FISCALIA NACIONAL ECONOMICA

ANEXOS

Estudio de Mercado del Gas

(EM06-2020)

CONTENIDOS

Anexo A

Informe de Christopher Decker: "Policy Alternatives to Improve Competition in the Chilean Gas Market"

FISCALIA NACIONAL ECONOMICA

POLICY ALTERNATIVES TO IMPROVE COMPETITION IN THE CHILEAN GAS MARKET

EXPERT OPINION FOR THE FISCALÍA NACIONAL ECONÓMICA

Prepared by:

Dr Christopher Decker

5 October 2021

Table of Contents

Summary

1. This opinion identifies policy alternatives that could be introduced to enhance competition in the gas market in Chile and address some of the risks to competition identified by the FNE in its Gas Market Study. Specifically, it considers possible policy alternatives that could be introduced to address the risks of the horizontal cross-ownership and control of LPG and natural gas distributors in Chile, and policy alternatives that could make the supply of LPG more competitive given the horizontal and vertical supply structures.

Why are some industries subject to policy interventions?

2. Policy interventions in specific industries can be motivated by a range of factors including to: improve economic efficiency, control unilateral or collective market power; harness positive externalities; take account of the economic and societal importance of some products or because of fairness and distributional concerns; to address weak or limited demand side pressure; and to improve the competitive intensity of an industry.

3. In many jurisdictions, including Chile, policy interventions in natural gas supply typically seek to improve economic efficiency, control monopoly power and because access to gas is considered to be an essential service such that potential detriment to health, safety or wellbeing of citizens could arise from not having access to a reliable and affordable service (e.g. not being able to heat or cool home, cook, access hot water etc).

4. In contrast, the rationale for, and type and extent of, policy interventions in the LPG supply chain are more varied across jurisdictions. In countries like Chile where LPG represents the major, or only, gas source for many end-users policy measures might be warranted because: of concerns about high levels of concentration in LPG supply and associated collective market power; access to LPG is considered essential for a large proportion of the population who do not have access to grid supplied natural gas; to ensure that the price of LPG remains affordable, particularly given high levels of consumption by lower income households; and to address the limited demand side pressure exerted from downstream customers (sub-distributors and household and commercial end-users).

5. A brief survey of international experience shows that a range of policy measures have been introduced to improve competition in the supply of LPG across jurisdictions. These include: on-going monitoring or regulation of LPG prices; investigations and prosecutions in relation to coordinated or parallel pricing; non-price related interventions in LPG markets; policy measures aimed at increasing demand side pressure; and structural interventions.

Policy alternatives to address the risk to competition of horizontal cross-ownership and control

6. The FNE has identified a risk that the horizontal cross-ownership and control of natural gas and LPG in some municipalities may be adversely impacting on competition. Given this risk, policy intervention might be warranted in some circumstances to: ensure an efficient allocation of natural gas and LPG; remove the ability of the horizontally integrated operator to take advantage of its significant market power in the supply of one or both services; change the incentives of the horizontally integrated operator to invest or expand in one or both of the services; and reduce the ability of the horizontally integrated operator to shift or allocate costs associated with the non-regulated service (LPG supply) into the cost base of the regulated service (natural gas).

7. Policy alternatives to address the risk that horizontal integration may be adversely impacting on competition could involve behavioural interventions which require the integrated operator to legally commit to certain obligations and to price monitoring arrangements, or to certain service standards or targets regarding service quality and network expansion.

8. Alternatively, structural policy interventions could be introduced which involve the separation of the LPG operations from the natural gas operations in those municipalities where there is an overlap. These separation policies could require: the divestment of ownership or control in the supply of one of the services; line of business separation or ringfencing which would require that separate business and operating units to supply LPG and natural gas are established internally; or accounting separation.

Policy alternatives to address the risks of coordination among the major LPG suppliers

9. The FNE has concluded that there is a risk of coordinated behaviour in the supply of LPG given various structural factors and an analysis of the extent to which historic LPG input cost reductions have been passed through to customers.

10. One way to address the risks of coordination is to rely on ex post enforcement of competition law to prosecute suppliers that have been involved in such coordination. Successful prosecutions for coordinated or parallel pricing in LPG supply have been being brought in some jurisdictions (such as Korea and Taiwan).

11. An alternative set of policies could seek to address the risks of coordination arising in the first place and might involve: structural measures such as divestment of certain assets to create a new competitor; on-going monitoring of LPG prices; periodic, or ad hoc, reviews of competition between LPG operators; sector specific market manipulation rules that place

additional legal restrictions on the ability of the LPG operators to coordinate; or various forms of price regulation or oversight.

Policy alternatives to address the risks of high levels of vertical integration

12. The FNE found evidence that the high levels of vertical integration may be reducing competition in the supply of LPG. Among other things it found that three companies own or have exclusive access to terminals near ports, operate regasification installations, own the cylinders and trucks that transport bulk LPG, and have exclusivity contracts with more than 5000 sub-distributors.

13. To address concerns that vertical integration is harming competition one option is to challenge certain conduct using competition law provisions. For example, if a vertically integrated LPG operator has significant market power in one activity (e.g.: operation of an input terminal or storage facility) and is not providing access to that indispensable or essential input on reasonable terms this could be challenged as a refusal to supply.

14. Alternatively, policies could be introduced that keep the vertically integrated operator intact but require that it provide access to key inputs that rivals need to compete in a related market on fair and reasonable terms. If such policies are considered insufficient to change the incentives of the vertically integrated operator, then various forms of vertical separation (or ringfencing) policies could be contemplated which aim to create greater operational and decision-making independence and thus reduce the ability and incentive of the vertically related upstream LPG operator to discriminate against its rivals in the competitive activity.

Policy alternatives to address concerns about vertical agreements and restraints

15. Finally, the FNE found that there was limited switching among the sub-distributors, which it attributed, in part, to rigid contractual provisions in the vertical supply agreements including the indefinite nature of the supply agreements and the use of incentives to encourage sub-distributors to be exclusive suppliers.

16. To address concerns about the vertical agreements between upstream LPG operators and third-parties (such as sub-distributors) one option again is to rely on competition law to challenge aspects of the agreements which are seen as restrictive of competition (e.g.: use of fidelity discounts or loyalty payments).

17. An alternative set of policy measures could focus on preventing the adverse effects of vertical restraints arising in the first place. Such policies could prohibit certain contractual provisions or other vertical restraints (such as long termination periods or undue termination charges) that lock-in downstream customers (e.g.: sub-distributors and end-users) or address other impediments to downstream customers searching and switching to alternative providers (e.g.: require that contracts be clear and transparent).

1. Introduction

18. I have been instructed by the Fiscalía Nacional Económica (FNE) to provide an opinion on matters relating to the functioning of the gas market in Chile. Specifically, I have been asked to:

    i. Review the background to, and findings of, the FNE's Gas Market Study which has examined the supply arrangements for and degree of competition in natural gas and liquefied petroleum gas (LPG) in Chile.

    ii. Set out in general terms possible rationales for future policy interventions in the gas market given the findings of the Market Study.

    iii. Consider possible policy alternatives that could be introduced to address the risks to competition of horizontal integration of LPG and natural gas distributors in Chile.

    iv. Consider possible policy alternatives to make LPG supply more competitive and to address the adverse effects that could arise in the supply of that service given the current horizontal and vertical supply structure.

19. The purpose of this opinion is to assist the FNE in understanding the policy alternatives that it could pursue to remedy some of the adverse impacts on competition identified in its Gas Market Study. The nature of the discussion in this opinion is therefore high-level and exploratory in nature; it seeks to identify a set of policy alternatives that could be used drawing on a combination of general economic and regulatory principles and experience from other jurisdictions and sectors. While the opinion sets out, in general terms, examples of policy alternatives that could be used (and have been used in other contexts), it does assess the likely appropriateness or effectiveness of these policy alternatives which would require further detailed analysis.

20. In preparing this opinion I have not examined nor assessed the underlying evidence or decisions made by the FNE which have given risen to the conclusions contained in the Gas Market Study report. I therefore offer no opinion on those issues or the assessment of the state of competition in the gas market as contained within that report.

21. My qualifications are set out at the end of this opinion at Annex 1. The following sections are structured around the four questions on which I have been asked to provide an opinion as listed in paragraph 18.

2. Background and findings of the Gas Market Study

22. This section briefly sets out my understanding of the background to and findings of the Gas Market study on which I have based my opinion. It describes in turn:

- the upstream and downstream supply structures for natural gas and LPG;
- the characteristics of consumers that demand natural gas and LPG;
- the current economic regulation that applies to natural gas and LPG;
- the specific factors which motivated the FNE to initiate the Gas Market Study;
- the findings of the Gas Market Study most relevant to this opinion.

2.1 Supply structure

(a) Natural Gas

23. Chile's upstream supply of natural gas comes from two sources: imports of Liquified Natural Gas (LNG) which account for around 80% of domestic gas consumption, and the production of natural gas in the Magallanes Basin by the National Petroleum Company (ENAP) and collaborating entities. LNG imports enter Chile through two terminals in Quintero and in Mejillones, with the Quintero terminal being the larger of the two both in terms of regasification and storage capacity. Primary access to the LNG import facilities at the Quintero terminal is limited to its three owners, and two companies that have obtained primary access through Open Season procedures.[1] In contrast, there is open access to the LNG terminal in Mejillones, which means that any entity can purchase LNG in the international market and import it through that terminal at rates negotiated with the owners.

24. Natural gas is either transported through pipelines in a gaseous state, or in the case of LNG, in a liquid state on roads using trucks. LNG is delivered to one of 40 re-gasification plants, where it is then stored or passed through into local distribution networks. Importantly, the natural gas distribution network only covers an estimated 20% of the municipalities in Chile.

(a) Liquefied Petroleum Gas (LPG)

25. There are also two sources for LPG in Chile: imports of LPG (which account for around 75% of domestic consumption) and domestic production. LPG imports enter Chile through three terminals: the Gasmar and Oxiquím terminals in Quintero and the Hualpén terminal

[1] Primary access allows companies to purchase LNG in the international market and import it directly to Chile through the Quintero terminal, while other entities requiring LNG would have to purchase it from a primary access holder in a secondary market.

in Biobío.[2] Three main LPG upstream suppliers (Gasco; Abastible and Gasmar through Hualpén; and Lipigas through Oxiquim) have control of, or are contracted to, all of the capacity at these three terminals.

26. LPG is transported from the Quintero import terminals through two connected pipelines to Maipú from which it is supplied to the main distributors.[3] LPG is transported from the Hualpén terminal through gas pipelines that connects with local distribution plants and tankers. LPG is sold to end-users in three ways: in cylinders of various sizes by around 5,000 sub-distributors; in 'bulk' meaning that it is transported by truck to a local storage site where it can then be accessed by customers;[4] or, less commonly, through a dedicated gas pipeline network.

2.2 Demand for natural gas and LPG

27. The demand for gas differs for natural gas and LPG. In 2018, the highest demand for natural gas was for electricity generation, followed by industrial, residential, commercial and then the public sector.[5] In contrast, in 2018, the highest demand for LPG was for the residential sector, followed by industrial, commercial, public sector and transport uses. Around 84% of residential consumption is from cylinder LPG.

28. Residential consumers spend a significant proportion of their household budget on gas consumption, estimated at up to 19% of total expenditure on basic services. Only around 21.4% of households in Chile have access to the natural gas network, and access is strongly correlated with household income. While some 52.1% of households in the richest quintile have access to natural gas only 7.4% of household in the first quintile have access to the natural gas. As the price of natural gas is lower than LPG, this means that lower-income households typically pay a higher price for accessing gas than the highest income households.

2.3 Economic regulation of natural gas and LPG

29. The upstream production of indigenous natural gas and petroleum products are regulated under specific laws, concessions agreements and special operating contracts. In contrast, there is no current specific economic regulation that applies to the import of LNG or LPG products.

[2] The Gasmar terminal is the largest of the three with a storage capacity of 145,000 m3, while the Oxiquim and Hualpén terminals have capacities of 50,000 m3 and 40,000 m3 respectively.
[3] One pipeline goes from Quintero to the ENAP refinery in Concón, and from the latter to Maipú. They are owned by the Sociedad Nacional de Oleoductos S.A.
[4] Bulk supply can either be metered or unmetered; the former involves customer being charged for actual consumption.
[5] Looking ahead the demand for natural gas an input to electricity production is expected to grow as the Chilean energy sector transitions to a greater proportion of renewable energy supported by gas-fired electricity generation.

30. The extent of economic regulation of gas transportation and distribution companies differs according to the type of gas and distribution method. Natural gas transportation and distribution companies which operate under concession agreements are regulated in terms of prices they can set and quality of services. Natural gas distribution companies that do not operate under concession agreements are not subject to price regulation, but must satisfy certain rules relating to service quality and the right for consumers to switch.

31. In contrast, no price regulation applies to bulk LPG and the sale of LPG cylinders to customers. However, bulk LPG providers are subject to the same rules as non-concession natural gas companies in terms of service quality and the right for consumers to switch etc.

2.4 Motivation for the Gas Market Study

32. Four factors motivated the FNE's market study into the gas market, including:

- **Horizontal cross-ownership and control of natural gas and LPG:** concerns have been raised about the effects of cross ownership or control in the supply of natural gas and LPG in some municipalities, [6] particularly in terms of the effects on prices and incentives to expand the natural gas network.

- **Observed price differentials according to type of gas, delivery method and location of supply**: according to the FNE there are significant differences in the price of gas depending on how is it distributed (i.e.: concession or non-concession networks, or via LPG cylinder) with natural gas supplied via a pipeline network being cheaper than LPG. There are also significant differences in the price of LPG between different brands in the same geographical area.

- **High levels of vertical integration:** the main companies involved in importing gas to Chile are also involved at other stages of the supply chain such as storage, transportation and distribution to consumers. The FNE sought to examine whether such structures are efficient and promoting or harming competition at different stages in the supply chain.

- **Differences in coverage and regulation for natural gas and LPG:** There are differences in terms of access to gas as compared to other essential services such as electricity, water and communications. There are also important differences in the price regulation applied to concession natural gas providers, non-concession natural gas providers and LPG distributors.

[6] According to FNE, Lipigas (Yaconi-Santa Cruz Group) and Gasco (Pérez Cruz Group) participate in both markets directly, while AntarChile (Angelini Group) has stakes in both Abastible (LPG) and Metrogas (GN) a company in which it shares ownership with CGE Gas Natural S.A.

2.5 Findings of the Gas Market Study

33. Taking account of the above features of the gas market and the current regulatory framework, the purpose of the Market Study was to examine how well the gas market is functioning and whether the current structure and supply arrangements could be having adverse effects on wholesale and retail consumers.

34. Three findings of the Gas Market Study are relevant to the questions addressed in this opinion:

- The effects of horizontal joint participation by the same economic groups in LPG and natural gas in some municipalities;
- The risks of coordinated behavior in LPG supply;
- The effects of high levels of vertical integration and vertical restraints in LPG supply.

(a) Horizontal joint participation in LPG and natural gas by the same economic groups

35. According to the FNE, approximately 70 municipalities (out of around 340) have access to both natural gas and LPG. Within those 70 municipalities there are some areas where LPG suppliers are in the same economic group as the natural gas distributors (i.e.: there is a degree of horizontal integration). The FNE examined whether this horizontal integration had a negative impact on competition in terms of higher prices and reduced incentives to extend the natural gas network. It found that, on average, in municipalities where there is horizontal integration the price of LPG is higher than in municipalities where there is no legal or economic relationship between natural gas and LPG distributors (i.e.: non-integrated municipalities).

(b) The risks of coordinated behaviour in LPG supply

36. According to the FNE, the LPG market is a highly concentrated market comprising only three major wholesalers/distributors (upstream operators). In their assessment this high level of concentration as well as various structural factors give rise to a risk of coordinated behavior. These factors include: predictable LPG demand which is highly correlated with temperature; limited countervailing buyer power on part of buyers and sub-distributors (on average below 0.1% of demand); and stable market shares between the three competitors at the national level. In addition to these structural factors the FNE performed various econometric tests to explore the extent to which historical LPG input cost reductions were passed through to customers. These tests reveal, among other things, that cost reductions were not passed through and that margins increased. In sum, the FNE concludes on the basis of structural factors and its analysis that there is a risk of coordinated behavior in the supply of LPG.

(c) The effects of vertical integration and vertical restraints in LPG supply

37. The FNE also found evidence of high levels of vertical integration in LPG supply. Three companies own or have exclusive access to terminals near ports, operate regasification installations, own the cylinders and trucks that transport bulk LPG, and have exclusivity contracts with more than 5000 sub-distributors. Notwithstanding the large number of sub-distributors the FNE's analysis revealed that there is very limited switching, and over the last nine years less than 2% of sub-distributors changed from one wholesaler to another. It also found that less than 2% of the sub-distributors are multi-brand distributors; in other words 98% of sub-distributors sell only one brand of LPG .

38. The FNE's analysis of supply contracts found evidence of rigidity which may reduce the incentive or ability of downstream customers to switch supplier. This includes contracts that extended in length indefinitely (evergreen) and requirements that termination notice be given many months in advance. While the FNE found that the contracts contain incentives linked to the volume of sales, other evidence gathered suggested that a large part of the incentives are used to encourage sub-distributors to be exclusive suppliers.

3. Rationales for policy intervention in the Gas Market

39. This section explores, in a general way, the reasons why policies might be needed to improve competition in the gas market and address the issues identified by the FNE in its Gas Market Study. In other words, it explores the question: why might policy interventions be necessary in the Chilean gas market? The discussion focusses on three issues:

    - First, it explores general rationales for policy interventions in certain industries and sectors of the economy.

    - Second, it sets out the specific reasons why the natural gas industry in many jurisdictions, including Chile, is subject to on-going regulatory oversight.

    - Third, it explores possible reasons why, and in what circumstances, LPG markets might be subject to additional policy measures.

40. The discussion in this section serves as a general background to the more specific analysis presented in sections 4 and 5.

3.1 Why are some industries subject to policy interventions?

41. A central issue confronting all policymakers in practice is why, and in what circumstances, a particular industry, or activity within an industry, should be subject to additional policy measures over and above that of general competition law that applies to all sectors. In other words, why is it that some industries or activities are subject to additional rules or external oversight of prices, performance or other operating decisions (what I call 'additional policy measures/interventions' for the purposes of this Opinion)?

42. In the utility industries, including natural gas transmission and distribution, the rationale for on-going policy interventions is widely understood and generally related to the underlying demand and cost characteristics. However, in other industries, particularly where there are multiple competing suppliers, the argument for additional policy measures – including one-off regulatory measures – can be more idiosyncratic, and tends to be associated with specific concerns about the concentration of supply structures (including barriers to entry) or issues associated with a significant information and power asymmetry between suppliers and users which have market-wide effects.

43. This section provides a brief overview of different high-level rationales for introducing additional policy measures in specific industries. It focusses on seven broad rationales:

- To improve economic efficiency.
- To control for market power.
- To harness positive externalities.
- To take account of the economic and societal importance of some products and services.
- To address fairness and distributional concerns.
- To address limited demand side pressure and make customers more active.
- To address low levels of competitive intensity.

44. While the discussion focusses on the reasons, or rationales, for additional policy measures a separate question is how such policies are designed and implemented. Specifically, policy measures can be on-going or one-off interventions, be structural or behavioural in nature and can be backward looking (to redress past harms) or forward looking (to create conditions for improving future competition in a market). These aspects of the design and implementation of policy, while highly relevant to the effectiveness of a policy, are outside of the scope of what I have been asked to consider and not discussed further in this opinion.

(a) To improve economic efficiency

45. Standard rationales for on-going policy interventions of utility industries, including the transportation and distribution of natural gas, typically focus on improving economic efficiency. Three types of efficiency gains in particular are often referred to: economies of scale;[7] economies of scope;[8] and economies of density.[9] On-going policy intervention in the form of price regulation and control of entry is typically justified in these industries to improve allocative efficiency by ensuring that prices reflect the underlying marginal benefits and costs of supply,[10] and to promote productive efficiency by avoiding the wasteful duplication of fixed costs or entry by firms that only to service a select group of the most profitable customers (so-called 'cream skimming'). Another efficiency rationale for intervention is to enhance dynamic efficiency by creating the conditions and incentives for new suppliers to enter or existing suppliers to expand their activities, innovate, adopt new technologies or cost-reduction techniques that bring benefits to customers, including future customers, over the longer term.

