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Chaos at the Gates: The impacts of the COVID-19 pandemic and energy price shocks on South Korea's gas industry amid energy transition

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ABSTRACT

South Korea was one of the first countries to be hit by the coronavirus infections. Having rapidly contained the health emergency in the immediate period, Seoul arguably mitigated the economic fallouts more successfully than the majority of advanced economies but could not avoid substantial losses. The far-reaching fallout of COVID-19 has been testing the country's energy transition pathway, as actors involved are facing difficult decisions amid more stringent financial constraints to deliver their ambitious targets, including achieving carbon neutrality by 2050. Amid the combined effects of the pandemic and the global energy prices shocks, addressing the nexus between energy security on the supply side, affordability, and the safety of people's lives and property, has become even more pressing. Against this backdrop, natural gas has tailored a special role to bridge the low carbon re-alignment of the entire Korean energy system, also in the face of the current and future challenges to Korea's energy security. But long-drawn hurdles stemming from rather unsuccessful efforts to reform the gas system risk weakening its ability to cope with present uncertainties and heightened volatilities.

1. INTRODUCTION

The Republic of Korea (hereafter South Korea) was one of the first countries to be hit by COVID-19, reporting its first imported case of coronavirus from Wuhan (China) on 20 January 2020. After an immediate spike in cases, authorities rapidly managed to contain the health emergency through a strategy of intensive testing, tracking and treatment ('3Ts'). By adjusting its movement restrictions in line with case numbers to maintain the essential activities, Seoul arguably mitigated the economic fallouts as well. In contrast to the large pandemic-induced contractions suffered by the majority of advanced economies, largely due to the lockdowns imposed for months, the plunge in private consumption was somewhat offset by the rapidly rebounding net exports and equipment investment, allowing Seoul to see a bounce in the third quarter of 2020. While Korea contained losses to 1 per cent GDP decline, substantial economic damage has been suffered especially by small business and informal employment and the loss of 218,000 jobs for the year 2020 has been the most significant since the 1997–1998 Asian Financial Crisis (AFC). In response to worsening deep-rooted societal

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inequality, the Moon Jae-in's administration launched the first supplementary budget, as early as March, followed by three additional rounds, amounting in total to $58.55 billion or 3.3 per cent of the country's GDP, with a fourth under negotiation at the time of writing.[1] The focus of government intervention has not been limited to helping households stay afloat and enhancing economic resilience but also to anticipating the post-pandemic era with the overall aim of boosting the competitiveness of the economy. In July 2020, President Moon unveiled a blueprint for the country's resurgence towards 2025 based on the pillars of the 'Digital New Deal', the 'Green New Deal' and 'Stronger Safety Nets'. The mega-stimulus package, worth $94.6 billion of fiscal investments, is understood to contribute to the country's commitment to carbon neutrality by 2050.[2] Indeed, the 'Green New Deal' reinforces the efforts of the incumbent administration to transform the energy system through addressing the complexities of transitioning to a low-carbon economy and a new climate regime. In recent years, fine dust concentration and air pollution have prompted political authorities to adopt emergency measures and officially acknowledge the issue as a 'social disaster'.[3] Amid deteriorating air quality, which is aggravated by the trans-boundary pollutants that add up to those from domestic sources, environmental issues have indeed acquired a pronounced political and social salience in South Korea. At the same time, since the arrival of the pandemic, authorities have been confronted with the opposing pressure from the industry to adopt policies and interventions for the sake of immediate recovery that, however, could hinder the enforcement of environmental restrictions.[4]

This article aims to examine how South Korea's primary energy regulators have intended to foster a low-carbon transition of the energy system with a focus on the enhanced role acknowledged to natural gas, which is expected to compensate for the parallel phase out of coal and nuclear power amid efforts to expand the share of renewables. Against this backdrop, the focus of this article will be on the major changes that South Korea's gas sector has undergone in the last few decades. It will be argued that natural gas has tailored a special role to be able to bridge the current realignment around renewable energy, while enhancing the readiness of the entire energy system, also responding to energy and market shocks to the advantage of the country's energy security. At the same time, the resilience of South Korea's turn to gas will be put under increasing pressure by the cyclical events affecting the supply/demand balance amid a more volatile and unpredictable energy world. After this brief overview of South Korea's response to the coronavirus outbreak, the following section (Section 2) gives an account of its energy policies and the challenges relating to the coal-and-nuclear simultaneous phase out and the development of new and renewable energy technologies. In light of the central role of LNG in the energy transition strategy, the next two sections (3 and 4) examine the evolving role of natural gas with particular attention to the governance reform efforts. These are followed by an assessment of the ways in which this sector has coped with uncertainties relating to the impact of the COVID-19 crisis on the global gas market and managed the risks stemming from seasonal price fluctuations (Section 5), and the conclusions (Section 6).

