **Structuring regulators as a government department can constrain financial independence.** One regulator noted that it while it had financial autonomy, it continued to face restrictions on the use of its resources – in relation to staff salaries (which makes it difficult to attract staff), training and travel.
- **Regulators should be funded in line with roles and responsibilities.** Some regulators noted that facing a more complex operating environment, increasing expectations, and additional roles and functions had constrained resources.
- **Delivering on mandate is challenging absent sufficient powers.** For example, one regulator faced the challenge of seeking to encourage efficiency in the sector for which it had regulatory responsibility while having an advisory rather than determinative role.

New technology

The most common issue identified in this category was **the impact of technology change on their roles and functions**. This was particularly the case in telecommunications where technology change can influence the need and the scope of access regulation, particularly where such change creates new competition in markets where the service could only previously be provided through a bottleneck facility. Furthermore, the emergence of disruptive technologies (smartphone booking services) in the Taxi industry has also led to a more challenging regulatory role.

Other specific issues that were raised regarding technology change included:

- **Regulatory frameworks need to be sufficiently flexible to deal with change**. An energy regulator noted that the legislative frameworks needed to be sufficiently flexible in order to

accommodate new business models associated with emerging technology and not deter entry.

- **It is difficult to provide a stable investment environment in light of substantial technology change.** An economic regulator noted that technology change in telecommunications was a challenge to reconcile with an investor's need for certainty and that this needed to be accommodated for in the regulatory environment.

As substitution between technologies occurs and alternative technologies are used to provide services, consumer protection needs to keep pace. A telecommunications regulator noted that technology change had resulted in convergence, and that it was working to working to ensure that consumers receive sufficient information when they purchased telecommunications services.

Change (in roles and functions)

The change category primarily includes challenges associated with a change in a regulator's roles and responsibilities. While the roles and functions of regulators can change when technology changes, these have been included in the "new technology" category below.

Specific issues that were raised regarding changes in roles and functions included:

- **Implementing new functions requires an upfront investment.** One regulator noted that deciding how to implement its new roles and responsibilities was a substantial challenge in itself.
- **New roles and responsibilities often involved establishing new relationships and ways of working for both the infrastructure and the regulated firm.** Another regulator noted that it received new regulatory roles and responsibilities at the same time that the regulated firm had been created, and that a challenge was establishing an approach to working together with the regulated firm to implement the new framework.

Co-ordination

Co-ordination includes the challenge in co-ordinating with other entities in delivering their roles and functions. Economic regulators noted that they often needed to co-ordinate with government, with users and industry, and even other regulators.

- **Co-ordination is important in undertaking a new regulatory role.** An economic regulator noted that in two transport sectors the decision had been made to move to an independent body responsible for tariff regulation. This involved close co-ordination with the organisations that were previously involved in determining tariffs (including the Ministry) during the period of transition to the new regime.

Engagement

A number of economic regulators identified engagement with stakeholders as a challenge:

- **Managing stakeholder expectations about the scope of an economic regulator's mandate is important.** An economic regulator taking on a new role noted that would be a challenge to manage stakeholder expectations to ensure that there was clarity about what was within and what was outside its new role.
- **Customers should be part of, rather than outside the regulatory process.** An economic regulator who has sought to actively engage consumers in the tariff setting process noted that one of the key benefits was that the infrastructure operator sought to address the concerns of consumers rather than taking an adversarial role with the economic regulator.
- **While challenging, consumer engagement is beneficial.** Another regulator who has recently invested in its consumer engagement processes for its tariff review process noted that it had been successful. In addition to providing direct feedback on the tariff proposals of the network operators, consumers had also been directly involved in the subsequent process of legal challenges of the economic regulator's decisions.

Complexity

Complexity covers the challenge associated with the regulation of infrastructure becoming increasingly complex over time. This could involve the technical complexity of making tariff decisions increasing, with the regulator needing to weigh increasingly complex technical evidence in decision making.

One regulator noted that complexity was coming from a number of different sources, including the need to account for the misaligned views of different stakeholder groups, complexity associated with technology change,

ensuring that decision-making processes effectively accounted for these views and the complexity of the problem in front of the regulator itself.

Another regulator noted that a challenge it faced was "avoiding the temptation to be drawn into increasing regulatory complexity".

Incentives

The incentives category covers challenges associated with incentive arrangements that economic regulators administer to encourage or deter infrastructure operators from particular behaviour, such as increasing service quality or making efficiency gains. Specifically:

- **Creating an incentive framework for public owned infrastructure operators is challenging.** One regulator noted that its financial incentive frameworks had not been effective in encouraging a publicly owned business to improve service quality, and it needed to consider other options to achieve outcomes for consumers.