[7] Where high fixed costs gives rise to a cost profile in which average costs decline as production increases for a specific level of demand).
[8] Where multiple services are provided using the same assets or infrastructure and where it is more cost effective for a single provider to supply all of those services than to have a number of providers of separate services. As with economies of scale, whether economies of scope will arise is conditioned by a range of factors such as whether all suppliers use the same technology and the level of expected market demand.
[9] Where average costs reductions are associated with greater usage/utilisation of an asset or facility – e.g.: average costs can reduce the greater the number of users of a gas network in a specific area.
[10] In other words, it will result in 'allocative efficiency', such that finite resources will be allocated to their most valuable uses.

(b) To control market power

46. Another common rationale for policy intervention arises in settings where – either as a result of statutory restrictions or because of other cost, structural or technological reasons – there is only a single, or small number of, supplier(s) of a service. Suppliers who hold a position of unilateral or collective market power, can have an incentive, and the ability, to behave in ways that exploit that position of power, for example, by setting prices considerably above underlying costs, degrading quality, or be insufficiently responsive to cost and other production efficiencies. Where firms are vertically integrated and have market power in an upstream or transportation markets another concern is that they can use their control over an 'indispensable' input to exclude competitors with whom they compete in related downstream markets. In addition, because suppliers with significant market power do not face the threat of competition, they may also produce at higher levels of cost than firms who operate in competitive markets (who are naturally incentivised to cut costs to improve profitability and remain competitive). In short, this rationale for intervention is framed in terms of both efficiency and equity considerations.

(c) To address externalities

47. Policy interventions are sometimes introduced to address the externalities that can arise in some industries. Externalities arise where there are wider costs or benefits associated with the supply of a service than those that accrue to the immediate parties to the transaction.[11] There are both positive and negative externalities. Examples of positive externalities include the widespread benefits associated with the provision of reliable energy supplies for cooking and heating, clean drinking water and adequate sanitation (which reduces the spread and cost of illnesses) or extensive transportation and communications networks (which allow more people to connect with one another). In each of these cases, policy interventions can be premised on the need to ensure that the wider societal benefits/harms of transactions in certain services are realised/avoided.

(d) In recognition of the economic and societal importance of some products and services

48. A related but more general explanation for policy interventions in some industries relates to the importance of the services provided both to an economy and to society. In essence, some interventions are a response to concerns that the pricing and allocation of some services are 'too important' to be left to market processes alone. In many jurisdictions, energy supply is often described as being 'essential', such that the efficient provision of these services is likely to benefit a number of members of a society and other sectors in an economy. This is often on the basis that such protections are required for health, economic and social reasons. For example, in Europe, the recent Clean Energy Package Directive states that: *"Energy services are fundamental to safeguarding the well-being of the Union*

[11] That is, there are uncompensated third-party effects.

citizens. Adequate warmth, cooling and lighting, and energy to power appliances are essential services to guarantee a decent standard of living and citizens' health. Furthermore, access to those energy services enables Union citizens to fulfil their potential and enhances social inclusion."[12] Similarly, in California, it has been noted that "*quite simply, energy access is critical to economic and social stability and well-being*" [13] while in Pennsylvania, access to energy services is described as being *"essential for health, safety, a liveable home, child development and maintaining vibrant communities throughout Pennsylvania"*.[14] The UK Parliament, has described energy as *"a special and essential service…. an unavoidable necessity of life, which amounts to a significant portion of household budgets … There is something very fundamental about energy—about heating and lighting a home—particularly for the most vulnerable customers."*[15]

(e) Affordability and distributional concerns

49. Policy interventions have been introduced in some industries, at least in part, as a response to distributional issues, including issues relating to fairness and equity. This rationale rests on an underlying assumption that certain services (such as energy services) are merit goods and that they should be provided to all users on a broadly equivalent basis. On this line of reasoning, one of the purposes of policy interventions is to ensure wide coverage and affordable access to the service. In many jurisdictions interventions in the energy sector is often premised on a need to ensure 'fairness', 'equity' and, in some cases, 'affordability'.

(f) Limited or weak demand side pressure

50. Policy interventions have sometimes been introduced because of the characteristics of those who purchase and consume the product. Specifically, some interventions in the energy sector have been introduced to address the fact that customers (including intermediate parties in the supply chain) may have access to poor or limited information (there are severe information asymmetries) or suffer from decision making biases, or otherwise prone to making irrational or imperfect decisions. These demand-side characteristics have implications for the extent of search and switching in a market, and therefore the

[12] European Union (2019). Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU.

[13] California Public Utilities Commission (CPUC) (2018a). 'Order Instituting Rulemaking to Consider New Approaches to Disconnections and Reconnections to Improve Energy Access and Contain Costs'. 12 July 2018.

[14] Pennsylvania Public Utility Commission (PUC) (2019). 'PUC Takes Major Steps to Address Energy Affordability for Low-Income Households; Revises Policy on Customer Assistance Programs and Initiates Rulemaking for Universal Service Programs'. Press Release. 19 September 2019.

[15] House of Commons Business, Energy and Industrial Strategy Committee (2018). 'Pre-legislative scrutiny of the draft Domestic Gas and Electricity (Tariff Cap) Bill' Fourth Report of Session 2017–19 Report. HC 517. 13 February 2018.

countervailing pressure placed on suppliers. In short, policy interventions have been directed at making customers more active in the market.

(g) Low intensity of competitive rivalry among suppliers

51. In industries where multiple suppliers compete intensively it is often the case that additional policy interventions are not necessary as robust competition should ensure that firms have natural incentives to set prices which reflect underlying costs, provide reliable and good quality services, and overcome information asymmetries where they exist so as to expand their market position. Conversely, in markets controlled by an unregulated monopoly provider, or a small number of suppliers who align their behaviour, there is a high risk of higher prices and lower quality of services.

52. In practice, many industry structures fall between the extremes of monopoly and being highly competitive. These market contexts might be categorized as those where: suppliers have some degree of market power or are highly concentrated which can create incentives for coordinated behaviour; suppliers lack strong incentives to maintain a good reputation because of high levels of concentration or barriers to entry; there are pronounced information asymmetries between suppliers and customers; or there is a 'poor' equilibrium, where all suppliers in a market may to different degrees seek to soften competition or exploit customers. In these settings, policy interventions have sometimes been premised on a desire to intensify competition between providers, including by lowering barriers to entry; providing customers with better and more accurate information; limiting contractual or other terms which create customer 'lock-in' and reduce demand side pressure; or to limit the scope for opaque or unclear practices which create customer confusion or exacerbate inertia.

3.2 Rationales for policy interventions for natural gas supply

53. Having considered the general rationales for policy interventions in some industries and activities, it is useful to consider why the supply of natural gas is subject to policy interventions in many jurisdictions including Chile, and which activities in the natural gas supply chain are typically subject to such interventions.

(a) Why is natural gas subject to policy interventions?

54. In many jurisdictions, some activities in the supply of natural gas – typically gas transmission, distribution and, in some cases, gas storage and retail supply – are subject to ongoing policy interventions in the form of regulation of prices and other aspects of service quality. Table 1 draws on the discussion in section 3.1 to summarise the typical reasons for such interventions.

Table 1: High-level rationales for the policy interventions for natural gas supply

Rationale	Explanation
To enhance economic efficiency	• Gas transmission pipelines and distribution networks are often subject to ongoing regulation on the basis that they involve large sunk investments in long-lived and immobile capital assets, which give rise to economies of scale, scope and density at certain levels of demand. • Structural policy interventions – such as separation and unbundling policies – have sometimes been introduced to separate core network activities from the competitive activities to promote entry and dynamic efficiency.
To control monopoly power	• Many gas transmission and distribution companies have a statutory monopoly in a specific geographic area, such that they are the sole supplier. • Gas storage operators (including LNG operators) and gas retailers with significant market power can also be subject to policy intervention and regulation in some jurisdictions where they have significant market power.
To harness positive externalities	• Gas services are often seen as critical to the development of many economies. In some jurisdictions, gas pipeline operators and distribution companies can be given incentives to expand the network and respond to demand.
Economic and societal importance of services	• Access to energy services (including gas) in many countries is seen as essential and important in nature such that there could be potential detriment to health, safety or wellbeing arise from having access to reliable energy (e.g. not being able to heat or cool home, cook, access hot water etc).
Affordability and distributional concerns	• In many jurisdictions price regulation of energy services, including natural gas services, aims to ensure that the price for services are fair and affordable. • In some jurisdictions additional policies have been introduced to ensure that all consumers of energy services are treated fairly by suppliers or have certain 'rights', and to protect and provide assistance to vulnerable consumers or those experiencing financial hardship.
Limited or weak demand side pressure	• Policy measures in some jurisdictions, such as in Australia, UK, EU have sought to overcome and address the 'obstacles' customers face in fully benefiting from retail competition in gas and to empower consumers and make them more 'active participants' in energy markets.
Low levels of competitive intensity	• Policy measures in some jurisdictions has focused on intensifying competitive rivalry among the largest retail energy suppliers. This has included policies to promote greater consumer engagement, but also in some cases the imposition of default price caps for gas, or structural measures such as the separation of different activities in a supply chain.

(b) What activities in the natural gas supply chain are subject to policy interventions?

55. In many jurisdictions, including Chile, the types of policy interventions and measures applied in the natural gas sector differ according to the activity and the type of provider of services. Table 2 below summarises the activities in the natural gas supply chain that are typically subject to some form of policy intervention in many jurisdictions.

Table 2: Policy interventions in natural gas supply chain

Activity	Type of policy intervention
Upstream production or importation of natural gas	• Specific policies can apply to the right to gas exploration and production, as is the case in Chile. However, gas importation activities are typically not subject to any form of on-going regulation in many jurisdictions on the assumption that competition among producers to procure LNG on international markets will be sufficient to address concerns about the exploitation of monopoly power.
Transportation of natural gas through pipelines	• In many jurisdictions gas transmission companies are subject to on-going price and non-price regulation and other conditions relating to third-party access. This reflects the fact that such operators either hold a monopoly position or have significant market power. There can also be restrictions on the ability of pipeline operators to be involved in other stages of the gas supply chain to prevent them from leveraging their significant market power into related competitive activities.
Distribution of natural gas through local networks	• In many jurisdictions gas distribution network operators are subject to on-going price and non-price regulation and other conditions relating to third-party access. There can also be restrictions on the ability of distribution network operators to be involved in other stages of the gas supply chain to prevent them from leverage their significant market power into related competitive activities.
Gas storage	• The development and operation of gas storage facilities is, in principle, a potentially competitive activity, insofar as different owners and operators can develop facilities at various locations on a transmission network (such as new LNG regasification terminals). • However, storage operators, particularly of large storage facilities (including LNG facilities), that can only be reached by a single transmission pipeline, or where they are owned and operated by integrated transmission pipeline operators can be subject to on-going oversight. This can involve requirements to provide third-party access to the facility on non-discriminatory terms. • There can also be requirements in some jurisdictions that storage facilities be legally and functionally separated (where the storage or LNG operators are vertically integrated) from other activities in the gas supply chain.
Gas retail activities	• In some jurisdictions, competition has been introduced and on-going price regulation withdrawn for gas retail supply activities. However, in other jurisdictions such as some states of the US, gas rates and tariffs are subject to ongoing regulation. In the UK, gas price retail regulation has recently been re-introduced in the form of default price cap.

3.3 Rationales for policy interventions for LPG

56. The type and extent of policy interventions in the LPG supply chain are more varied than those applied to natural gas supply. In some jurisdictions, LPG is simply treated as an 'alternative fuel' and is not subject to any additional economic policy oversight or measures beyond that which applies under general competition law.[16] In other jurisdictions, policy interventions have been introduced to address concerns about LPG pricing, the concentrated structure of the LPG market, or the potential customer harm arising from contractual terms or other vertical restraints.

57. Broadly speaking, the different treatment of natural gas and LPG in many jurisdictions appears to reflect three factors:

- First, in many jurisdictions, particularly in North America, Europe and Australia, there is an extensive natural gas distribution supply network. This network is the primary method through which most end-users (households and commercial customers) obtain access to gas, and for these users LPG is seen as a 'back-up' source of gas supply. While some proportion of the population in these jurisdictions do not have access to natural gas, these customers tend to be small in number and be in isolated locations or have other specific circumstances which means that they cannot be supplied with natural gas (e.g.: live in a remote village or a caravan park).

- Second, as described below, the supply and demand characteristics differ as between natural gas and LPG. Most notably, the transportation and distribution activities differ (natural gas is transported in pipes to a customer's premises while LPG uses a combination of pipes, trucks and tanks/cylinders) which has implications for costs and the scope for entry etc. In addition, while electricity generation is a major user of natural gas in many jurisdictions (including Chile), the principal demand for LPG comes from household and commercial users, which depending on their location can sometimes choose between multiple LPG sub-distributors or retailers.

- Third, the rationale for introducing specific policies related to LPG pricing in some jurisdictions where there is limited supplies of natural gas have sometimes reflected wider policy goals such as a desire to encourage a shift away from more harmful and polluting forms of fuel (such as wood) towards LPG. This has sometimes resulted in subsidies or price controls being introduced for LPG.

[16] Of course there are safety and technical regulations applied, but these are not the focus of this opinion.

58. Against this background, the remaining discussion in this section considers first the possible rationales for introducing additional policy measures for LPG supply in settings where it is a main source of gas supply for many end-users (as in Chile). We then consider, in general terms, the types of policy measures that have been introduced in LPG markets in other jurisdictions.

(a) Why might LPG supply be subject to additional policy interventions?

59. Table 3 sets out a general analysis of how each of the rationales for policy intervention identified in section 3.1 might apply to the supply of LPG. As noted, a crucial assumption underpinning the analysis in table 3 is that LPG represents the major, or only, gas source for many or a majority of end-users in a specific jurisdiction. In other words, it assumes that most households do not have access to an alternative source of natural gas supply and are therefore reliant on LPG as the only source of gas to heat or cook etc.

60. I am not in a position to assess which of the rationales set out in table 3 apply to the specific context of LPG supply in Chile. However, from the background facts I have been given (described in section 2 above), it would appear that on the face of it some of these rationales for policy action could be relevant to the Chilean context. For example, policy interventions might be warranted:

- to address concerns about (collective) market power associated with the high levels of concentration in LPG supply;
- because access to LPG is considered essential for a large proportion of the population who do not have access to pipeline supplied natural gas;
- to address distributional concerns and ensure that the price of LPG is affordable, particularly given that it is typically consumed by lower income households;
- to address the limited demand side pressure exerted by sub-distributors and end-users;
- to address the concerns about low levels of competitive intensity between the main integrated upstream suppliers of LPG (discussed further in section 5).

61. It is also worth noting that policy action in other jurisdictions has been motivated by the fact that from a household perspective there is a functional equivalence between natural gas and LPG, and that it can be an essential product for some households. For example, the UK competition agency has previously noted " *LPG performs the same household functions as mains gas, but is delivered by road and stored on individual premises*".[17] Similarly, the Portuguese Competition Agency has noted that LPG has "*an important social role, since they are the only gas based fuel accessible in several regions in the country where natural*

[17] Office of Fair Trading (2011). Off-Grid Energy Market Study. October 2011.

gas has not arrived, and in sensitive areas of urban districts."[18] Further, the Canadian Competition Bureau has noted that LPG (propane) is an essential good for some consumers in that country,[19] while in South Africa access to cylinder LPG is particularly important for poorer households.[20]

Table 3: Possible rationales for policy interventions for the supply of LPG

Rationale	Explanation
To enhance economic efficiency	• Upstream investments in LPG import terminals, storage and regasification facilities can involve large sunk costs in long-lived and immobile capital assets. Although this could give rise to economies of scale, scope and density at certain levels of demand, these activities are generally not subject to specific ongoing policy interventions. • Transportation and downstream LPG activities involve less substantial investments in fixed and immobile assets than for natural gas, and are activities where there is scope for competition between alternative providers. • In some circumstances policy interventions might be necessary to allow for third party access to core and indispensable activities in the supply chain (such as access to LPG import terminals or storage facilities) with the aim of promoting entry and enhancing dynamic economic efficiency.
To control monopoly power	• In many jurisdictions the supply of LPG is often characterized by a small number of vertically integrated providers who combine the importation/production, storage and transportation. The extent of competition between these vertically integrated providers can vary, and as described below, there have been concerns in a number of jurisdictions about parallel/coordinated behavior. On-going oversight of LPG retail prices may be necessary in some circumstances to address concerns about unilateral or collective market power. • In some circumstances, policy interventions might be considered necessary to address the risks that market power is leveraged from one activity to another (either horizontally or vertically) with the aim of foreclosing competitors. • While in many jurisdictions there is often a large number of sub-distribution/retailers of LPG policy interventions might be warranted where they have limited bargaining power vis-à-vis upstream suppliers and to address specific contractual terms or vertical restraints under which they operate (e.g..: exclusive agreements). • Policies may also be needed to address concerns that end-users are contractually or constructively 'locked-in' in to a particular LPG provider which reduces incentives to search and switch.

[18] Autoridade da Concorrência (2009). Detailed analysis of the liquid fuel and bottled gas sectors in Portugal. March 2009.
[19] Canadian Competition Bureau (2014). Propane Market Review. April 25, 2014.
[20] South African Competition Commission (2017). Market Inquiry into the LPG Sector. March 2017.

To harness positive network externalities	• In jurisdictions where the natural gas network is not ubiquitous or has limited coverage, policies to ensure secure and fair access to LPG might be considered important to promote economic and social development.
Economic and societal importance of services	• In jurisdictions where the natural gas network is not ubiquitous or has limited coverage, policies to ensure fair access to LPG may be important to ensure the health, safety or wellbeing of the population (e.g. allowing households to heat or cool home, cook, access hot water etc).
Affordability and distributional concerns	• In many industrialized countries, household's that rely on LPG for gas supply tend to be less well-off. LPG is typically more expensive than most other fuels and natural gas and its prices on the world market are also highly volatile, making regular use of LPG challenging for many households particularly those that are not well-off. Policy interventions may therefore seek to protect LPG consumers from excessive prices which deviate substantially from underlying costs or from rapid or unexpected price changes.
Limited or weak demand side pressure	• In some jurisdictions customers (including retailers/sub-distributors and end-users) have displayed a limited willingness to search or switch. This could motivate the introduction of policy measures that reduce contractual lock-in clauses and more broadly promote greater customer information and search behavior.
Low levels of competitive intensity	• Policy measures in some jurisdictions has focused on intensifying competitive rivalry among LPG suppliers. This has included demand side measures to promote greater consumer engagement, but also in some cases price regulation or oversight.

(b) Examples of additional policy measures introduced in LPG supply in other jurisdictions

62. Perhaps because of the points noted in the preceding paragraph, there has been a number of investigations and market studies by competition authorities and other policy bodies into LPG supply in different parts of the world, particularly in jurisdictions where a large proportion of the population is dependent on LPG as their main source of gas supply.

63. The discussion in this section presents examples of the types of additional policy measures that have been introduced in LPG markets in selected jurisdictions. The discussion is not intended to be comprehensive but rather to provide an overview of the types of policy measures that have been used in practice. The policy measures are organised under five headings:

- Interventions which involve the on-going monitoring or regulation of LPG prices.
- Investigations by competition agencies in relation to coordinated or parallel pricing in LPG supply.
- Non-price related interventions in LPG markets (e.g.: to address contractual terms or exclusivity arrangements).

- Interventions to address weak or limited demand side pressure.
- Structural interventions in LPG markets.