2. SOUTH KOREA'S DECARBONIZATION PATHWAY

Energy and GHG emissions

South Korea relies on only trace amounts of fossil fuel deposits and almost all energy resources need to be imported from overseas. Besides, the country cannot connect to the rest of the Eurasian landmass. Therefore,

1 Ministry of Economy and Finance of the Republic of Korea, 'Press Releases' Budget Office, <https://english.moef.go.kr/pc/selectTbPressCenterList.do?boardCd=N0001&division=006> accessed 1 March 2021.

2 Hankyoreh, 'Moon declares plans to achieve carbon neutrality by 2050 in policy speech' (Seoul, 29 October 2020) <http://english.hani.co.kr/arti/english_edition/e_national/967803.html> accessed 5 January 2021.

3 Korea Herald, 'Parliament passes bill on designating fine dust as social disaster' (Seoul, 13 March 2019) <http://www.koreaherald.com/view.php?ud=20190313000434> accessed 15 October 2019.

4 On March 26, Korea Development Bank and Korea Export-Import Bank issued a 1 trillion won emergency loan to Doosan Heavy Industries & Construction Co. The rescue plan was listed as part of the government's stimulus package for businesses impacted by the COVID-19 pandemic. However, the decision was met with harsh criticism by environmental groups given the lack of environmental conditions being attached to the bail out for a future transition of the company towards renewable energy technologies.

securing a stable supply of energy has been the most important policy priority to maintain rapid economic growth above any other concerns. If the issue of energy stability is essential for such an energy-intensive country, the challenges in terms of sustainability have no less relevance. In fact, the bulwark of the Korean economic structure is still made of energy-intensive and export-oriented industries, albeit a significant expansion of the service sector. This makes it hard for the government to lower energy demand and consumption, however, the 3rd Energy Master Plan (EMP 2019–2040) plans to decrease the amount of energy consumed by 18.6 per cent.[5] As of 2017, the energy-related emissions were 87 per cent of total GHG emissions.[6] Therefore, the goal of reducing energy consumption is strictly related to the emissions reduction target. Unlike many developed countries that in the early 2000s registered slower rates of emissions growth, in South Korea they ramped up by 71.6 per cent on a per capita basis until 2005, and carbon intensity has remained steady since 2014. The fact that South Korea is the fifth largest GHG emitter in the OECD should be considered within the context of a fuel mix in which, in 2018, fossil fuels accounted for 85 per cent of the primary energy supply (TPES).[7] In addition, government-controlled low prices of electricity, which have been aimed to support the energy-intensive manufacturing ecosystem, have contributed heavily to mounting household and industrial consumption, much higher than the OECD average. In 2019, the national GHG reduction target to reduce 37 per cent from the 2030 BAU levels was replaced with an absolute target to bring down 24.4 per cent from 2017 by 2030, and was legislated through the amendment to the Enforcement Decree of the Framework Act on Low Carbon, Green Growth.[8] To implement the updated nationally determined contributions (NDCs) under the Paris Agreement, Seoul is set to follow three main strategies: transitioning to a low-carbon society; establishing a robust adaptation system; and enhancing the climate action framework together with sectoral mitigation measures.[9] Given that 45 per cent of the country's total electricity and heat generation relies on coal, these two sectors contribute slightly over half of the nation's emissions. As of 2019, the top four energy-intensive industries were responsible for 74.8 per cent of the total sectoral emissions. In light of this, scaling down GHG footprint while preserving national economic growth is an arduous undertaking that requires a remarkable reduction in fossil fuel combustion from the industrial, transportation and residential sectors, which are the most energy consuming sectors. Despite the estimated positive returns for energy security, employment and lower GHG emissions, introducing low-carbon energy technologies has already proved to be trickier than expected as for instance the petrochemical industry, which is responsible for most of the non-energy use of oil and coal processed and then re-exported, has stressed various impediments including insufficient financial support, expected economic loss during technology replacement and long payback period as well as technology uncertainty and less pressure on energy prices.[10]