Another regulator stated that it faced a similar challenge with the publicly owned business it regulated. This regulator noted that this was attributable to the differing incentives that public businesses respond to compared to a private company (concerned with profitability).

Declining demand

The declining demand category includes challenges associated with infrastructure regulation in the context of declining demand. Generally, the **declining demand can create upward pressure on prices** for infrastructure industries because they have large fixed costs. As demand declines, these costs are often sought to be recovered from the smaller number of remaining consumers. In particular:

- **Declining demand combined with fixed costs can result in a cycle of price increases.** One regulator noted that budget constraints on consumers combined with more accurate usage information lead to more efficient usage put downward pressure on demand for regulated services. At the same time costs were rising due to investments in increased service quality, which had the effect of increasing prices and again reducing service usage.

  Another regulator noted the difficulties in achieving regulatory objectives in an economic crisis environment where consumers were budget constrained.

- **New demand side considerations are challenging to incorporate into determinations.** One economic regulator noted that it had sought to incorporate the impact of reduced utilisation on charges in a tariff decision, which had then been subject to legal review.

Appeals

This category includes the challenges that regulators face associated with legal review of the regulator's decision making.

- **Appeals can create considerable uncertainty.** One regulator noted that legal review of its decisions created uncertainty while the lengthy legal process took place. It noted that this created uncertainty over prices, and also where the same issue was relevant to another decision, over the approach that should be taken in that regulatory process.
- **Regulators need to continue to refine their approaches in the context of an appeal.** Another regulator noted that it faced legal challenges from a regulated business which considered that they were different from other regulated businesses so needed exceptional criteria. The regulator noted that this mean that the regulator needed to continually refine its approach to determining tariffs to make it robust to legal challenge.

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Annex A

Survey participants

Albania	Water Regulatory Authority (*Entit Rregullator të Ujit*)
Australia	Australian Competition and Consumer Commission
Australia	Australian Energy Regulator
Australia	Essential Services Commission (Victoria)
Austria	E-Control
Belgium	Flanders Environment Agency Water Regulator (*Vlaamse Milieumaatschappij*)
Brazil	Electricity Regulatory Agency (Agência Nacional de Energia Elétrica)
Canada	National Energy Board (*Office national de l'énergie*)
Canada	Canadian Transportation Authority
Colombia	Communications Regulation Commission (*Comisoón de regulación de comunicaciones*)
Czech Republic	Energy Regulatory Office (*Energetický regulační úřad*)
Estonia	Estonian Competition Authority (*Konkurentsiamet*)
France	Authority for the Regulation of Electronic Communications and Post (*Autorité de Régulation des Communications Électroniques et des Postes*)

France	Regulatory Commission of Energy (*Commission de régulation de l'énergie*)
Germany	Federal Network Agency for Electricity, Gas, Telecommunications, Post and Railway (*Bundesnetzagentur*)
Greece	National Telecommunications and Post Commission (*Εθνική Επιτροπή Τηλεπικοινωνιών και Ταχυδρομείων*)
Greece	Regulatory Authority for Railways (Ρυθμιστική Αρχή Σιδηροδρόμων)
Italy	Regulatory Authority for Electricity, Gas and Water (*Autorità per l'energia elettrica il gas e il sistema idrico*)
Italy	Transport Regulation Authority (*Autorità di Regolazione dei Trasporti*)
Japan	Ministry of Economy, Trade and Industry
Latvia	Public Utilities Commission (*Sabiedrisko Pakalpojumu Regulēšanas Komisija*)
Lithuania	Communications Regulatory Authority (*Ryšių reguliavimo tarnyba*)
Mexico	Energy Regulatory Commission (*Comisión reguladora de energia*)
New Zealand	Commerce Commission
Norway	Norwegian Communications Authority (*Nasjonal kommunikasjonsmyndighet*)
Peru	Supervisory Agency for Private Investment in Telecommunications (*Organismo Supervisor de Inversión Privada en Telecomunicaciones*)
Peru	Supervisory Agency for Public Transport Infrastructure (*Organismo Supervisor de Infrastructura de Transporte de Uso Público*)
Portugal	The Water and Waste Services Regulation Authority (*Entidade reguladora dos servicos de aguas e residuos*)

Russian Federation	Federal Antimonopoly Service (*Федеральная антимонопольная служба*)
Spain	National Authority for Markets and Competition (*Comisión nacional de los mercados y la competencia*)
United Kingdom	Office of Gas and Electricity Markets
United Kingdom	Office of Rail and Road
United Kingdom	Payment Services Regulator
United Kingdom	Water Industry Commission Scotland

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The Governance of Regulators

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