64. Table 4 below presents examples of jurisdictions where some form of on-going regulatory oversight of LPG prices is applied. Given the different contexts and motivation for price regulation, the table excludes a number of countries that have introduced subsidies in the form of maximum price regulations in order to encourage a shift away from alternative fuel sources (such as wood) to LPG.[21]

Table 4: Ongoing monitoring or regulation of LPG prices

Country/ jurisdiction	Discussion
Canada	• Retail propane (LPG) prices are regulated to varying degrees in five Canadian provinces (British Columbia, New Brunswick; Manitoba, Prince Edward Island and Newfoundland). Regulation often takes the form of maximum prices based on maximum mark-ups to posted wholesale prices. Accordingly, regulated prices fluctuate in response to changes in the market.
Portugal	• Since 2020, fixed price controls for LPG cylinders have been introduced in response to the increase in the marketing margins of retail operators.
Spain	• LPG prices are controlled by means of a price cap formula, which is reviewed quarterly for raw materials and transport costs, and yearly for commercialization costs.
USA	• In some states, (such as Texas, Colorado, Michigan, Montana and Nevada), suppliers of LPG (propane) through a piping system to at least 10 customers are classified as distribution system retailers and subject to ratemaking jurisdiction of the regulator. In other states, such as Connecticut and Massachusetts, LPG pricing is monitored and the regulator/government agency disseminates pricing information to consumers. The United States Department of Energy also conducts surveys of average propane prices which it publishes on the Internet.
Botswana	• Since 2016 a regulatory body is responsible for ensuring that tariffs in the regulated sector are fixed on the basis of a tariff methodology that has been set up in a transparent manner taking into account policy on cross subsidies between classes of consumers.
South Africa	• Maximum LPG wholesale and retail prices are set by the Department of Energy.

65. In some jurisdictions concerns have been raised about potential anti-competitive pricing by LPG suppliers, including coordinated pricing and tacit collusion. Table 5 provides an overview of some examples of where competition agencies have raised such concerns or conducted investigations into this issue.

Table 5: Investigations by competition agencies in relation to coordinated or parallel pricing in LPG supply

Country/ jurisdiction	Discussion
Korea	• A 2009 investigation by the Korean Fair Trade Commission found that seven LPG suppliers had fixed wholesale prices in the period between 2003 and 2008.
Taiwan	• There have been various findings of concerted actions in the Taiwanese market. A 2000 decision by the Fair Trade Commission found that there was concerted

[21] See World Bank (2021). Subzidizing Bottled Gas: Approaches and Effects on Household Use. June 2021.

	action to raise the price for cylinder LPG by three suppliers. A subsequent 2001 decision found that 27 LPG cylinder distributors in southern Taiwan had engaging in concerted action to raise fees for delivery and filling services and to raise the price of cylindered LPG. In 2002, the Fair-Trade Commission investigated concerted actions in increasing sales margins on the part of nine LPG distributors.
Portugal	• A 2009 Market Study found evidence of visible parallel behaviour involving both the major oil companies and independent operators. However, it concluded that given EC law it would be difficult to prove to a court that it was an example of concerted practices, and so it recommended that structural, regulatory and behavioural features be introduced to ensure stronger market contestability. • A subsequent 2017 study by the Competition Agency found that although LPG import costs decreased significantly since 2014, the pace of the retail price decrease was slower than that of import costs, leading to the growth of gross margins. The analysis also found that the wholesale prices of bottled LPG of the two largest operators (accounting for more than two thirds of supply) are generally similar. The profit margins associated with the pricing strategy of the main market players showed that they exercise market power to some extent, and that this likely followed from the high degree of concentration in the market together with the rigidity of demand for bottled gas with respect to price.
South Africa	• A 2017 Market Inquiry by the South African Competition Commission noted that high market concentration amongst the wholesalers is fostering an environment which is conducive for coordination.
Canada	• A 2014 Market Review investigated whether high LPG (propane) prices were the result of anti-competitive behaviour, including tacit collusion. It noted that as propane is an essential good for some consumers, any such anti-competitive activities would be likely to have substantial negative effects. It concluded that there was not sufficient evidence available, at that time, to support the finding that anti-competitive activities have exacerbated the impact of recent propane price spikes on consumers. However, it also noted that its examination was limited by certain factors.
UK	• A 2011 Market study considered complaints from LPG consumers alleging that prices are excessively high and rising. Its analysis found large variations in prices in some parts of the UK and that such price variations in some areas reflected limited competition. It suggested that consumers should either have some form of contractual protection against price variation (for example price limits) or they should be able to cancel the contract on reasonable terms if the price varies significantly.

66. Policy interventions have also focussed on the non-price aspects of the LPG supply arrangements which could be adversely affecting competition and customers, such as unduly long-term or evergreen contracts, exclusivity, or other vertical restraints. Table 6 presents examples of where such issues have been raised and the types of policy measures that have been proposed or introduced in response.

Table 6: Non-price related interventions into LPG supply

Country/ jurisdiction	Discussion
France	• A 2014 study by the French Competition Agency found rigidity in the structure of the contracts involving the distribution of bulk LPG between suppliers and households. It found that these contracts effectively imposed obligations to combine gas supply with other services such as the supply of the tank and

	maintenance work; were generally of a very long duration (3 to 9 years); and contain stipulations making them difficult to terminate. Contracts were also opaque from the cost perspective. It set out five recommendations to address these concerns, including allowing customers to seek supply from their provider of choice; separating the supply of gas an ad hoc contract from other services (such as equipment maintenance and monitoring or tank supply; allowing consumers to buy an LPG tank and have it maintained by a company of their choice; separating the different cost components in the supply agreement, so customers can make their choices in full knowledge of the facts; strengthening tariff transparency by publishing all current contracts and scales on the companies' websites; and limiting the total duration of contracts relating to the supply of tanks and their upkeep to five years).
Portugal	• In 2015, the competition agency issued a decision against companies for anticompetitive practices in the Portuguese bottled LPG market, namely in contracts with restricted the ability of distributors from selling bottled LPG outside their allocated territory thereby stifling intra-brand competition between these distributors. In 2019 a new regulation was introduced with the aim of fostering competition in the sale of cylinder LPG by establishing a cylinder exchange mechanism
UK	• A 2011 Market study considered concerns about contractual arrangements between LPG cylinder suppliers and dealers, and also about contract terms for bulk LPG, including lock-in periods, and the use of certain low introductory tariffs but are then locked in (e.g.: tease and squeeze strategies). It recommended that policies be targeted at specific LPG consumers to encourage them to search. • An earlier 2006 Market Investigation into Domestic bulk LPG found evidence of contractual restrictions on switching, which included lengthy fixed minimum terms in introductory contracts and selective discounting to customers. To address its concerns policy measures introduced included providing for a timely tank transfer or removal process at no cost to the customer, standardising and improving the information suppliers must provide to their customers on the switching process, and changes to all customer contracts to enable easier switching.
Botswana	• A 2018 Market Study by the competition agency found that exclusive supply agreements between importers and distributors were of a long duration which made it difficult for new entrants (at distribution level) to venture into the market. It found that most distributors were unable to switch suppliers easily as importers own the equipment, while the distributors provide the land which had the connotation of exclusive supply. It also found problems with vertical integration since the importers own the equipment used by the distributors, and, in-turn 70% of the distributors own or are somehow affiliated with retailers' country wide, this could make market entry by new firms difficult, and could facilitate a culture of anti-competitive behaviour.
South Africa	• A 2017 Market Inquiry by the South African Competition Commission found that refineries prefer long-term supply agreements, and that problems in securing supplies of LPG from refineries pose a significant barrier to entry for wholesalers. It noted that the ability of competitors to enter and/or expand at the wholesale level may be affected negatively due to foreclosure of supply. Among other things it found that the the duration of the contracts was long with some agreements renewed with the same wholesaler for over 25 years, and that contracts exist with some of the large wholesalers including unlimited renewal clauses. These clauses have the effect of creating "evergreen contracts", thus entrenching incumbency advantages for the parties involved. Some long-term supply agreements contained incentives such as provisions for discounts on

	wholesale prices of up to 10%. To address these concerns the Commission recommended that contracts be limited to 10 years and that all automatic renewal clauses must be removed from all supply agreements. To improve LPG access to small wholesalers, refineries must now allocate a minimum of ten percent LPG production (excluding internal consumption) to small wholesalers on at least two-year supply agreements. In the cylinder market it found that the cylinder exchange practice acts as a potential barrier to entry into the cylinder market as it is governed through bilateral agreements and these agreements have made participation by new entrants difficult.

67. Policy interventions have also focussed on the weak customer or demand side pressure in some jurisdictions and have sought to address obstacles or barriers that customers face when searching the market or switching LPG supplier. Table 7 presents examples of policy interventions intended to make consumers more active in the market.

Table 7: Interventions to address limited or weak demand pressure in LPG supply

Country/ jurisdiction	Discussion
Canada	• A 2014 Market Review found that once a consumer chooses to use LPG, significant investments must be made to acquire equipment and appliances that are specifically designed to use LPG only. As a result, these consumers cannot easily switch to other fuels in the short term and have limited options when prices rise.
USA	• A 2011 government study in Connecticut found that consumers often found that terms and conditions of the contracts to be vague or allow dealers to make changes to various fees with little to no notice to the consumer. As such consumers may be agreeing to items in contracts without any awareness or full understanding of the implications. It recommended various changes to contracts to address this.
UK	• A 2011 Market Study into Off-grid fuels concluded that many cylinder LPG consumers are in practice unable to readily switch to alternative methods of heating or to bulk LPG and faced above average heating costs. Although there are numerous dealers and retailers, in practice consumers perceived there to be limited choice, and as such it found little evidence of consumers switching between retailers. Given the small size of the affected population it recommended that policies be targeted at specific LPG consumers which encouraged them to search. • An earlier 2006 Market Investigation into Domestic bulk LPG found evidence of weak competition and that each year only around three per cent of the major suppliers' customers ended their supply arrangements, and that only one in six of these (0.5 per cent of the customer base) did so to switch to an alternative LPG supplier. It identified a number of features which resulted in weak competition including: up-front charges to customers; poor customer information about switching; pricing information from other LPG suppliers was difficult to obtain; and, in some cases, customers incurred search costs for finding a cheaper supplier. In response it introduced measures to reduce customer lock-in and facilitate switching including standardising and improving the information suppliers must provide to their customers on the switching process, and changes to all customer contracts to enable easier switching.
Australia	• Some states, such as Victoria, have established LPG retail codes which prescribe minimum standard service levels that LPG Retailers should meet when selling

	LPG to household customers. This is intended to protect consumers and allow them to understand their rights, including in terms of termination etc.
South Africa	• A 2017 Market Inquiry by the South African Competition Commission found some evidence of switching for bulk LPG, but noted that it does not take place seamlessly and the supply arrangements were structured in a vague manner that does not facilitate switching. It made various recommendations to address these concerns.

68. Finally, concerns have been raised about the LPG supply structure across several jurisdictions, including high levels of concentration and vertical integration. Table 8 below summarises the structural concerns that have been identified and what policy measures have been proposed or implemented to address these concerns.

Table 8: Structural concerns and interventions in LPG supply

Country/ jurisdiction	Discussion
Portugal	• A 2017 study by the Portuguese Competition Agency found that the bottled LPG industry is concentrated in a small number of market players, with a stability in the market shares of the main players over time which is consistent with a lack of competitive pressure. It also identified barriers to entry and expansion in the distribution of bottled LPG which was likely to reduce the competitive pressure in the market. Important among these was access to LPG storage facilities where the three main market players, currently control the ownership of the entire share capital of the storage facilities. To address these structural barriers to entry and expansion, the study recommended that the Portuguese Government grant a public interest status to the Perafita and Sines storage facilities, such as that established for the CLC storage facility, to ensure that negotiated access to these storage facilities.
France	• A 2014 study by the French Competition Agency found that the oligopolistic structure of the sector – in which more than 90% of supply comes from five companies Antargaz, Butagaz, Primagaz, Totalgaz and Vitogaz – created rigidity in the market as a result of the structure of the contracts that the LPG companies enter into with households.
Spain	• Some commentators have suggested that there are high levels of industry concentration due to Butano Respol's control over the industry. This is seen as a significant barrier to entry, as entrants must compete against a vertically integrated market leader that controls much of the production and importation, and also the activities of bottling and end distribution.
UK	• A 2011 Market Study into Off-grid fuels concluded that there are few cylinder LPG suppliers upstream and some domestic cylinder LPG users have a limited choice of retailers downstream. Furthermore, it found that distribution and retail arrangements for cylinder LPG are heavily constrained by vertical agreements and the concentration in the upstream market these agreements could potentially restrict competition. The competition authority noted that it may return to these issues in the context of the wider cylinder LPG market study at a later date
Pakistan	• A 2020 competition assessment by the Competition Commission of Pakistan found various barriers to entry and expansion that restrict/reduce and distort competition in the sector at various levels. It also found evidence of anti-competitive and illegal business practices carried out by LPG dealers. It recommended that LPG dealers by subject to monitoring by a regulatory authority.

Botswana	• A 2018 Market Study by the competition authority found that the LPG market's oligopolistic nature made it vulnerable to anti-competitive behaviour and highlighted a need for effective regulation.
South Africa	• A 2017 Market Inquiry by the South African Competition Commission found that the market is highly concentrated with four large wholesalers accounting for significant market share. It also found that new entrants and small existing firms must overcome high barriers to entry in the wholesale markets. It also noted that some of the wholesalers were vertically integrated with refineries in the past and have maintained these relationships.

3.4 Summary

69. This section provided a general overview of *why* policy measures might be necessary in LPG markets, and presented some examples from international experience of the types of measures that have been implemented or contemplated. Four main points emerge from the discussion.

70. First, various factors motivate the introduction of additional policy measures in some industries, or activities within an industry. Common motivating factors include to: improve economic efficiency; control unilateral or collective market power; harness positive externalities; take account of the economic and societal importance of some products and services or to address fairness and distributional concerns; address weak or limited demand side pressure; and to improve the competitive intensity of an industry.

71. Second, in many jurisdictions, including Chile, the main rationales for policy interventions in natural gas supply include to enhance economic efficiency, control monopoly power and because access to energy is seen as an essential service and there is a need to ensure that the price of natural gas is fair and affordable. To achieve these objectives policy measures in the form of on-going regulation of prices and other terms is often applied to the transportation, distribution and storage of natural gas.

72. In contrast, the type and extent of policy interventions in the LPG supply chain are more varied than those applied to natural gas supply. In jurisdictions where LPG represents the major, or only, gas source for many or a majority of end-users such as Chile, policy intervention might be warranted because: of concerns about high levels of concentration in LPG supply and collective market power; access to LPG is considered essential for a large proportion of the population who do not access to grid/pipeline supplied natural gas; to ensure that the price of LPG remains affordable, particularly given high levels of consumption by lower income households; and to address the limited demand side pressure exerted from sub-distributors and end-users.

73. Finally, a brief survey of competition investigations and market studies into LPG supply in different parts of the world, reveals that a range of policy measures have been introduced to enhance competition and address specific competition issues identified in these countries. These include: on-going monitoring or regulation of LPG prices; investigations

and prosecutions in relation to coordinated or parallel pricing in LPG supply; non-price related interventions in LPG markets; interventions aimed at increasing demand side pressure; and various structural interventions.

4. Policy alternatives to address the risks of the horizontal integration of LPG and natural gas

74. This section considers possible policy alternatives that could be introduced to address the risk to competition arising from the horizontal cross-ownership and control (horizontal integration) of LPG and natural gas distributors in some municipalities in Chile. The discussion is structured under three headings:

- I first set out my understanding of the factual context and the findings of FNE with respect to the effects of the horizontal integration of LPG and natural gas distributors.

- I then set out possible reasons why policy intervention may be warranted to address the risk that horizontal integration may be adversely impacting on competition.

- Third, I describe, in a general way, possible policy alternatives that could be introduced to mitigate the risks to competition of horizontal integration.

4.1 The effects of the current horizontal integration of LPG and natural gas

75. As section out in section 2, there are 70 municipalities in Chile where the users have a choice between natural gas supply and LPG distribution, and in some of these municipalities the operator of the natural gas network is also involved in the distribution of LPG. The FNE's analysis found that in those municipalities where there is horizontal integration the prices for LPG were, on average, higher than in non-integrated municipalities.

76. Implicit in this analysis and findings are two assumptions.

- First that natural gas and LPG are to some degree substitutes for one another from the end-user perspective. In other words, it is assumed that the relative prices of LPG and natural gas will affect the decisions of some customers at the margin, such that a significant and non-transitory increase in the price of LPG might be expected to result in some customers switching some consumption away from LPG to natural gas (if they are connected to the natural gas network), or seeking a connection to the natural gas network if they are not already connected.

- Second, it is assumed that any increase in the price of LPG by the horizontally integrated operator can be sustained without customers switching to an alternative non-horizontally integrated LPG distributor in that municipality.

77. I have not been asked to assess the veracity of these assumptions or the FNE's findings about relative substitutability between LPG and natural gas. For the purposes of the discussion that follows I have therefore adopted the FNE's finding that LPG and natural gas are substitutes for one another, and that in those municipalities where operators are horizontally integrated there is a risk that this could be having an adverse effect on competition.

4.2 Why intervene to address horizontal integration?

78. In some cases where a single operator is engaged in the supply of two potentially substitutable services, and holds a position of significant market power in the supply of one or both of those services, it may have an ability and incentive to supply the services in such a way so as to maximise its profits across the two products. This could involve increasing the price, or restricting supply, for one or both products.

79. From a competition perspective the chief concern is that the horizontally integrated operator will not make decisions about the price and non-prices terms of supply for each service independently. Rather it will consider how the terms of supply for one service will impact that the demand and profitability of the other service. In other words, decisions will be taken which maximize the joint profits from the sale of both services – in this case, LPG and natural gas. In effect, the horizontally integrated operator acts as if there is an internal horizontal agreement between its natural gas supply division and its LPG division.

80. Where a horizontally integrated operator with market power has control over substitute services this can have a number of adverse effects on competition and consumers:

- It can result in an inefficient allocation of goods and services and thus harm (static) economic efficiency. Put simply, by removing the competitive constraint of the substitute service a horizontally integrated operator can, in some settings, have the ability and incentive to set price terms for one or both services which deviate from the underlying costs of supplying those services.

- It can allow the horizontally integrated operator to take advantage of any significant market power it has in the supply of one or both services. In other words, an integrated operator who is the sole supplier of natural gas in a municipality and also holds a position of significant market power in the supply of LPG may be in a position raise the prices for such services without the threat of a competitive response. This results in a direct transfer of wealth from consumers to the integrated operator.

- It can potentially harm dynamic economic efficiency by allowing the horizontally integrated operator to leverage its position of significant market power or monopoly in the supply of one service (e.g.: natural gas distribution) into another service where

there is potential for competition. For example, the integrated operator might seek to deter competition developing for the substitute service (e.g.: LPG) by threatening to reduce prices (for LPG or natural gas) if an entrant gains a strong position in LPG supply in a specific municipality. Critically, even the *threat* of such action by the integrated operator can act as a barrier to entry into the competitive activity.

- It can also harm dynamic efficiency by changing the incentives of the horizontally integrated operator to invest or expand in one or both of the services if the result of such investments is to reduce overall joint revenues. For example, a horizontally integrated operator might not have strong incentives to encourage connections to the natural gas network if the result is a cannibalization of the higher margins it obtains from the supply of LPG.

- Finally, where one service is regulated (such as natural gas supply) the horizontally integrated operator might seek to shift or allocate costs associated with the non-regulated service (LPG supply) into the cost base of the regulated service. This can either increase its profit in the regulated service, or undercut or distort competition in the supply of the non-regulated service. It can also allow the horizontally integrated operator to foreclose entrants in the competitive activity by charging prices below the attributable costs of supply for that service.

81. Concerns about the potential adverse effects of horizontal integration are well understood in competition and regulatory economics. At a general policy level, there are restrictions in most jurisdictions on the ability of suppliers of substitute products entering into horizontal agreements about the conditions of the supply of those services (i.e.: effectively horizontally integrating the supply of their services). Similarly, when two suppliers of substitute services seek to merge with one another, and one or both the suppliers have market power, then this is typically subject to close scrutiny by competition authorities because of the potential adverse impacts it can have on competition.

82. In addition to these policies which apply across the economy, in many essential service industries – such as energy, communications, transport and water – additional policy measures have been introduced in some countries to address specific concerns about horizontal integration in those industries. Table 9 below provides a high-level overview of where such concerns have arisen in other sectors.

Table 9: Concerns about horizontal integration in other essential service industries

Sector	Discussion
Gas	• Concerns that the common ownership of storage facilities by other parties in the supply chain (e.g.: gas transportation companies) could reduce the independence of storage system operators have arisen in some jurisdictions such as the EU. • In some jurisdictions (such as Australia) concerns have arisen that operators of multiple gas pipelines might use revenues earned from

	regulated services to cross-subsidise contestable services, including those services not subject to regulation.
Electricity	• In electricity generation horizontal structural separation was introduced in the UK and some states of Australia with the aim of creating the conditions where generators (using different fuel sources) compete with one another. • More recently, concerns have also arisen in some jurisdictions about the cross-ownership of large-scale electricity storage facilities by other parties in the electricity supply chain, and in some cases local distribution utilities are prohibited from owning any storage resources.
Telecoms	• Concerns have arisen in the past in the EU that the integration of telecommunications and cable network operators might be adverse to competition as the services provided on these infrastructures were seen as potential substitutes for one another, and that cable television providers and telecommunications companies were probably the most likely entrants into each other's markets.
Post	• Concerns about horizontal integration in the postal sector have focused on the fact that most postal incumbents are also active in the supply of unregulated activities such as express mail or parcel delivery. Here the concern is that the integrated firm will allocate costs between the regulated and unregulated activities in such a way as to distort competition.
Rail	• In some jurisdictions, policies have been introduced which separate the provision of passenger and freight services. The aim of such policies has been to avoid the cross subsidy of one set of services by another set of services and thus distort competition and investment decisions.
Aviation	• In some jurisdictions, such as the UK, policies have involved the mandated horizontal separation of airports in certain areas (e.g.: London) which could potentially compete with one another.
Water	• In some jurisdictions, such as England and Wales, where there are separate regional water companies, rules prohibit the horizontal merger between certain water companies. The aim of such policies has, in part, to allow for a form of benchmarking competition.
Digital platforms	• In a number of jurisdictions, such as the US and the EU, concerns have arisen about the ability of dominant multi-platform conglomerates that supply services across several product and service markets to strategically cross-leverage their position to block entry by more focused or emerging rivals. A related structural policy concern has involved the 'unwinding' of consummated mergers that have caused higher prices or lessened competition including past horizontal mergers between a digital platform and a potential competitor that supply similar services (e.g.. Facebook and Instagram).

4.3 Policy alternatives to address the risks of horizontal integration

83. A range of policies could, in principle, be introduced to address the risk to competition of horizontal integration. These measures can range from full ownership or line of business separation policies, which would prohibit the cross-ownership or control of substitutable services, to policies which allow the horizontally integrated operator to remain active in the supply of the substitutable services on the condition that they introduce various ring-fencing or other separation requirements. All of these interventions are directed at

addressing the ability and incentive of a horizontally integrated operator to supply the substitutable services in ways that adversely impact on efficiency, competition and customers. Broadly speaking, two types of policy interventions could be introduced:

- Behavioural interventions which can involve the integrated operator committing to certain obligations and/or monitoring arrangements.[22]

- Structural interventions which require changes to the ownership or operational structure of the horizontally integrated operator.

84. I have not been asked to assess the appropriateness of the various policy alternatives set out below to mitigate the risk that horizontal integration in the specific context of Chile. Rather the purpose of the discussion is to highlight in a general way the potential policy options (including policies that have been used in other contexts) that could be introduced to address concerns about the potential risk of horizontal integration.

(a) Behavioural policy interventions

85. One set of policy alternatives to mitigate the risk of horizontal integration having adverse effects on competition involves the imposition of certain 'behavioural' obligations or requirements on the horizontally integrated operator. These behavioural interventions have the aim of mitigating the ability or incentive of the integrated operator to take advantage of its position in the supply of the substitute services.

86. Behavioural policies could involve legal commitments on the part of the horizontally integrated entity not to share sensitive operational or financial information about LPG and natural gas across business units, or to ensure the operational autonomy of decision-making bodies and to limit the access that key staff have to certain information. These commitments could be subject to ongoing monitoring by an external body. The aim of such policies is to encourage greater independence in the decision making regarding the supply of LPG and natural gas. If the penalties for breaching such provisions are an effective deterrent then such policies could change the incentives of the integrated entity in terms of how it sets the prices for LPG and natural gas, and the incentives to expand the natural gas network.

87. Behavioural policies might also involve the horizontally integrated entity committing to certain service standards or targets regarding service quality and network expansion. For example, the integrated entity might commit to honouring any reasonable request made by a customer that wants to connect to the natural gas network. Alternatively, the integrated operator might set out a commitment, and a plan, for the long-term expansion of the natural gas network.

[22] These are sometimes called undertakings or behavioural undertakings in other jurisdictions.

88. A principal advantage of such behavioural policy interventions is that they can be tailored to the specific risks/problems identified and involve minimal restructuring costs. The principal disadvantage of such policies is that they can involve high levels of on-going reporting and monitoring costs, and may be insufficient to change the incentives of the integrated operator with regards to the pricing of LPG and natural gas and the expansion of the network.

(b) Structural policy interventions

89. Another set of policy alternatives to mitigate the risk of horizontal integration having adverse effects on competition is structural in nature and would involve the separation of the LPG operations from the natural gas operations. Structural separation policies are often introduced where it considered that behavioural interventions would be insufficient to mitigate the risks of horizontal integration; in other words, where behavioural interventions are unlikely to materially change the ability or incentive of the integrated operator to take advantage of its position in the supply of the substitute services.

90. Broadly speaking three different forms of separation requirements could, in principle, be introduced to address the risks to competition of the horizontal integration of LPG and natural gas supply in some municipalities in Chile, including:

- **Ownership separation or divestment:** Integrated LPG and natural gas operators could be required to divest of their ownership in the supply of one of the services in those municipalities where there is an overlap.

- **Line of business separation/ringfencing:** Integrated LPG and natural gas operators would be required to establish separate business and operating units to supply LPG and natural gas.

- **Accounting separation:** Integrated LPG and natural gas operators would be required to prepare and submit to an appropriate body separate accounts

91. Table 10 describes what each of the above policies might involve; how it could change the incentives or ability of the integrated entity; and examples of other sectors where such policies have been used.

Table 10: Possible structural policy interventions to address the risk to competition of horizontal integration

Form of separation	What might such a policy involve?	How would it change the ability and incentives of the integrated entity?	Examples of implementation of such policies from other industries and jurisdictions
Ownership separation or divestment	• Integrated LPG and natural gas operators would be required to divest of their ownership in the supply of one of the services in municipalities where there is an overlap. That is, they would no longer be able to legally or economically be involved in the supply of LPG if they also supply natural gas in that municipality (or vice versa).	• This policy would completely remove the ability of the integrated operator to charge higher prices or limit its expansion of the network in areas where it provides both services.	• In the UK electricity sector generators were split into three companies at the time of restructuring to promote competition between generators. • In the UK, following a Market Investigation by the Competition Commission, British Airports Authority was required to divest of two London airports to promote competition between airports. • In the US and elsewhere passenger and freight railroad operations have been horizontally separated to ensure that activities are not cross-subsidized. • In many jurisdictions in order to gain approval for a merger it is not uncommon for companies to agree to divest of certain assets or business lines where their activities overlap.
Line of business separation or ringfencing	• Integrated LPG and natural gas operators would be required to establish separate business and operating units to supply LPG and natural gas. Although these business units could remain under common ownership, they would be operated	• If effective this policy could limit the ability and incentive of the integrated operator to charge higher prices or limit its expansion of the network in areas where it provides both services. • However, much will depend on the specifics of the separation policy and	• The EC Cable Directive imposed a requirement that telecommunications services and cable television networks be legally separated. • Under relevant EU gas directives in order to ensure the independence of storage systems it is required that storage facilities

	as individual entities. This would likely involve the use of separate management and remuneration structures for the different businesses, and other operational or 'ringfencing' changes to limit the ability of sensitive information to be shared across the separate business units.	whether it is sufficient to change the ability (e.g.: will ringfencing ensure that information about the sales or expansion of one activity are not shared with the other business unit?) and the incentives (e.g.: will managers be rewarded at the ownership/parent company level or by the individual business unit?) to operate as integrated entity.	are operated through legally separate entities that have effective decision-making rights with respect to assets necessary to maintain, operate and develop storage facilities. • Ringfencing requirements have been applied to gas pipelines in Australia to ensure that revenues earned from regulated services are not used to cross-subsidise contestable unregulated services. • Line of business separation rules are currently being considered in the US in relation to some digital platforms that provide services across several product and service markets
Accounting separation	• Integrated LPG and natural gas operators would be required to prepare and submit to an appropriate body separate accounts which show which costs have been involved in the supply of LPG and natural gas, and how fixed and common costs have been allocated across the two services.	• This policy would not directly affect the ability or the incentive of the integrated operator to charge higher prices or limit its expansion of the network in areas where it provides both services. However, if effective, it could indirectly affect the incentive to engage in such behavior by shining a light on how costs are allocated between regulated and competitive activities (e.g.: natural gas and LPG supply).	• EC directives have in the past required the accounting separation of letter mail postal activities from other services provided in competitive markets (e.g.: express mail)

4.4 Summary

92. The FNE has identified a risk that the horizontal cross-ownership and control of natural gas and LPG in some municipalities may be adversely impacting on competition. Given this risk, policy intervention might be warranted in some circumstances to: ensure an efficient allocation of natural gas and LPG; remove the ability of the horizontally integrated operator to take advantage of its significant market power it has in the supply of one or both services, including its ability to leverage its position in the supply of one service (e.g.: natural gas distribution) into another service where there is some competition (LPG); change the incentives of the horizontally integrated operator to invest or expand in one or both of the services; and reduce the ability of the horizontally integrated operator to shift or allocate costs from the non-regulated service (LPG supply) into the cost base of the regulated service (natural gas).

93. Policy alternatives to mitigate the risk of horizontal integration might involve behavioural interventions (or undertakings) which require the integrated operator to legally commit to certain obligations and submit to ongoing monitoring, or to certain service standards or targets regarding service quality and network expansion.

94. Alternatively, structural policy interventions could be introduced which would involve the separation of the LPG operations from the natural gas operations in those municipalities where there is an overlap. These separation policies might require: the divestment of ownership in the supply of one of the services; line of business separation or ringfencing which would require that separate business and operating units to supply LPG and natural gas are established internally; or requirements for accounting separation.

5. Policy alternatives to intensify competition in LPG supply

95. This section considers policy alternatives that could be introduced to make the LPG market in Chile more competitive and to address the adverse effects on competition identified by the FNE in its Gas Market Study. The discussion is organised under three headings:

- I first set out my understanding of the FNE's findings about state of competition in the supply of LPG, including its findings about the risks of coordination and the vertical supply structure.

- Given these findings, I then set out possible reasons why policy intervention might be necessary to intensify competition in the supply of LPG.

- Third, I describe possible policy alternatives that could be introduced to enhance competition in LPG supply.

5.1 The FNE's findings on current state of competition in LPG supply

96. As discussed in section 2, the FNE has made three findings about competition in the supply of LPG:

- First, the FNE has concluded that there is a risk of coordinated behaviour in the supply of LPG given various structural factors and its analysis of the extent to which historic input cost reductions have been passed through to customers.

- Second, the FNE found evidence that the high levels of vertical integration in LPG supply may be reducing competition. Among other things it found that three companies own or have exclusive access to terminals near ports, operate regasification installations, own the cylinders and trucks that transport bulk LPG, and have exclusivity contracts with more than 5000 sub-distributors.

- Third, it also found that there was limited switching among the sub-distributors, and that less than 2% of the sub-distributors are multi-brand distributors. This low level of sub-distributor switching was attributed to rigid contractual provisions in the vertical supply agreements including the indefinite nature of the supply agreements and the use of incentives to encourage sub-distributors to be exclusive suppliers.

97. I have not been asked to assess the veracity of the evidence or analysis which underlies FNE's findings about the state of competition in the supply of LPG. For the purposes of the discussion that follows I have therefore adopted the FNE's findings that there is a high

risk of coordinated behaviour, and that high levels of vertical integration and other vertical restraints may be reducing the competitive intensity in the supply of LPG.

5.2 Why intervene to intensify competition in LPG supply?

98. There are both general and specific rationales for introducing policy measures to intensify competition in the supply of LPG and address the risks identified by the FNE about the current supply structure.

(a) General rationales for policy intervention in LPG supply

99. The general reasons for policy intervention are directly related to the discussion in Section 3 above, and include the following:

- **To enhance economic efficiency**: high levels of vertical integration among the three main upstream LPG suppliers, coupled with exclusive access to terminals and exclusivity contracts with sub-distributors, could be resulting in higher prices for, or reduced access to, key indispensable inputs in the supply chain for non-integrated suppliers that compete with the three integrated LPG suppliers (such as access to LPG terminals). In addition, exclusivity arrangements, or the use of incentives to encourage sub-distributors to be exclusive suppliers, could reduce the ability and incentives for sub-distributors to switch to alternative suppliers and thus dampen demand side pressure. It can also limit or deter entry by other LPG upstream suppliers at different stages of the supply chain who may be unable to attract a sufficient number of distributors to switch.

- **To mitigate the effects of (collective) market power:** as discussed below to the extent to which the three main upstream LPG suppliers at the national level coordinate or align their behaviour this can result in adverse effects for customers who may face higher prices for LPG, or reduced service quality.

- **LPG is an essential product for many households:** according to the FNE only 21.4% of households have access to the natural gas pipeline network in Chile, with the remainder being heavily reliant on LPG as the primary fuel used for basic household functions such as cooking and heating.

- **To ensure that LPG remains affordable and accessible to those who rely on it:** according to the FNE residential consumers spend a significant proportion of their household budget on gas consumption, equating to up to 19% of total expenditure on basic services. Moreover, only 7.4% of households in the lowest income quintile have access to the natural gas network.

- **To make downstream customers more active and increase countervailing demand side power**: according to the FNE historic switching levels among sub-distributors are very low with only 2% switching over the last nine-years, while over 98% of sub-distributors who supply end-users (such as households) only sell one brand of LPG which limits the ability of end-users to conveniently switch to an alternative supplier. The low level of countervailing demand side pressure by downstream customers can reduce the incentives that the three major LPG suppliers have to respond to customer demands and may allow them to coordinate or align their behaviour without the threat of countervailing buyer power.

100. More specific reasons for intervention derive from the findings of the FNE Market Study and relate to:

- the risks of coordination among the three main LPG upstream suppliers;
- the effects of vertical integration; and
- the impacts of vertical agreements of vertical restraints (such as exclusivity contracts or loyalty incentives) between upstream LPG suppliers and downstream customers.

(b) Specific rationale based on the risk of coordination

101. When competitors align their behaviour or coordinate (either explicitly or implicitly/tacitly) on price and other key terms of trade this will generally create distortions to resource allocation, efficiency and distribution. These adverse effects arise because firms that coordinate or tacitly align their behaviour effectively adopt a common policy on the market to maximise joint profits; that is, they no longer act independently. For this reason the effects of coordination can be equivalent to the effects of monopoly in terms of impacts on competition, efficiency, innovation and consumers. It is this potential for firms in oligopolistic markets to coordinate or align their behaviour in ways which has effects similar to a monopoly which is known in the economic literature as the 'oligopoly problem'.

102. Tying this back to the FNE's findings about the supply of LPG in Chile, this suggests that a specific reason for policy intervention might be to address the risks of coordination among the three main LPG suppliers which could give rise to adverse impacts on competition, efficiency and consumers.

(c) Specific rationale based on high levels of vertical integration

103. A substantial, body of literature has examined the pro and anti-competitive effects of vertical integration across different industries, including the gas industry. Broadly speaking, vertical integration can be efficient where: there are economies of scope in

combining different activities in the supply chain in a single entity; there is a need for high-levels of coordination of operational and investment decisions; and where firms operating at different stages of a supply chain make relationship-specific investments and there is a risk of '*ex post*' opportunism or hold up once those investments are made.

104. Conversely, vertical integration can be inefficient and harmful to competition where a firm has market power in one or more activity in the supply chain such that it can affect the degree of competition in related competitive activities. In these circumstances, a vertically integrated operator may have the ability and incentive to use its market position in that activity to discriminate in favour of its associated business in a related competitive activity and thus foreclose rivals. Critically, even if a vertically integrated firm does not actually engage in such price and non-price discrimination practices, the *expectation* that the firm may engage in such behaviour can itself act to deter entry, and the development of competition, in related activities.

105. Applying this to the current context suggests that policy action may be motivated to address the concerns identified by the FNE about the high levels of vertical integration among the three main upstream LPG suppliers who and have exclusive access to terminals near ports and exclusivity contracts with distributors. These conditions could potentially act to the detriment to the development of competition by reducing the ability of non-integrated rivals to compete on equivalent terms, or deterring entry by new operators at different stages of the supply chain.

(d) Specific rationale based on vertical restraints

106. Vertical agreements, or vertical restraints, are common practices in business and represent attempts by firms to co-ordinate activities with suppliers or buyers lying at different stages of the supply chain. Typically, vertical agreements place some restrictions (restraints) on the commercial freedom of one or both of the parties, such as restrictions relating to the ability of a firm to purchase, sell or re-sell its goods or services. When used by firms without market power, vertical agreements can benefit consumers by improving the efficiency with which products or services are supplied to end-users. However, where a firm with significant market power enters into a vertical agreements with suppliers/distributors the primary competition concern is usually associated with a perceived lack of *inter-brand* competition. In other words, the concern is that the operator may seek to use their relationship with their suppliers or distributors in such a way so as to foreclose existing or potential competitors, or to increase their market power (e.g: by requiring exclusivity, or providing non-volume based incentives or payments to encourage loyalty).

107. Competition concerns can also arise where a group of operators enter into a network of similar vertical agreements with a supplier/distributor. This is because the cumulative

impact of such agreements can be similar to that as if it was entered into by a firm(s) with significant market power. This is especially the case for networks of exclusive purchasing agreements where, for example, a large number of retail outlets are tied exclusively to a single or small set of suppliers. In this example, although each agreement in isolation may not have an adverse effect on competition, in combination, the cumulative effect of these agreements might be to foreclose the market to new suppliers.

108. Applying this to the FNE's findings suggests that policy interventions might be targeted at certain aspects of the vertical supply arrangements between the three upstream LPG operators and sub-distributors including those involving the use of incentives to encourage sub-distributors to be exclusive suppliers, or which otherwise 'lock-in' the sub-distributors to a particular provider.

5.3 Policy alternatives to intensify competition in LPG supply

109. In principle, various policies could be introduced to intensify competition in the supply of LPG and address the concerns identified by the FNE in its Gas Market Study. As with the discussion in section 4, these policy interventions can be broadly classified into behavioural interventions (which involve specific measures intended to change the behaviour or conduct of LPG suppliers) or structural interventions (which involve changes to the ownership or operational structure of the LPG supply chain).

(a) Policy measures to address the risks of coordination among the major LPG suppliers

110. Broadly speaking there are two ways of addressing the risks of coordination or concerted action in tightly oligopolistic industries. One approach involves the *ex post* enforcement of competition law to prosecute suppliers that have been involved in such coordination. Table 5 above summarised examples of investigations or prosecutions by competition agencies in Korea, Portugal, South Africa and Taiwan in relation to coordinated or parallel pricing in LPG supply. An advantage of this approach is that interventions are targeted and occur only where there is evidence of coordinated behaviour or concerted action. It also reduces the risks and costs associated with developing and implementing *ex ante* or on-going policy measures to address the risk of coordination.

111. I am not familiar with the specific legal provisions relating to concerted action or coordination in Chile, however, at a general level there are two major limitations in relying on this *ex post* approach to deal with coordination. First, in some jurisdictions there can be significant evidential challenges associated with brining a legal case particularly where the coordination is tacit or implicit.[23] An appreciation of these challenges can affect the incentives of firms that might engage in such conduct (who may feel that they can 'get

[23] Unlike in cases of explicit collusion there is generally no 'smoking gun' or documented record of the decision to coordinate.

away' with such conduct), as well as rivals or potential entrants into an industry (who may feel that the law will not protect them against such behaviour). That said, there are examples of such actions successfully being brought in some jurisdictions (see table 5). A second limitation of this approach is that enforcement only occurs *after* the harm associated with coordination has occurred. In other words, customers will have already experienced higher prices, or had less choice and competition as a result of the coordination.

112. An alternative set of policies seek to address the risks of coordination arising in the first place either through on-going monitoring or specific rules. In general terms these policies might involve:

- Structural measures which seek to disrupt the close symmetry of the operations of the incumbent LPG operators, for example, through policies which require the divestment of assets to create a new independent competitor.

- Monitoring arrangements which require the LPG operators to provide detailed information to an external body on an on-going basis about how prices have been formed, and how they have responded to changes in input prices etc.

- Periodic, or ad hoc, reviews of competition between LPG operators which might require the LPG operators to demonstrate to a competition authority that they are acting independently and not aligning their coordinating their behaviour, or show how they have responded to changes in material circumstances (e.g.: wholesale price reductions or changes in demand).

- Sector specific rules relating to market manipulation or market abuse which place additional legal restrictions on the ability of the LPG operators to coordinate their behaviour.

- Price regulation including the introduction of maximum retail prices, or the introduction a standard or default LPG price cap which is periodically adjusted to reflect changes in underlying wholesale prices.

113. Table 11 below describes these measures in more detail, including the potential benefits and limitations of each approach and examples of where these approaches have been considered or applied in practice. This is intended to be a general analysis of the different policy options and, as noted in paragraph 19, does not provide an assessment of the likely appropriateness or effectiveness of these policy measures to the specific context of LPG supply in Chile.

Table 11: Possible policy measures to address the risks of coordination

Policy measure	What might such a policy involve?	How could it mitigate the risk of coordination and what are it limitations?	Examples of implementation of similar policies
Forced divestment or separation to create an independent competitor	• Structural measures could be introduced which have the effect of creating a new competitor to challenge the incumbent providers. These measures might involve the existing LPG companies agreeing to transfer, or divest of, some assets into a new separate entity.	• As the new entity will not be aligned with the existing incumbent LPG suppliers it should not have the same incentives and could thus act to destabilize any efforts by the incumbents to coordinate behavior (i.e.: it could act like a 'maverick'). • However, the effectiveness of such a policy will depend on the underlying structural conditions and degree of symmetry between a new competitor and the incumbent operators. If the new competitor faces the same structural conditions and is sufficiently similar to the incumbents then, over time, it may choose to coordinate its behavior alongside the incumbents.	• Policies involving the mandated divestment of assets have been introduced to encourage greater competition in some markets (such as electricity generation or airports) including to address concerns about coordinated behavior. • In the UK, the concerns about coordination between three large cement companies led to requirements for divestment to create a new independent cement producer. • Forced divestments are sometimes a condition for the approval of a merger in some industries where there are concerns about potential coordination.
On-going market monitoring	• An on-going monitoring regime could be introduced which would require the main operators to periodically provide information about the prices they charge, relevant input costs and how they determine those prices to a regulatory body or external agency.	• Given that they will have to submit detailed information about how they set and establish prices to an external body this can reduce the incentives for LPG suppliers to engage in coordination. For example, they will have to justify why it is that they have all not passed through any significant wholesale price reductions into retail prices. • The principal limitation of this approach is the information asymmetry between the LPG operators and the regulatory body which gives rise to the potential for gaming. It could also potentially impose a substantial reporting burden on the LPG operators and the regulator	• In some jurisdictions, markets such as petrol and energy are subject to similar on-going monitoring regimes. • As described in table 4, LPG retail prices are monitored in some US states.

		which may be disproportionate to the risks involved.	
Periodic or ad hoc review of competition between LPG operators	• Certain LPG operators could be required to periodically (e.g.: every three years) submit evidence to show that they are not coordinating their conduct in LPG supply notwithstanding the structural characteristics. • Alternatively, LPG operators could be required to make a submission on an ad hoc basis to a regulator or competition authority, for example whenever a material event arises, such as a major increase or decrease in wholesale international prices, or a major change in demand.	• The requirement to periodically show, and justify to an external body such as a competition authority, that they are not coordinating their behavior could change the incentives of the LPG suppliers to coordinate their behaviour. • The limitations of this approach are similar to those of on-going monitoring in terms of information asymmetry. However, relative to on-going monitoring this approach could reduce the burden on operators and the competition authority.	• Similar types of periodic reviews occur in the context of competition law exemption arrangements in sectors such as airline alliances or liner shipping conferences where there are also concerns about coordination.
New rules on market manipulation	• In addition to the competition law provisions, additional targeted rules could be introduced for the LPG sector which prohibit certain types of actions or behavior which could constitute market manipulation or market abuse in the specific LPG context, or place an obligation on LPG operators to act in good faith in setting prices.	• If the rules are effectively implemented and the sanctions for breaching them are sufficiently large they can act as a deterrent to coordination. As the rules could have different evidentiary standards they may make it easier to prosecute cases of coordination that under generic competition law. This is particularly the case where the burden of proof lies with the LPG operators to show that they have not breached such regulations, or to show that they have acted in good faith. • The major risk is that it is inefficiently implemented and lowers the legal threshold in such a way that it gives rise to false positives (i.e.: behaviour is prosecuted where there has been no coordination).	• Rules of this type have been introduced in wholesale electricity markets in some jurisdictions, such as the EU, UK and Australia, where there are also concerns about coordination among generators.

Price regulation	• Price regulation of LPG could be introduced to ensure that prices reflect underlying costs and that changes in input prices are reflected in final tariffs.	• All, or specific designated, LPG operators could be subject to price regulation in the form of maximum prices, cost-based prices or a standard or default price cap which reflects changes in underlying wholesale prices. • The principal risk of this approach is that the price control is set at either too high or too low a level which can change the incentives of operators. There is also a risk that a retail price control does not adapt quickly enough to changes in wholesale prices.	• As described in table 4, LPG prices are subject to regulation in some countries including Canada, Portugal, South Africa and Spain.

(b) Policies to address concerns about the adverse effects of vertical integration

114. Where there are concerns that vertical integration is harming competition a range of structural and behavioural policies can be used with the aim of promoting or intensifying competition.

115. One policy option is to challenge certain conduct by vertically integrated LPG operators that is considered to be harmful using competition law. For example, if a vertically integrated LPG operator has significant market power (or is dominant) in one activity (e.g.: operation of an input terminal or storage facility) and is not providing access to that indispensable or essential input on reasonable terms this could be challenged as a refusal to supply in some jurisdictions. Similarly, competition law could be used if there is evidence that a vertically integrated operator with significant market power (or a dominant position) engages in a margin squeeze, [24] or imposes other non-price conditions, with aim of affecting competition in a related market.

116. Alternatively *ex ante* policy measures might focus on reducing or eliminating the risk that a vertical integrated operator with market power at one level of the supply chain can adversely affect competition in related markets. Such policies have featured particularly prominently in other vertically integrated industries that supply essential services such as energy, communications and transport sectors.

117. Two broad types of policies have been introduced to address concerns about the adverse effects of vertical integration. A first set of policies keep the vertically integrated operator intact but require that it provide access to key inputs that its rivals need to compete in a related market on fair and reasonable terms. For example, an integrated gas storage operator who is also a retail supplier might be required to provide third-party access to that storage facility.[25]

118. While such third-party access requirements are often imposed on vertically integrated operators that have a monopoly in one activity, it is not invariably the case. For example, integrated private energy operators (irrespective of size) can be required to provide third party access to their electricity and gas networks in some countries. Similarly, integrated owners of gas storage facilities (including LNG storage facilities) can be required to provide third-party access to that facility if they have a position of significant market power in some jurisdictions. Similar rules apply in the EU telecommunications sector where any undertaking assessed as having significant market power are required to provide access to their facilities.

[24] A margin squeeze refers to a situation where an integrated firm raises the prices for an essential input that its rivals need to operate in a related market, while simultaneously reducing its retail prices.
[25] Access requirements might involve negotiated third-party access (where customers would negotiate voluntary commercial access agreements in 'good faith' within a certain commercial framework), or regulated third-party access (where operators are required to publish tariffs and other terms of access).

119. Applying this to the current context suggests that policies directed at opening up access may promote the development of competition if it is established that a key impediment is the difficulty that rivals or entrants have in gaining access to key inputs provided by an integrated operator on reasonable terms – such as import terminal rights or storage capacity. For example, as noted in table 8 above, the Portuguese competition authority has previously found problems with competitors accessing LPG storage facilities which were controlled by the three main market players. To address this it recommended that a policy based on negotiated access to these facilities be introduced.

120. In some settings, third-party access policies have been considered insufficient to change the incentives of the vertically integrated operator and mitigate the risk that the price and non-price terms of access established will not distort competition in related markets. In response various forms of vertical separation policies have been introduced. The overarching purpose of such separation policies is to create greater operational and decision-making independence between the different activities that a vertically integrated operator is involved in and thus reduce the ability and incentive of the vertically related entity to discriminate against its rivals in the competitive activity.

121. In practice, separation can take various forms, including: accounting separation (where different business divisions are required to prepare and submit separate accounts), structural/business separation (where separate divisions are established within the vertically integrated firm, which, to different degrees, are separated from each other), legal separation (where separate legal entities and boards are established but remain under common ownership) and full ownership separation.[26]

122. Various potential benefits have been associated with the separation of different activities in a vertical supply chain. First, it can have a positive effect on the development of competition in related activities by removing the ability and incentive that a vertically integrated operator has to use its market position in one activity to discriminate in favour of its associated business in a competitive activity. As noted above, even if a vertically integrated operator does not actually engage in price and non-price discrimination practices, the *expectation* (or threat) that it may engage in such behaviour can itself act to deter entry, and the development of competition, in related activities. Second, it limits the vertically integrated operators' ability to engage in various anti-competitive practices that disadvantage/discriminate against its customers in related markets. Finally, it may create stronger incentives for new firms to enter the market, who adopt new approaches and techniques (e.g.: new forms of contracting arrangements, with different, and more effective, ways of sharing risks among parties involved at different stages in the production chain).

[26] In the UK, different approaches can be seen across sectors. For example, full ownership separation of certain activities in the electricity and rail industries was mandated at the time of privatization, while business separation was required in the telecommunications sector. Separation in the natural gas industry was gradually undertaken first involving structural separation and then full ownership separation.

123. However, the potential benefits associated with vertical separation, in terms of reduced incentives to discriminate against competitors, need to be balanced against any potential costs associated with the loss of scope efficiencies and increased transactions costs. This last point may be particularly relevant in the context of LPG supply where more than one integrated operator is involved and where mandated separation may be a disproportionate response.[27]

124. I am not in a position to assess the appropriateness of vertical separation policies to address the concerns about vertical integration in the specific context of LPG supply in Chile. Rather the purpose of the discussion is simply to highlight it as a potential policy option and one which has been used in other contexts to address concerns about the adverse effects of vertical integration on the development of competition in related markets.

(c) Policies to address concerns about vertical agreements and restraints

125. Where there are concerns that vertical agreements of restraints are harming competition a range of structural and behavioural policies can be used with the aim of promoting or intensifying competition. One policy option is to use competition law to challenge the specific vertical restraints or aspects of vertical agreements which are seen as restrictive of competition, such as exclusivity agreements or the use of fidelity discounts or loyalty payments.

126. An alternative set of policy measures focus on preventing the adverse effects of vertical restraints arising. Broadly speaking these policy interventions focus on prohibiting certain contractual provisions or other restraints that lock-in downstream customers (e.g.: sub-distributors and end-users) or create other impediments to customers searching and switching to alternative providers (e.g.: reduce the incentives for them to be more active). These measures can target the vertical supply arrangements between upstream LPG operators and sub-distributors of LPG, as well as the supply arrangements between LPG distributors and end-users (e.g.: households or commercial users).

127. Such policies might target the following aspects of the vertical supply LPG arrangements where they exist:

- Prohibit the use of exclusive agreements in contracts between upstream LPG operators who have market power and downstream customers (including sub-distributors and end-users), or the use of non-volume based loyalty discounts or fidelity incentives between upstream LPG operators and sub-distributors.

[27] While vertical separation is typically applied in settings where there is a single dominant integrated firm there are examples of where it has been required in the context of multiple competing integrated firms. For example, in Europe all integrated four-party card payment operators (such as Visa and Mastercard) have been required to separate/ringfence their card processing functions from scheme membership to promote competition in processing.

- Prohibit the use of introductory or low incentive tariffs to encourage downstream customers (sub-distributors or bulk LPG customers) to sign up to an upstream LPG supplier.

- Limit the ability of upstream LPG operators to combine the sale of bulk LPG with other services such as ownership or operation of tanks or ongoing maintenance contracts.

- Limit the length of termination periods in contracts, and also any undue early termination charges or penalties.

- Require that contracts and supply arrangements have a finite length such that customers are periodically required to renew their contract.

- Ensure that contracts are clear and transparent, particularly the key terms of the contract.

- Require that certain sub-distributors (such as those above a certain size) supply multiple brands of cylinder LPG.

128. Table 12 presents an analysis of each of these policy measures including how they might address the rigidities in the current vertical supply arrangements identified by the FNE and intensify downstream customer engagement and switching. As with table 11 above this is a general analysis of the different policy alternatives and does not assess the appropriateness of each measure in the specific context of LPG supply in Chile.

Table 12: Possible interventions into LPG markets to address concerns about vertical supply arrangements

Policy intervention	What might such a policy involve?	How might this measure intensify competition?
Prohibit exclusive supply agreements	• Upstream LPG operators, or those above a certain size, may be prohibited from entering into exclusive supply agreements with downstream customers.	• This measure could intensify inter-brand competition by allowing downstream customers to enter into agreements with alternative upstream LPG suppliers.
Prohibit the use of incentives or other discounts to encourage loyalty	• Upstream LPG operators, or those above a certain size, may be prohibited from offering sub-distributors fidelity incentives or loyalty discounts not related to sales volumes.	• This measure could intensify inter-brand competition by changing the incentives of sub-distributors to consider offers from alternative upstream suppliers.

Prohibit the use of introductory or incentive tariffs	• Upstream LPG operators may be prohibited from offering downstream customers a low introductory price and then lock them into a higher tariff for an extended period	• This measure could reduce the scope for competition to be distorted and customers to be locked into a contract, thus enhancing the ability to switch suppliers.
Limit the tying of other equipment to sales of LPG	• Upstream LPG operators may be prohibited in combining the sale of LPG with other services such as equipment and tanks or maintenance contracts (e.g.: for bulk LPG).	• This measure could reduce the switching costs incurred by LPG customers and place additional pressure on LPG suppliers.
Limit the length of termination periods	• Upstream LPG operators may be restricted in the length of termination period they can require in contracts from downstream customers.	• This freedom to switch provided by this measure could make downstream customers more active in searching the market and switch to alternative LPG suppliers, particularly in response to a change in price or non-price terms of supply (e.g: a price increase)
Prohibit undue early termination charges or penalties	• Upstream LPG operators may be prohibited from introducing charges or other penalties for early termination of contracts where such charges do not reflect reasonably incurred costs.	• This could encourage downstream customers users to be more active and search the market and switch to alternative LPG suppliers.
Remove indefinite (evergreen) contracts	• Upstream LPG operators may be required to put a finite date on each contract or require that they be renewed periodically (e.g.: annually)	• The finite nature of contracts could prompt or force downstream customers to search for alternative offers and LPG providers.
Require that contracts clear and transparent	• Upstream operators could be required to ensure that contracts are not opaque and that downstream customers are aware of the key terms of the contract.	• This policy could reduce the opaqueness of contracts and make it easier for customers to understand what terms they are bound to, and when they can switch supplier etc.
Require that sub-distributors above a certain size stock more than one LPG brand	• Sub-distributors above a certain size could be required to stock and offer to end-users more than brand of cylinder LPG.	• This policy could intensify inter-brand competition by conveniently allowing cylinder LPG customers to choose between alternative LPG brands that are stocked by their preferred sub-distributor.

5.4 Summary

129. The FNE has identified concerns about the state of LPG competition. These include various structural factors which give rise to a risk of coordinated behaviour; high levels of vertical integration in the supply of LPG; and low levels of switching among sub-distributors which is attributed to rigid contractual provisions in the vertical supply agreements and the use of incentives to encourage sub-distributors exclusivity.

130. Given these findings, policy interventions might focus on: mitigating the risks of price coordination among the three main LPG suppliers; ensuring that vertical integration does not reduce the ability of non-integrated rivals to compete on equivalent terms, or deter entry by new operators at different stages of the supply chain; targeting certain aspects of the vertical supply arrangements between the three upstream LPG operators downstream customers including terms that effectively 'lock-in' downstream customers to a particular provider.

131. One way to address the risks of coordination is to rely on *ex post* enforcement of competition law to prosecute suppliers that have been involved in such coordination. An alternative set of policies could seek to address the risks of coordination arising in the first place and might involve: structural measures such as divestment of assets to create a new competitor; on-going monitoring of LPG prices; periodic, or ad hoc, reviews of competition between LPG operators; introducing sector specific market manipulation rules that place additional legal restrictions on the ability of the LPG operators to coordinate their behaviour; or price regulation.

132. To address the concerns that vertical integration is harming competition one option is to challenge certain conduct using competition law provisions. Alternatively, policies could be introduced that keep the vertically integrated operator intact but require that it provide access to key inputs that its rivals need to compete in a related market on fair and reasonable terms. If such policies are considered insufficient to change the incentives of the vertically integrated operator, then various forms of vertical separation policies could be contemplated with the aim of creating greater operational and decision-making independence and thus reducing the ability and incentive of the vertically related upstream LPG operator to discriminate against its rivals in the competitive activity.

133. Finally, to address concerns about the vertical agreements between upstream LPG operators and downstream customers one option is to rely on competition law to challenge aspects of the agreements that are restrictive of competition (e.g.: use of fidelity discounts or loyalty payments). An alternative set of policies measures focus on preventing the adverse effects of vertical restraints arising. Such policies could focus on prohibiting certain contractual provisions or other restraints that lock-in downstream customers (e.g.: sub-distributors and end-users) or create other impediments to customers searching and switching to alternative providers (e.g.: reduce the incentives for them to be more active).

Annex 1: Brief biography of author

Dr Christopher Decker is a Research Fellow specialising in economic regulation and competition law and economics in the University of Oxford. He is the author of two books, including a leading textbook, *Modern Economic Regulation: An Introduction to Theory and Practice* (Cambridge University Press, 2014 – second edition forthcoming in 2022) and *Economics and the Enforcement of European Competition Law* (Edward Elgar, 2009) and numerous academic articles, technical papers and research reports. He is also the editor of New Economic Papers on Regulation.

Dr Decker sits on a number of advisory panels including the UK Competition and Markets Authority academic panel and the UK Better Regulation Executive Network of Experts. He is also a member of the Advisory Services panels for the UK energy regulator (Ofgem) and the Australian Energy Market Commission. He was also previously a member of the panel of experts for the Commission for Energy Regulation (Ireland) and was retained by the Australian Government as a technical advisor to the Australian Standing Council of Energy Expert Panel.

He has advised international organisations such as the World Bank, OECD, European Commission and the European Parliament and policy bodies and regulatory agencies in Australia, Argentina, Hong Kong, Lithuania New Zealand, South Africa and the UK. In the last two years, he has provided advice to the Australian Energy Market Commission, the Commission for Energy Regulation in Ireland, the UK Office of Gas and Electricity Markets (Ofgem), the UK Department of Business, Energy and Industrial Strategy, the UK Civil Aviation Authority, National Infrastructure Commission, Payments Systems Regulator the Competition and Markets Authority and the Irish Communications Regulator. He has provided expert economic evidence in proceedings before the European Court of Justice, General Court of the European Union, the International Centre for Settlement of Investment Disputes, the International Chamber of Commerce, the UK Supreme Court, the Irish High Court.

Dr Decker has extensive experience of policy issues in energy markets. This includes issues which arise in energy wholesale markets (such as issues associated with market power, market monitoring and the interactions between physical and financial capacity markets); issues associated with the regulation of transportation networks, capacity markets and storage markets (including in LNG and gas markets), as well as issues associated with retail competition and consumer protection, including the impacts of the removal of price controls in retail energy markets.

Anexo B

Pronunciamientos de la Corte Suprema, el Tribunal de Defensa de la Libre Competencia y de la Fiscalía Nacional Económica sobre el Mercado del Gas

PRONUNCIAMIENTOS DE LA CORTE SUPREMA, EL TRIBUNAL DE DEFENSA DE LA LIBRE COMPETENCIA Y DE LA FISCALÍA NACIONAL ECONÓMICA SOBRE EL MERCADO DEL GAS

1. A continuación, se describirán brevemente algunos de los principales pronunciamientos sobre el mercado del gas por parte de la Fiscalía Nacional Económica ("FNE" o "Fiscalía"), el Tribunal de Defensa de la Libre Competencia ("TDLC") y la Corte Suprema.

I. Fiscalía Nacional Económica

1. Investigación Rol 2363-17, del 16 de marzo de 2021[28]

2. En primer lugar, la FNE se pronunció respecto a una denuncia sobre comercialización de productos a gas. En particular, se denunció la entrega gratuita o a bajo costo de artefactos a gas a inmobiliarias o constructoras para nuevas viviendas, lo que podría perjudicar o excluir a otros proveedores de soluciones de calefacción y agua caliente con fuentes de energía distintas al gas natural. Asimismo, se denunció la existencia de promociones de diversa índole por parte de las empresas distribuidoras de gas natural en la venta de artefactos de gas al cliente final. Por último, se denunció la firma de acuerdos de colaboración entre estas empresas e instaladores autorizados.

3. Con relación a la primera denuncia, la Fiscalía estableció que se trata de una práctica aplicada por parte de todas las empresas distribuidoras de gas natural ("GN") y de gas licuado de petróleo ("GLP"). Asimismo, estableció que la magnitud de estas entregas es reducida si se compara con las importaciones totales de este tipo de productos, y que la proporción de proyectos inmobiliarios a nivel nacional en que se realiza esto es bastante pequeña. Por estas razones, no se observaron riesgos anticompetitivos en esta práctica.

4. Luego de realizar un análisis acerca de la denuncia de la entrega de artefactos y promociones a clientes finales, la FNE no verificó que las empresas distribuidoras de GN tuviesen una participación de mercado elevada que les confiriera poder de mercado suficiente para ejercer acciones anticompetitivas en él, pues tienen competidores como tiendas por departamento, supermercados, tiendas para el hogar y proveedores directos.

5. Por último, no se identificó un efecto exclusorio a raíz de los acuerdos de colaboración entre los instaladores de gas, ni tampoco se advirtieron condiciones discriminatorias para el ingreso al registro de instaladores.

6. En la Resolución respectiva, se ordenó remitir los antecedentes de la investigación a la División de Estudios de Mercado, en ocasión del presente estudio sobre el mercado del gas.

2. Investigación Rol 2533-19, del 11 de octubre de 2019[29]

[28] FNE División Antimonopolios, Informe de archivo "Denuncia sobre comercialización de productos a gas". Rol Nº2463-17. 16 marzo de 2021. Disponible aquí. Resolución de archivo disponible aquí.
[29] FNE División Antimonopolios, Informe de archivo, "Denuncia en contra de Lipigas por eventual conducta anticompetitiva en la distribución de gas licuado en Talca". Rol Nº2533-19. 9 de octubre de 2019. Disponible aquí. Resolución de archivo disponible aquí.

7. La FNE conoció de una denuncia en contra de Lipigas por una eventual conducta anticompetitiva en la distribución de GLP en Talca, causada por una política de descuentos promocionales a los consumidores que compraran directamente a esta compañía.

8. Para la realización de su análisis, se describieron los principales elementos de la estructura del mercado del GLP. Así, se mencionó que "*en la industria del GLP se observa un importante grado de integración vertical entre los segmentos de importación, almacenamiento, transporte, distribución y comercialización"*. Para la caracterización del mercado relevante, se señaló que el GLP a granel no forma parte del mismo mercado que el GLP envasado, puesto que cuenta con un modelo de comercialización distinto, además de requerir que los clientes cuenten con estanques instalados.

9. Con respecto a la conducta denunciada, se señaló que, en principio, los descuentos promocionales no son per se contrarios a la competencia. En esa línea, también se dijo que estos pueden ser utilizados para el fomento de la competencia intermarca. Respecto a los distribuidores del canal indirecto que podrían ser perjudicados por la conducta denunciada, se estableció que los distribuidores no estarían cautivos de las empresas de GLP envasado. Por tanto, las discrepancias que puedan tener con políticas comerciales de las compañías podrían gatillar la decisión de cambiarse de empresa.

3. Investigación Rol 2483-18, del 1 de octubre de 2019[30]

10. En esta investigación, la Fiscalía conoció de una denuncia por posible abuso de posición dominante por parte de las empresas de distribución y comercialización de GLP en la Región Metropolitana. Este abuso se traduciría mediante el cobro de precios excesivos en la venta de GLP a granel, lo que sería facilitado por la supuesta cautividad en la que se encontrarían los clientes finales.

11. En la misma línea que la investigación antes analizada, se señaló que el GLP de uso residencial, comercializado a granel, no es del mismo mercado que el GLP en formato envasado, pues presentan importantes diferencias.

12. Así, la elección de consumo de GLP a granel o en cilindro está determinada por las preferencias particulares de los consumidores, que irían más allá del factor precio, comprendiendo una serie de factores, como consideraciones de seguridad y continuidad del suministro; mayor autonomía de consumo; comodidad respecto a otras alternativas de combustibles; diferenciación del producto en lo referido al despacho y calidad del servicio; consideraciones estéticas; y facilidades en los medios de pago.

13. Por otra parte, el precio cobrado por el GLP contempla la recuperación de estas inversiones por la instalación de los estanques, impactando en el precio del gas, a diferencia de los cilindros. La logística de distribución de GLP a granel es más costosa que la de cilindros, además que la normativa de la primera es más exigente que la segunda, lo que tiene impacto en los costos operacionales de distribución y almacenamiento. Estas diferencias se reflejan en los precios de los formatos. Por esto, a pesar de tratarse del mismo combustible, ambos precios no son comparables.

[30] FNE División Antimonopolios, Informe de archivo "Denuncia por posible abuso de posición de dominio en el mercado del GLP". Rol Nº2483-18. 1 de octubre de 2019. Disponible aquí. Resolución de archivo disponible aquí.

14. Con respecto a la denuncia interpuesta, la Fiscalía concluyó, luego de un análisis, que en el mercado de empresas distribuidoras de GLP a granel en la Región Metropolitana, las tres principales empresas (Abastible, Gasco y Lipigas) tienen participaciones relevantes, por lo que los rivales podrían disciplinar el intento de ejercicio abusivo de poder de mercado por parte de sus rivales. Asimismo, se sostuvo que el regulador ha establecido normas específicas que reducen los costos de cambio de los clientes, favoreciendo la intensidad competitiva en este mercado. Por esto, los consumidores cuentan con alternativas reales de cambio de proveedor de GLP a granel, por lo que no se configuraría en la especie el ilícito de precios excesivos.

15. Por último, se hizo hincapié en que, de acuerdo a los antecedentes aportados por la CNE, gran parte de los rechazos de solicitudes de cambio de empresa de GLP fueron rechazadas sin especificación del motivo. Esta situación dificultaría el monitoreo de la autoridad para evaluar las causas del rechazo, facultad conferida a la FNE para eliminar barreras de salida y aumentar la intensidad competitiva en el mercado.

d. Investigación Rol 2271-14, del 17 de junio de 2015[31]

16. Con fecha 31 de enero de 2014, esta Fiscalía inició una investigación de oficio referida a las condiciones de competencia en la operación del terminal GNL de Quintero[32]. En particular, se indagó acerca del acceso de terceros a este terminal, para establecer si su forma de funcionamiento podría presentar eventuales efectos exclusorios respecto de potenciales usuarios. Por otra parte, se investigó la eventual existencia de una asimetría de información entre los operadores de los terminales y los terceros que quieren ingresar.

17. De la investigación se concluyó, en primer lugar, que no se observaba una negación del uso del terminal de GNL Quintero a terceros, pues, por una parte, las exigencias de plazos y volúmenes por parte de GNL Chile S.A. tenían justificación, y la decisión de terceros de no ingresar al terminal de GNL Quintero podría explicarse por el riesgo original asociado al negocio, por la otra.

18. En ese sentido, el primer *open season* llevado a cabo por la compañía operadora del terminal -GNL Chile- tuvo características propias de la industria, pero con aspectos inflexibles y poco cumplibles para algunos autores de menor tamaño.

19. No obstante, se concluyó que el segundo *open season* presentó un esfuerzo por establecer un acceso a las capacidades del terminal, bajo condiciones más flexibles, públicas y no discriminatorias para todas las partes.

20. Cabe señalar que, en el informe de archivo de esta investigación de fecha 15 de junio de 2015, se advirtió sobre la necesidad de analizar en forma independiente el mercado secundario de GN.

---

[31] FNE División Antimonopolios, Informe de archivo "Investigación sobre las condiciones de competencia en la operación del terminal GNL Quintero". Rol Nº2271-14. 15 de junio de 2015. Disponible aquí. Resolución de archivo disponible aquí.

[32] En este informe se discutió sobre la doctrina de las instalaciones esenciales, señalando que: *"la aplicación de esta doctrina intenta responder al problema planteado a partir de la negativa de una firma que posee el control de una instalación, de proporcionar a un competidor el acceso a un activo indispensable para competir, o bien, proveerlo en condiciones desfavorables o discriminatorias, de tal manera que se erija como una barrera de entrada insuperable para sus competidores. Su razón de existencia es servir de contrapeso excepcional al principio de la autonomía de la voluntad, en pos de resguardar una adecuada competencia ente los distintos actores que componen un mercado en que la instalación pueda poseer una incidencia capital".*

II. Tribunal de Defensa de la Libre Competencia

1. Causa NC 427-14: Solicitudes de Conadecus en relación con el mercado del gas[33]

21. El 27 de octubre de 2014 Conadecus solicitó al TDLC lo siguiente: (i) Que estableciera si la operación de adquisición de CGE por parte de GNF Chile se ajustaba a las normas de libre competencia, estableciendo medidas de ser necesario; (ii) que se pronunciase sobre las relaciones de propiedad existentes entre las diferentes empresas que operan en el mercado del gas (GN y GLP), fijando las medidas necesarias para disminuir los riesgos que de ellas deriven; (iii) que dictase instrucciones de carácter general para que estas sean consideradas por las empresas involucradas en este mercado a la hora de celebrar actos o contratos; (iv) que solicitase al Ministerio de Energía la fijación de las tarifas de suministro de gas y servicios afines en la Región Metropolitana y Región de O'Higgins. Sin embargo, el día 30 de octubre del mismo año el TDLC negó lugar a la tramitación de dichos temas aduciendo su incompetencia por diversos motivos[34].

22. En contra de esta última resolución, Conadecus interpuso un recurso de reclamación ante la Corte Suprema. En la resolución de fecha 29 de enero de 2016, la Corte declaró competente al TDLC para conocer en sede no contenciosa las peticiones (i) y (ii) antes indicadas.

a. Informe aportado por la FNE

23. En el aporte de antecedentes efectuado por esta Fiscalía[35], se detalló el funcionamiento y estructura de la cadena productiva del GN y del GLP, luego se analizaron las relaciones de propiedad existentes y, por último, se revisó la operación de concentración.

24. Después de analizar los antecedentes del mercado del gas, procedió a evaluar la estructura de propiedad existente hasta el momento.

25. En primer lugar, se consideró que en la industria del GN existía un alto grado de integración vertical. Un potencial efecto adverso sobre la competencia que podría derivarse de ello, sería el eventual cierre en mercado secundario de GNL, instancia generada a partir de la comercialización de este producto por los clientes de GNL a terceros. Sin embargo, este riesgo se vería mitigado en la medida en que se incorporen nuevos participantes en GNLC y que estos participen en condiciones competitivas del mercado secundario.

26. En el mercado del GLP también se evidenció un gran nivel de integración vertical entre los segmentos de importación, distribución y comercialización. Esto podría generar ciertos riesgos, como el cierre del mercado de abastecimiento de GLP a Lipigas, debido a las relaciones de propiedad existentes entre Gasmar, una de las principales importadoras de GNL, y Gasco S.A y Abastible, dos de las mayores distribuidoras del mismo.

27. La estructura societaria del mercado del gas, con vínculos de propiedad y control manifiestos entre empresas competidoras, podría importar un riesgo de coordinación en el mercado, pues se crean incentivos para que las decisiones no sean del todo independientes, para maximizar ganancias conjuntas en distintos segmentos del mercado. Así, se observaban numerosos casos de cruce de directores entre las empresas competidoras en los mercados de GN y GLP.

[33] Expediente de la causa TDLC NC Nº 427-14 disponible aquí.
[34] Resolución TDLC Nº51/2018, de fecha 17 de enero de 2018.
[35] Informe FNE que aporta antecedentes a la causa Rol NC Nº 427-14, disponible aquí.

Siendo más evidentes los observados en, por ejemplo, la mesa directiva de la empresa Metrogas S.A. o el interlocking indirecto en el directorio de Gasmar S.A., que tiene entre sus directores a ejecutivos y directores de Gasco S.A., Abastible S.A. y Empresas Copec S.A. (controladora de Abastible S.A.). En esa línea, las dos asociaciones gremiales presentes en los mercados de GN y GLP debieran tomar medidas para limitar riesgos de coordinación entre los competidores, como intercambios de información comercial sensible.

28. Con respecto a la operación de concentración entre GNF Chile y CGE, la Fiscalía no identificó efectos verticales anticompetitivos. Así, se analizaron dos grandes riesgos: bloqueo de insumo y bloqueo de clientes. En relación al primero, GNF no tiene una posición relevante en el mercado de abastecimiento, ni tampoco se espera que la tenga en el futuro dado el funcionamiento del mercado. Respecto al bloqueo de clientes, tampoco se presenta, pues la participación de Metrogas aguas abajo no es de una magnitud suficiente para debilitar las posibilidades de abastecimiento de otras empresas.

29. Por el contrario, se reconoció un posible beneficio para la industria del gas, en razón de las relaciones existentes entre los distintos actores de la industria. Ello, pues GNF Chile propuso una reorganización, en virtud de la cual de los tres participantes de GLP que antes tenían participación en la propiedad de Metrogas, quedaría sólo uno –Abastible-, reduciendo de esta manera el riesgo de que dicha empresa actuase como una plataforma de intercambio de información entre los actores del mercado de GLP.

30. Si bien se descartaron riesgos horizontales y verticales provenientes de la Operación, se señaló que ésta podría permitir eludir la nueva regulación, en caso de que fuera aprobada por el Congreso en los términos en que se discutía al momento del aporte de antecedentes. Esto, pues el proyecto de ley en tramitación a la fecha -que posteriormente se convirtió en la Ley 20.999- limitaba la rentabilidad de Metrogas utilizando el valor real del gas de la empresa adquirente, lo que podría generar incentivos para que GNF, como potencial proveedor de GNL, aumente artificialmente los costos de Metrogas, cobrando los excedentes que no puede percibir por la regulación citada. De este modo, esta Operación permitiría eventualmente, por ejemplo, mantener las rentabilidades de Metrogas dentro del rango establecido, aumentar los beneficios derivados de la venta de combustible por parte de GNF, y eventualmente, distorsionar el valor del GN en el mercado secundario.

b. Resolución del TDLC

31. Con fecha 17 de enero de 2018, a través de la Resolución N°51/2018[36], el TDLC se pronunció y estableció las medidas pertinentes en virtud de los antecedentes entregados por los diversos entes interesados.

32. Con respecto a la operación de concentración, el Tribunal estableció que, dado que los antecedentes del proceso no permitieron establecer que en la especie se constituyera un ilícito anticompetitivo, no se adoptarían medidas concretas.

33. Posteriormente, el Tribunal realizó un análisis de los eventuales riesgos horizontales, por un lado, y de los efectos verticales, por otro. Para el primero, consideró al GN y al GLP como bienes sustitutos imperfectos que forman parte de un mismo mercado, y desde esta base identificó dos situaciones altamente riesgosas que debían ser subsanadas. Primero, la

[36] Resolución TDLC Nº51/2018, de fecha 17 de enero de 2018.

composición accionaria de Metrogas, la cual está compuesta, entre otras, por Abastible y Copec; y segundo, la participación de Abastible y Gasco en la propiedad de Gasmar.

34. En esa línea, el TDLC consideró que la estructura de propiedad de Metrogas hacía que persistiese el riesgo de que se presentaran situaciones de interlocking indirecto, o bien, que fueran adoptadas decisiones estratégicas que disminuyeran la competencia en el mercado. Por ello, el órgano estimó necesario establecer una serie de medidas "cortafuegos" relacionadas con la integración de los directorios y las relaciones entre los funcionarios de las empresas en cuestión.

35. Por otra parte, el TDLC consideró que el riesgo de coordinación derivado de la participación de Gasco y Abastible en la propiedad de Gasmar era sumamente relevante por una serie de razones, a saber: que el mercado del GLP era altamente concentrado, que la información posible de ser traspasada era sumamente relevante en términos agregados de mercado, que el poder de negociación de los consumidores finales era bastante bajo, entre otras. En virtud de ello se adoptaron medidas estructurales, debiendo ambas compañías enajenar, en el plazo de 18 meses, su propiedad en el terminal Gasmar.

36. A su vez, con respecto a los riesgos verticales, el Tribunal identificó que el riesgo de que se establecieran barreras de entrada al mercado podía darse únicamente en relación a los terminales. En contraste, el acceso a los gasoductos cuenta con una regulación en el Decreto Supremo 263 de 1995[37], el cual incorpora la obligación para los concesionarios de transporte de gas natural de operar bajo un sistema de acceso abierto[38].

37. En la misma línea, señaló que el riesgo de integración vertical se presentaba esencialmente respecto del Terminal GNL Quintero, puesto que entregaba la totalidad de su capacidad a GNL Chile, de modo que los terceros únicamente -y en forma eventual- podía acceder a su uso a través de los open season. En contraste, el Terminal GNL Mejillones que operaba con un régimen de acceso abierto. Con el objeto de mitigar estos riesgos, y de profundizar el mercado secundario, el Tribunal señaló que deberán adoptarse una serie de medidas pro-transparencia, descritas en la resolución.

38. Esta resolución se pronunció con el voto en contra de la Ministra María de la Luz Domper Rodríguez. La opinión disidente tuvo como eje central lo excesivo y desproporcionado que resultaban las medidas estructurales establecidas para Gasmar. A juicio de esta Ministra, los riesgos identificados eran menores, y la adopción de medidas "cortafuego" para los directorios de estas empresas hubiesen sido suficiente para subsanarlos. En esa línea, señaló que estas medidas incluso causarían una serie de "*problemas económicos y nuevos riesgos para la libre competencia*".

c. Resolución de la Corte Suprema

39. Con posterioridad, Conadecus, Gasco, Abastible, Copec y Gasmar, interpusieron en forma individual recursos de reclamación ante la Corte Suprema en contra de esta resolución. El máximo tribunal, en el fallo de la causa rol Nº 4108-2018[39] resolvió y rechazó cada uno de los recursos esgrimidos. Como argumento principal, estableció que nada impedía al TDLC tomar

[37] Decreto N° 263 del 2010 del Ministerio de Economía, Fomento y Turismo.
[38] De acuerdo al artículo 11 del Decreto 263 de 2010, "*Se entenderá por "acceso abierto" el ofrecimiento que las empresas concesionarias de transporte de gas realicen de sus servicios de transporte en igualdad de condiciones económicas, comerciales, técnicas y de información, respecto de su capacidad de transporte disponible".*
[39] Sentencia Corte Suprema, Rol Nº4.108-2018, de fecha 13 de noviembre de 2019.

medidas en sede no contenciosa, puesto que estas se fundaban en posibles compromisos a la competitividad del mercado del gas derivados de la estructura de propiedad existente, y no en ilícitos concretos. En esa línea, subsanar dichos riesgos atendía a un fin superior relacionado con el orden público económico.

2. Causa NC 426-14: Solicitud de la Municipalidad de Maipú en relación a la fijación de tarifas de Metrogas[40]

40. La Municipalidad de Maipú solicitó al TDLC que requiriese al Ministerio de Energía la fijación de precios de las tarifas de suministro de gas y servicios afines a todo consumidor de la zona de concesión de Metrogas. Esta solicitud tuvo como origen un informe de la CNE, que señaló que Metrogas habría obtenido rentabilidades que exceden el umbral máximo establecido por ley y que, por lo tanto, permitirían la fijación tarifaria.

a. Informe aportado por la FNE

41. En el Informe realizado por la Fiscalía con el objeto de aportar antecedentes, se estableció que en la industria del gas natural existía un alto grado de integración vertical en las etapas de importación, transporte, distribución y comercialización. Si bien esta integración vertical podría ser eficiente en el sentido de reducir los costos operacionales asociados al suministro de GN, esta estructura podría causar riesgos para la competencia, pudiéndose generar conductas discriminatorias en distintas etapas de la cadena. De la misma forma, podría causarse una eventual fijación de precios de transferencia entre un eslabón y otro, redundando en una distribución de beneficios entre empresas relacionadas que podría ser artificialmente favorable a alguna de ellas, generando un perjuicio a los consumidores finales.

42. En esa línea, se dijo que la existencia de distintos actores en las etapas de distribución y comercialización no disciplina *per se* la industria, puesto que, el mercado relevante geográfico para cada uno de los actores se determinaría por el alcance de sus propias redes de distribución que no se superponen.

43. Asimismo, se verificó la existencia de vínculos de propiedad y control entre empresas distribuidoras de GLP y comercializadoras de GN, situación que podría eventualmente importar un riesgo a la libre competencia, al existir la posibilidad de que se generen incentivos para la adopción de decisiones comerciales coordinadas, que busquen maximizar ganancias conjuntas en ambos segmentos de mercado.

44. Posteriormente, la Fiscalía sostuvo que el GN y GLP no son fuertemente sustitutos en la práctica, debido a la existencia de costos de cambio entre estas alternativas energéticas y una baja intensidad competitiva derivada de integraciones verticales y horizontales en el mercado. Asimismo, el consumo de los hogares que consumen GN es mucho mayor que el de los que utilizan GLP. Esto puede explicarse por dos razones: (i) Hogares que utilizan GLP utilizan adicionalmente otras fuentes energéticas; y (ii) El consumo de GN está concentrado en los hogares de mayor ingreso. Por estas razones, el gas natural constituiría un mercado relevante en sí mismo.

45. Por último, se indicó al TDLC que, para poder efectuar un análisis adecuado sobre esta materia, resultaba imprescindible contar con antecedentes adicionales respecto a las características propias de la industria, sus segmentos y estructuras de precios. Por esto, la Fiscalía solicitó al

[40] Informe TDLC Nº12 de 2015. Causa Rol NC 426-2014. Disponible aquí.

TDLC que oficiara a todos los actores involucrados en los mercados de GN y GLP detallando la información que debiera ser solicitada.

b. Resolución del TDLC

46. Sin embargo, la resolución del Tribunal se distanció de este análisis, y resolvió considerando los elementos jurídicos y técnicos detrás del análisis de rentabilidad aducido por la Municipalidad de Maipú.

47. Así, considerando que la libertad tarifaria era la regla general, la única forma de establecer un sistema de fijación de precios era concurriendo uno de los presupuestos establecidos en la Ley de Servicios de Gas. En este caso, se solicitaba la fijación tarifaria en virtud de lo establecido en el artículo 31 de la Ley de Servicios de Gas, que facultaba al Ministerio de Energía para fijarlos a solicitud del TDLC, quien tenía la obligación de realizar un doble análisis para efectos de emitirla. En primer lugar, debía realizar un análisis financiero que permitiera chequear la rentabilidad de la empresa concesionaria, y luego de realizado, el Tribunal "*quedaba habilitado para abocarse al conocimiento del asunto relacionado propiamente con la libre competencia*".

48. Sin embargo, a juicio de este órgano, *"el marco jurídico aplicable al chequeo de rentabilidad y la determinación de la tasa de costo anual de capital es insuficiente y adolece de vacíos normativos*." Por ende, la Resolución de la CNE sobre la que se realizaron los chequeos de rentabilidad y que sustenta la pretensión de la solicitante, carecía de la jerarquía normativa exigida legalmente para la aplicación de esta disposición de la Ley de Servicios del Gas.

49. En virtud de lo señalado, el Tribunal resolvió que en todos los casos quedaba excluida la posibilidad de determinar el presupuesto base para solicitar la fijación de tarifas al Ministerio de Energía.

50. Cabe señalar que, con posterioridad a este caso, la Ley 20.999 incorporó una reforma al régimen de rentabilidad máxima de las empresas como una de sus modificaciones más relevantes al sistema regulatorio del mercado del gas.

3. Expediente de Recomendación Normativa 18-13, sobre la transferencia de estanques a granel de GLP[41]

51. La FNE solicitó al TDLC que propusiera al Ministerio de Energía el establecimiento de un sistema de transferencia de los estanques de gas a granel y un sistema de solución de controversias en la materia.

a. Informe de la FNE

52. En el Informe presentado[42], la Fiscalía señaló que existían características anticompetitivas en el mercado de distribución de gas, las que eran incrementadas por el sistema vigente de regulación de transferencia de los estanques a granel. El mecanismo que permitía la libre elección de distribuidores de GLP envasado en cilindros, para fomentar competencia entre oferentes, no era extensible a los estanques. Así, las empresas incumbentes no llenaban estanques de terceros. Por esto, se planteó la recomendación de contar con un mecanismo regulatorio de transferencia de estanques que fomentara la competencia.

[41] Resolución de término TDLC Rol nº18/2013. Causa ERN Nº127-2014. Disponible aquí.
[42] Informe FNE, "Solicita a TDLC que proponga la dictación de preceptos sobre transferencia de estanques de GLP". Causa ERN Nº127-2014. Disponible aquí.

53. Posteriormente, se realizó un análisis de sustituibilidad entre el GLP y el GN. En esa línea, se señaló que, dado que el GN es el sustituto más cercano del GLP, la presión competitiva entre ambos combustibles dependerá, en último término, del grado de cobertura de las redes por las cuales es provisto el GN y, por lo tanto, de las posibilidades de acceso de los consumidores a ese combustible en particular. Sobre este punto, se señaló que en gran parte del país los usuarios de GLP no tenían acceso a gas natural. Asimismo, que existían varios costos de cambio para los clientes de GLP en estanques, como el costo de instalación y desinstalación del estanque, el costo de convertir las redes, y costos de coordinación y tiempo para el usuario.

54. Con respecto a la estructura del mercado, la Fiscalía señaló que la normativa asociada a la distribución de GLP era bastante exigente en materia de seguridad, por lo que las inversiones para los actores para entrar al mercado eran altas. Por otra parte, se dijo que existía una tendencia a la integración vertical de las empresas incumbentes en el mercado del GLP. Junto con otros factores, esto producía un mercado con dificultades para el ingreso y la expansión, lo que se reflejaba en que en los últimos veinte años no hayan ingresado al mercado nuevos actores.

55. A juicio de la Fiscalía, la legislación vigente establecía restricciones en relación al suministro de GLP a granel por parte de terceros no propietarios del estanque, con el fin de asignar razonablemente las responsabilidades en materia de seguridad y generar incentivos para la precaución de accidentes. Sin embargo, se consideró por parte de la FNE que era posible fomentar la competencia en el mercado sin alterar dicho sistema de incentivos ni poner en riesgo la seguridad de la instalación, a través de la implementación de un sistema que redujera los costos de cambio de los clientes.

56. Como una alternativa que permitiera compatibilizar seguridad con competencia, la Fiscalía recomendó la adopción de la una solución similar a la utilizada en el Reino Unido, que había establecido un conjunto de medidas que contemplan un sistema de transferencia de la propiedad de los estanques entre las empresas distribuidoras de gas, en caso de que el cliente optara por cambiar de proveedor. Esto, con la finalidad de aminorar los costos de cambio, permitiendo incrementar la tendencia competitiva de la industria.

57. Cabe señalar que el derecho de los clientes a cambiarse de empresa distribuidora fue incorporado por la Ley 20.999 y Resolución Exenta N°321 de la CNE[43].

b. Resolución del TDLC

58. Sin embargo, el TDLC sostuvo que la FNE asoció a un problema de competencia una serie de hechos que no permiten concluir que su análisis fuese correcto.

59. En primer lugar, en oposición a lo establecido por la solicitante, el Tribunal señaló que no existían antecedentes que permitan concluir, prima facie, que los reclamos de los usuarios se debieran a una deficiente competencia en el mercado.

60. En segundo lugar, a juicio del tribunal, el GN no podía descartarse como un sustituto del GLP a granel en gran parte de los mercados geográficos nacionales, aun cuando esa relación de sustituibilidad no funcionara de manera inversa. Esta situación no ocurría en Reino Unido, por

[43] FNE División Antimonopolios, Informe de archivo “Denuncia por posible abuso de posición de dominio en el mercado del GLP”, Rol Nº2483-18, 1 de octubre de 2019, 5. Disponible aquí. Resolución de archivo disponible aquí.

lo que la situación regulatoria en Chile no es la existente en el país cuyo sistema se aplica como modelo.

61. En tercer lugar, el TDLC sostuvo que un mecanismo obligatorio de transferencia de estanques no eliminaría los costos de cambio identificados por la FNE, principalmente aquellos relacionados con el cumplimiento de las normativas de seguridad. Por contraste, podía introducir otros costos adicionales, como los que deberían desarrollar las empresas para fijar un precio de transferencia.

62. Por las razones mencionadas, el tribunal consideró que no era necesario proponer la regulación de un procedimiento de transferencia obligatoria de la propiedad de los estanques de GLP a granel entre empresas distribuidoras, así como tampoco proponer el establecimiento de una regulación del precio de dichas transferencias. A mayor abundamiento, existirían medidas menos costosas e intrusivas para solucionar los problemas detectados, como las propuestas por Gasco.

III. Corte Suprema

1. Sentencia de la causa Rol Nº 41279-2020, del 7 de agosto de 2020[44]

63. Inversiones GNL Talcahuano SpA dedujo un recurso de protección contra Gasoducto del Pacífico S.A., a raíz a su omisión de extender un certificado de factibilidad técnica oficial, en su calidad de empresa concesionaria del servicio de transporte de gas, para que determinara la actora si era posible ejecutar un proyecto de construcción y operación de un terminal marítimo de GNL en la bahía de Talcahuano. En el recurso, solicitó que la respuesta se declarara ilegal y arbitraria, y que se ordenara un pronunciamiento claro, completo y formal por parte de Gasoducto del Pacífico. Como fundamento, la recurrente señaló que su proyecto dependía y tenía como base técnico-económica la posibilidad de conexión al gasoducto que opera y explota la recurrida.

64. En su análisis, la Corte Suprema señaló una serie de elementos de relevancia. En primer lugar, estableció que la Ley de Servicios de Gas no trata la materia de acceso a las redes de transporte de gas natural de manera expresa. Doctrinariamente, se ha señalado que que esto se debería a que la Ley fue diseñada para regular la producción y distribución de gas manufacturado, que, a diferencia del gas natural, se elabora en centros de producción o fábricas que pueden estar cerca de los lugares de consumo. Por esto, no se regula en profundidad la actividad de transporte de gas por sistemas de transporte o gasoductos, importante para el gas natural, pues se extrae desde yacimientos muchas veces alejados.

65. Por otra parte, que el Certificado de Factibilidad es de carácter vinculante para quien lo extiende. En este caso, su no entrega impide eventualmente la entrada de un actor al mercado, generando barreras a la entrada en el servicio público de distribución de gas.

66. Asimismo, la Corte sostuvo que no procedía *"[…] la alegación de la recurrida de que se encuentra legalmente obligada a proporcionar su capacidad disponible de transporte de gas a todos los interesados a través de un proceso abierto (Open Season), pues tal y como lo especificó la Superintendencia de Electricidad y Combustibles (SEC), dicha autoridad no ha impartido instrucción alguna que defina o regule el sistema de acceso abierto a que se refiere el artículo 14 del Decreto Supremo N° 584 de 1998".* En la práctica, el sistema que

[44] Sentencia Corte Suprema, Rol Nº41.279-2020, de fecha 7 de agosto de 2020.

suelen emplear las empresas concesionarias del servicio de gas natural es el de convocatoria o licitación pública. En esa línea, hizo hincapié en que no hay normativas dictadas por parte de la SEC que reglamenten el sistema de acceso abierto.

67. Por las razones esgrimidas, la Corte resolvió que la recurrida incurrió en una omisión arbitraria, por lo que acoge el recurso de protección.

Anexo C

Ejercicio de robustez y resultados del análisis de la integración horizontal

EJERCICIO DE ROBUSTEZ Y RESULTADOS DEL ANÁLISIS DE LA INTEGRACIÓN HORIZONTAL

I. Resultados del modelo alternativo

$$\log(p_{mt}) = \beta_1 HHI_{mt} + \beta_2 \Delta GHHI_{mt} + \gamma X_{mt} + v_m + dY_t + dQ_t + \varepsilon_{mt}$$

Notemos que este modelo es idéntico al presentado en el cuerpo principal del informe a excepción de v_t el cual correspondía a un efecto fijo por cada período de la muestra. Este efecto es reemplazado por $dY_t + dQ_t$ el cual corresponde a un efecto fijo por año, dY_t, y un efecto fijo por trimestre, dQ_t. Sin perjuicio del cambio anterior, esta especificación sigue considerando efectos fijos por comuna.

Comparacion Resultados: Dep. Var log (Precio GLP)

	Variable Dependiente								
	Lineal (6-12) (1)	Cuadratic (6-12) (2)	Cubic (6-12) (3)	Lineal (6,12) (4)	Cuadratic (6,12) (5)	Cubic (6,12) (6)	Lineal (1,2,3) (7)	Cuadratic (1,2,3) (8)	Cubic (1,2,3) (9)
HHI	-0.074	-0.079	-0.079	-0.077	-0.074	-0.074	-0.030	-0.032	-0.033
	(0.056)	(0.054)	(0.054)	(0.055)	(0.054)	(0.054)	(0.037)	(0.036)	(0.036)
Delta_GHHI	0.008	0.389**	0.907***	0.017	0.185*	0.427**	-0.007	0.161	0.387**
	(0.041)	(0.178)	(0.314)	(0.041)	(0.109)	(0.201)	(0.029)	(0.104)	(0.192)
Delta_GHHI_2		-1.416**	-6.985***		-0.709**	-2.937**		-0.657**	-2.756**
		(0.584)	(2.472)		(0.342)	(1.359)		(0.331)	(1.315)
Delta_GHHI_3			13.557**			4.996*			4.726*
			(5.420)			(2.657)			(2.590)
tmax_C	-0.0001	-0.0001	-0.00004	0.00000	0.00003	0.00003	0.0004	0.0004	0.0004
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
presipit_mm	0.00000	0.00000	0.00000	-0.00000	-0.00000	-0.00000	-0.00002	-0.00002	-0.00002
	(0.00002)	(0.00002)	(0.00002)	(0.00002)	(0.00002)	(0.00002)	(0.00002)	(0.00002)	(0.00002)
I(N_CLIENTES/TOTAL_POBLACION_2017)	-0.155	-0.376**	-0.434**	-0.155	-0.251	-0.303*	-0.043	-0.131	-0.176
	(0.164)	(0.182)	(0.186)	(0.163)	(0.167)	(0.170)	(0.144)	(0.149)	(0.151)
PIB_REGION	0.00000***	0.00000***	0.00000***	0.00000***	0.00000***	0.00000***	0.00000***	0.00000***	0.00000***
	(0.00000)	(0.00000)	(0.00000)	(0.00000)	(0.00000)	(0.00000)	(0.00000)	(0.00000)	(0.00000)
log(P_KG_ADQ)	0.408***	0.417***	0.417***	0.448***	0.456***	0.457***	0.454***	0.453***	0.453***
	(0.028)	(0.027)	(0.027)	(0.040)	(0.040)	(0.040)	(0.014)	(0.014)	(0.014)
log(P_M3_ADQ)	-0.011	-0.014	-0.016	-0.013	-0.015	-0.015	-0.020***	-0.021***	-0.021***
	(0.009)	(0.010)	(0.010)	(0.009)	(0.009)	(0.009)	(0.007)	(0.007)	(0.007)
log(DIST_W_w)	-0.004*	-0.005**	-0.004**	-0.004*	-0.004**	-0.004**	-0.003	-0.003	-0.003
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
QUARTER_2	-0.024***	-0.023***	-0.023***	-0.020***	-0.019***	-0.019***	-0.059***	-0.058***	-0.058***
	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)	(0.007)	(0.010)	(0.010)	(0.010)
QUARTER_3	0.001	0.002	0.002	0.001	0.002	0.002	-0.060***	-0.060***	-0.060***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.010)	(0.010)	(0.010)
QUARTER_4	0.029***	0.029***	0.029***	0.027***	0.027***	0.027***	-0.018*	-0.018*	-0.018*
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.010)	(0.010)	(0.010)
YEAR_2013							-0.060***	-0.059***	-0.058***
							(0.011)	(0.011)	(0.011)
YEAR_2014	0.030***	0.032***	0.033***	0.026***	0.026***	0.027***	-0.032***	-0.030**	-0.029**
	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)	(0.012)	(0.012)	(0.013)
YEAR_2015	-0.082***	-0.080***	-0.079***	-0.064***	-0.060***	-0.060***	-0.117***	-0.117***	-0.116***
	(0.014)	(0.014)	(0.014)	(0.019)	(0.018)	(0.018)	(0.015)	(0.015)	(0.015)
YEAR_2016	-0.061***	-0.056***	-0.057***	-0.039	-0.032	-0.031	-0.090***	-0.088***	-0.088***
	(0.018)	(0.018)	(0.018)	(0.025)	(0.025)	(0.025)	(0.018)	(0.017)	(0.017)
YEAR_2017	-0.038***	-0.035**	-0.037***	-0.020	-0.017	-0.017	-0.071***	-0.072***	-0.072***
	(0.014)	(0.014)	(0.014)	(0.019)	(0.019)	(0.019)	(0.015)	(0.015)	(0.015)
YEAR_2018	-0.019	-0.014	-0.014	-0.003	0.002	0.002	-0.052***	-0.051***	-0.051***
	(0.014)	(0.014)	(0.014)	(0.018)	(0.018)	(0.018)	(0.016)	(0.016)	(0.016)
YEAR_2019	0.016	0.023	0.024	0.038*	0.043*	0.045**	-0.009	-0.008	-0.007
	(0.017)	(0.017)	(0.017)	(0.023)	(0.023)	(0.023)	(0.017)	(0.017)	(0.017)
YEAR_2020	0.023	0.033	0.035*	0.049*	0.056**	0.058**	0.004	0.006	0.007
	(0.021)	(0.021)	(0.021)	(0.028)	(0.028)	(0.028)	(0.017)	(0.017)	(0.017)

QUARTER_2:YEAR_2013							0.044***	0.044***	0.043***
							(0.011)	(0.011)	(0.011)
QUARTER_3:YEAR_2013							0.065***	0.065***	0.065***
							(0.011)	(0.011)	(0.011)
QUARTER_4:YEAR_2013							0.046***	0.047***	0.047***
							(0.012)	(0.012)	(0.012)
QUARTER_2:YEAR_2014	0.003	0.003	0.003	0.004	0.004	0.004	0.046***	0.046***	0.046***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.011)	(0.011)	(0.011)
QUARTER_3:YEAR_2014	-0.048***	-0.047***	-0.047***	-0.042***	-0.041***	-0.041***	0.024**	0.024**	0.024**
	(0.009)	(0.009)	(0.009)	(0.010)	(0.010)	(0.010)	(0.011)	(0.011)	(0.011)
QUARTER_4:YEAR_2014	-0.137***	-0.135***	-0.135***	-0.123***	-0.120***	-0.120***	-0.077***	-0.077***	-0.077***
	(0.014)	(0.014)	(0.014)	(0.018)	(0.018)	(0.018)	(0.013)	(0.013)	(0.013)
QUARTER_2:YEAR_2015	0.024***	0.024***	0.023***	0.023***	0.023***	0.022***	0.066***	0.066***	0.066***
	(0.008)	(0.008)	(0.009)	(0.008)	(0.008)	(0.008)	(0.013)	(0.013)	(0.013)
QUARTER_3:YEAR_2015	0.020*	0.022**	0.021*	0.026**	0.027**	0.027**	0.095***	0.096***	0.096***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.013)	(0.013)	(0.013)
QUARTER_4:YEAR_2015	-0.005	-0.004	-0.005	-0.0002	0.001	0.001	0.048***	0.048***	0.048***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)	(0.012)	(0.012)
QUARTER_2:YEAR_2016	0.025***	0.023***	0.024***	0.021**	0.019**	0.019**	0.064***	0.064***	0.064***
	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)	(0.011)	(0.011)	(0.011)
QUARTER_3:YEAR_2016	-0.025***	-0.024***	-0.024***	-0.024***	-0.024***	-0.024***	0.042***	0.042***	0.042***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.011)	(0.011)	(0.011)
QUARTER_4:YEAR_2016	-0.045***	-0.045***	-0.045***	-0.045***	-0.045***	-0.045***	0.0001	0.001	0.001
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.013)	(0.013)	(0.013)
QUARTER_2:YEAR_2017	0.030***	0.030***	0.030***	0.030***	0.030***	0.030***	0.074***	0.074***	0.073***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.011)	(0.011)	(0.011)
QUARTER_3:YEAR_2017	0.002	0.003	0.003	0.004	0.005	0.005	0.069***	0.069***	0.069***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.011)	(0.011)	(0.011)
QUARTER_4:YEAR_2017	-0.008	-0.010	-0.010	-0.011	-0.012	-0.012	0.035***	0.035***	0.035***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.012)	(0.012)	(0.012)
QUARTER_2:YEAR_2018	0.023***	0.022***	0.022***	0.018**	0.018**	0.018**	0.060***	0.060***	0.060***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.012)	(0.012)	(0.012)
QUARTER_3:YEAR_2018	-0.004	-0.005	-0.005	-0.010	-0.010	-0.010	0.055***	0.056***	0.056***
	(0.009)	(0.009)	(0.009)	(0.010)	(0.010)	(0.010)	(0.012)	(0.012)	(0.012)
QUARTER_4:YEAR_2018	0.0001	-0.0003	-0.0001	0.0002	0.0001	0.0001	0.047***	0.047***	0.048***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.012)	(0.012)	(0.012)
QUARTER_2:YEAR_2019	-0.008	-0.008	-0.008	-0.010	-0.010	-0.010	0.034***	0.034***	0.034***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.013)	(0.013)	(0.013)
QUARTER_3:YEAR_2019	-0.033***	-0.031***	-0.031***	-0.025**	-0.023**	-0.023**	0.041***	0.041***	0.041***
	(0.009)	(0.009)	(0.009)	(0.010)	(0.010)	(0.010)	(0.013)	(0.013)	(0.013)
QUARTER_4:YEAR_2019	-0.054***	-0.054***	-0.054***	-0.051***	-0.051***	-0.051***	-0.005	-0.005	-0.004
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.014)	(0.014)	(0.014)
QUARTER_2:YEAR_2020	-0.007	-0.009	-0.010	-0.011	-0.012	-0.013	0.028**	0.028**	0.027**
	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)	(0.012)	(0.011)	(0.011)	(0.011)
QUARTER_3:YEAR_2020	-0.043***	-0.044***	-0.045***	-0.046***	-0.047***	-0.047***	0.018**	0.018***	0.018***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.007)	(0.007)	(0.007)
QUARTER_4:YEAR_2020	-0.042***	-0.044***	-0.044***	-0.043***	-0.044***	-0.045***			
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)			
Observations	5,823	5,823	5,823	5,858	5,858	5,858	6,462	6,462	6,462
R^2	0.833	0.833	0.833	0.833	0.834	0.834	0.844	0.844	0.845
Adjusted R^2	0.830	0.830	0.830	0.830	0.831	0.831	0.841	0.842	0.842
F Statistic	27,666.210***	27,687.100***	27,709.550***	27,877.850***	28,003.120***	28,043.420***	33,038.220***	33,166.110***	33,213.750***
Note:									*p<0.1; **p<0.05; ***p<0.01

Podemos ver que los parámetros relevantes mantienen su significancia antes esta nueva especificación. Notemos también que el parámetro asociado al costo de adquisición del GLP se encuentra entre 0.408 y 0.457, lo cual se puede interpretar como una elasticidad precio-costo unitario.

Ahora repetimos este ejercicio para el caso del gas natural. Nuevamente, los parámetros relevantes del modelo se mantienen. Cabe señalar que, en este caso, no cambia el signo del costo de adquisición, debido a que, al ser por lo general una única empresa la distribuidora de GN, el precio promedio no se ve afectada por los *share* de mercado.

Comparacion Resultados: Dep. Var log (Precio GN)

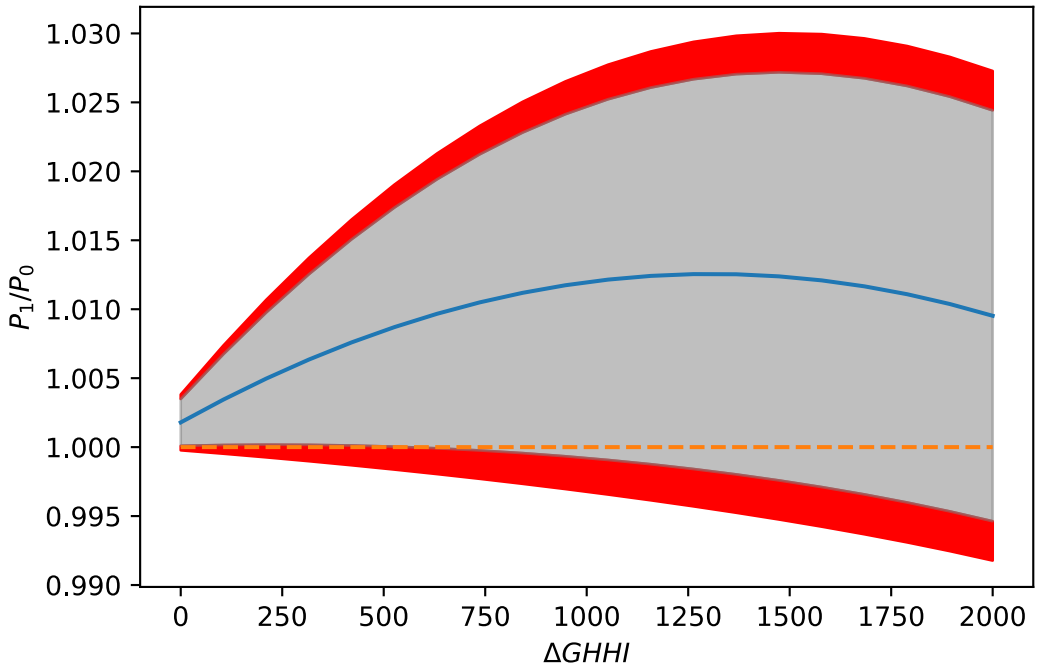
	Variable Dependiente								
	Lineal (6-12)	Cuadratic (6-12)	Cubic (6-12)	Lineal (6,12)	Cuadratic (6,12)	Cubic (6,12)	Lineal (1,2,3)	Cuadratic (1,2,3)	Cubic (1,2,3)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
HHI	-0.415***	-0.415***	-0.418***	-0.406***	-0.407***	-0.407***	-0.327***	-0.328***	-0.328***
	(0.124)	(0.124)	(0.124)	(0.123)	(0.123)	(0.123)	(0.085)	(0.086)	(0.086)
Delta_GHHI	0.045	0.202	-0.156	0.030	-0.043	-0.192	-0.035	0.047	0.079
	(0.064)	(0.240)	(0.317)	(0.064)	(0.147)	(0.317)	(0.055)	(0.148)	(0.327)
Delta_GHHI_2		-0.645	1.145		-0.085	1.289		-0.337	-0.631
		(0.735)	(2.206)		(0.414)	(2.208)		(0.416)	(2.316)
Delta_GHHI_3			-2.796			-3.082			0.662
			(4.410)			(4.420)			(4.659)
tmax_C	0.007***	0.007***	0.007***	0.007***	0.007***	0.007***	0.007***	0.007***	0.007***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
presipit_mm	-0.0003***	-0.0003***	-0.0002***	-0.0003***	-0.0003***	-0.0003***	-0.0003***	-0.0003***	-0.0003***
	(0.00004)	(0.00004)	(0.00004)	(0.00004)	(0.00004)	(0.00004)	(0.00005)	(0.00005)	(0.00005)
I(N_CLIENTES/TOTAL_POBLACION_2017)	-1.118***	-1.207***	-1.030***	-1.137***	-1.073***	-1.041***	-1.167***	-1.208***	-1.215***
	(0.343)	(0.353)	(0.336)	(0.340)	(0.333)	(0.332)	(0.334)	(0.333)	(0.335)
PIB_REGION	0.00000***	0.00000***	0.00000***	0.00000***	0.00000***	0.00000***	0.00000	0.00000	0.00000
	(0.00000)	(0.00000)	(0.00000)	(0.00000)	(0.00000)	(0.00000)	(0.00000)	(0.00000)	(0.00000)
log(P_KG_ADQ)	-0.296***	-0.280***	-0.332***	0.062	0.059	0.059	-0.048*	-0.045*	-0.045*
	(0.047)	(0.047)	(0.049)	(0.059)	(0.059)	(0.059)	(0.027)	(0.027)	(0.027)
log(P_M3_ADQ)	0.108***	0.107***	0.110***	0.105***	0.106***	0.106***	0.088***	0.087***	0.087***
	(0.019)	(0.019)	(0.019)	(0.019)	(0.020)	(0.020)	(0.017)	(0.017)	(0.017)
log(DIST_W_w)	0.002	0.002	0.002	0.002	0.002	0.002	-0.0005	-0.001	-0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
QUARTER_2	-0.058***	-0.056***	-0.061***	-0.024*	-0.024*	-0.024*	0.011	0.011	0.011
	(0.012)	(0.012)	(0.012)	(0.013)	(0.013)	(0.013)	(0.019)	(0.019)	(0.019)
QUARTER_3	-0.045***	-0.045***	-0.044***	-0.046***	-0.045***	-0.045***	-0.050***	-0.050***	-0.050***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.016)	(0.016)	(0.016)
QUARTER_4	-0.056***	-0.057***	-0.054***	-0.078***	-0.078***	-0.078***	-0.031**	-0.031**	-0.031**
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.014)	(0.014)	(0.014)
YEAR_2013							0.009	0.009	0.009
							(0.018)	(0.018)	(0.019)
YEAR_2014	0.012	0.011	0.015	-0.031*	-0.032*	-0.032*	-0.001	-0.0005	-0.0003
	(0.018)	(0.018)	(0.018)	(0.019)	(0.019)	(0.019)	(0.022)	(0.022)	(0.022)
YEAR_2015	-0.252***	-0.244***	-0.259***	-0.081**	-0.073**	-0.073**	-0.110***	-0.108***	-0.108***
	(0.030)	(0.029)	(0.031)	(0.034)	(0.034)	(0.034)	(0.025)	(0.026)	(0.026)
YEAR_2016	-0.266***	-0.254***	-0.278***	-0.037	-0.028	-0.029	-0.080***	-0.077**	-0.077**
	(0.034)	(0.033)	(0.035)	(0.041)	(0.041)	(0.041)	(0.031)	(0.031)	(0.031)
YEAR_2017	-0.234***	-0.227***	-0.247***	-0.074**	-0.073**	-0.073**	-0.097***	-0.096***	-0.096***
	(0.030)	(0.029)	(0.030)	(0.034)	(0.034)	(0.034)	(0.027)	(0.026)	(0.026)
YEAR_2018	-0.210***	-0.202***	-0.223***	-0.061*	-0.060*	-0.060*	-0.068**	-0.066**	-0.066**
	(0.030)	(0.030)	(0.031)	(0.034)	(0.034)	(0.034)	(0.027)	(0.027)	(0.027)
YEAR_2019	-0.086**	-0.076**	-0.104***	0.109**	0.110**	0.109**	0.098***	0.101***	0.101***
	(0.038)	(0.038)	(0.038)	(0.043)	(0.043)	(0.043)	(0.031)	(0.031)	(0.031)
YEAR_2020	-0.153***	-0.140***	-0.175***	0.077	0.077	0.076	0.064**	0.068**	0.068**
	(0.042)	(0.042)	(0.043)	(0.048)	(0.048)	(0.048)	(0.031)	(0.031)	(0.032)

QUARTER_2:YEAR_2013							-0.044**	-0.044**	-0.044**
							(0.020)	(0.020)	(0.020)
QUARTER_3:YEAR_2013							0.003	0.003	0.003
							(0.019)	(0.019)	(0.019)
QUARTER_4:YEAR_2013							-0.037*	-0.037*	-0.037*
							(0.022)	(0.022)	(0.022)
QUARTER_2:YEAR_2014	0.043***	0.043***	0.042***	0.054***	0.054***	0.054***	0.003	0.003	0.003
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.021)	(0.021)	(0.021)
QUARTER_3:YEAR_2014	-0.021	-0.019	-0.027	0.033	0.033	0.032	0.023	0.024	0.024
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.020)	(0.020)	(0.020)
QUARTER_4:YEAR_2014	-0.064**	-0.058**	-0.077***	0.075**	0.075**	0.075**	-0.009	-0.008	-0.008
	(0.029)	(0.028)	(0.029)	(0.032)	(0.032)	(0.032)	(0.022)	(0.022)	(0.022)
QUARTER_2:YEAR_2015	-0.020	-0.021	-0.019	-0.032**	-0.032**	-0.032**	-0.074***	-0.074***	-0.074***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.013)	(0.013)	(0.021)	(0.021)	(0.021)
QUARTER_3:YEAR_2015	-0.047***	-0.044**	-0.052***	-0.003	-0.004	-0.004	-0.003	-0.002	-0.002
	(0.018)	(0.018)	(0.018)	(0.019)	(0.018)	(0.018)	(0.020)	(0.020)	(0.020)
QUARTER_4:YEAR_2015	0.013	0.016	0.010	0.057***	0.058***	0.058***	0.012	0.012	0.012
	(0.021)	(0.021)	(0.020)	(0.022)	(0.021)	(0.021)	(0.018)	(0.018)	(0.018)
QUARTER_2:YEAR_2016	0.048***	0.045***	0.051***	-0.004	-0.005	-0.005	-0.055**	-0.056**	-0.056**
	(0.014)	(0.014)	(0.014)	(0.015)	(0.015)	(0.015)	(0.022)	(0.022)	(0.022)
QUARTER_3:YEAR_2016	-0.061***	-0.061***	-0.062***	-0.059***	-0.060***	-0.060***	-0.074***	-0.075***	-0.075***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.021)	(0.021)	(0.021)
QUARTER_4:YEAR_2016	-0.011	-0.011	-0.012	-0.011	-0.011	-0.011	-0.058***	-0.057***	-0.057***
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.021)	(0.021)	(0.021)
QUARTER_2:YEAR_2017	0.039**	0.038**	0.039**	0.034**	0.034**	0.034**	-0.005	-0.005	-0.005
	(0.015)	(0.015)	(0.015)	(0.016)	(0.016)	(0.016)	(0.023)	(0.023)	(0.023)
QUARTER_3:YEAR_2017	0.004	0.005	0.002	0.023	0.023	0.023	0.027	0.027	0.027
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.020)	(0.020)	(0.020)
QUARTER_4:YEAR_2017	0.056***	0.054***	0.058***	0.032	0.032	0.033	0.004	0.004	0.004
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.018)	(0.018)	(0.018)
QUARTER_2:YEAR_2018	0.072***	0.070***	0.075***	0.037***	0.037***	0.037***	-0.010	-0.010	-0.010
	(0.013)	(0.013)	(0.013)	(0.014)	(0.014)	(0.014)	(0.021)	(0.021)	(0.021)
QUARTER_3:YEAR_2018	0.081***	0.079***	0.086***	0.031	0.031	0.031	0.043**	0.043**	0.043**
	(0.018)	(0.018)	(0.018)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
QUARTER_4:YEAR_2018	0.152***	0.152***	0.152***	0.156***	0.156***	0.156***	0.115***	0.115***	0.115***
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.020)	(0.020)	(0.020)
QUARTER_2:YEAR_2019	-0.028*	-0.028*	-0.027*	-0.042***	-0.042***	-0.042***	-0.083***	-0.083***	-0.083***
	(0.015)	(0.015)	(0.015)	(0.016)	(0.016)	(0.016)	(0.022)	(0.022)	(0.022)
QUARTER_3:YEAR_2019	-0.136***	-0.133***	-0.144***	-0.062***	-0.063***	-0.063***	-0.083***	-0.083***	-0.083***
	(0.020)	(0.020)	(0.021)	(0.020)	(0.019)	(0.019)	(0.023)	(0.023)	(0.023)
QUARTER_4:YEAR_2019	-0.060***	-0.059***	-0.064***	-0.023	-0.023	-0.023	-0.074***	-0.074***	-0.074***
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.023)	(0.023)	(0.023)
QUARTER_2:YEAR_2020	0.109***	0.108***	0.113***	0.084***	0.085***	0.085***	0.034	0.033	0.033
	(0.019)	(0.019)	(0.019)	(0.020)	(0.020)	(0.020)	(0.024)	(0.024)	(0.024)
QUARTER_3:YEAR_2020	0.026	0.025	0.029	-0.001	-0.001	-0.001	0.007	0.007	0.007
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.014)	(0.014)	(0.014)
QUARTER_4:YEAR_2020	0.057***	0.056**	0.059***	0.047**	0.047**	0.047**			
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)			
Observations	5,823	5,823	5,823	5,858	5,858	5,858	6,462	6,462	6,462
R^2	0.578	0.579	0.576	0.573	0.574	0.574	0.520	0.520	0.520
Adjusted R^2	0.570	0.571	0.568	0.565	0.566	0.566	0.511	0.511	0.511
F Statistic	7,996.426***	8,018.219***	7,969.588***	7,824.531***	7,848.438***	7,851.296***	6,894.741***	6,895.821***	6,894.820***
Note:									*p<0.1; **p<0.05; ***p<0.01

II. Resultado modelo cuadrático

A continuación, veremos el efecto y su significancia en el precio del modelo cuadrático, i.e.

$$\log(p_{mt}) = \beta_1 HHI_{mt} + \beta_2 \Delta GHHI_{mt} + \beta_3 (\Delta GHHI_{mt})^2 + \gamma X_{mt} + v_m + v_t + \varepsilon_{mt}$$



Como podemos ver, el intervalo de confianza para el ratio estimado p_1/p_0 incluye siempre al valor 1. En consecuencia, no se puede afirmar que el efecto sea estadísticamente mayor a 1.