Energy transition policy

In 2019, as the world's 9th largest energy consumer country (2 per cent of total energy consumed worldwide), South Korea registered a decrease in energy consumption that contributed to a drop in CO_2 emissions by more than 3 per cent.[11] The trend was accelerated amid the first-ever catching up to coal and its overtaking in terms of electricity generation by gas and renewables in 2018 and 2019, respectively. Following the first

5 Ministry of Trade, Industry and Energy of the Republic of Korea, 'Third Energy Master Plan (2019–2040): A New Energy Paradigm for the Future' (2019) <https://www.etrans.or.kr/ebook/05/files/assets/common/downloads/Third%20Energy%20Master%20Plan.pdf>.

6 International Energy Agency, 'Korea 2020: Energy Policy Review' (2020) <https://www.iea.org/reports/korea-2020>.

7 Ibid.

8 Ministry of Environment of the Republic of Korea, '2nd Basic Plan for Climate Change Response [제2차 기후변화대응 기본계획]' (2019) <http://me.go.kr>.

9 The Government of the Republic of Korea, '2050 Carbon Neutral Strategy of the Republic of Korea: Towards a Sustainable and Green Society' (2020) <https://unfccc.int/sites/default/files/resource/LTS1_RKorea.pdf>.

10 See S Suk, 'Survey on the Impediments to Low Carbon Technology Investment of the Petrochemical Industry in Korea' (2016) 133 J. Clean. Prod. 576–588.

11 International Energy Agency, 'World Energy Balances' (International Energy Agency 2020).

three quarters of 2020, amid the COVID-19-induced lower needs for electricity generation, coal power generation has declined by 10 per cent, contributing to a significant reduction of imports. Although imports have shown signs of tepid rebound in the early 2021, they are set to remain below pre-pandemic levels in the short-term with key sectors such as the metallurgical industry contributing to reduce Korea's dependency on foreign coal.[12]

Under the Moon's administration the political will and budget allocation to reduce the carbon content of economic and industrial activities have significantly increased. But the above recent trends in the global coal industry and the shocks stemming from the pandemic have further reinforced the energy-transition sentiment. In the most recent national energy plan, the 9th Basic Plan on Supply and Demand of Electricity (9th S&D Basic Plan) that covers the period between 2020 and 2034, Seoul articulated its endeavours to achieve carbon neutrality through three interrelated goals: expanding new and renewable energy facilities; accelerating the phase-out of domestic coal and nuclear power production; and relying on LNG to compensate for the expected changes in generation capacity in the short-medium term. Accordingly, 30 of the existing 60 coal-fired plants (15.3 GW) will be shut down and 24 of these 30 will be converted to LNG power plans for an estimated 12.7 GW of new gas-fired generation capacity.[13] As anticipated, coal and nuclear phase out should proceed in parallel, therefore, 11 of the country's 25 existing nuclear power plants (9.5 GW) are expected to be switched off by 2034. Although nuclear power is a carbon-free energy source, Moon's strong push to nuclear decommissioning that was first announced during the 2017 presidential campaign, in which four out of five candidates made the same promise, reflects the evolution of public sentiment towards nuclear energy. In the aftermath of the Fukushima disaster and the following scandal in South Korea of false safety tests of many nuclear parts, public trust in the management of nuclear plants decreased.[14] Adding to that, a series of earthquakes that occurred between 2016 and 2018 and typhoons that hit the Korean Peninsula in summer 2020 put under severe stress the reliability of the nuclear fleet.

To keep the promise of 'safe and clean energy', the expansion of renewable energy contribution to the energy mix is pivotal. The 9th BP vows to increase the target for installed green power capacity from 15.1 to 40 per cent by 2034, setting an even more ambitious target than the 33 per cent increase by 2030 (8th BPE 2017–2031). But so far this has been an uphill struggle due to various constraints. At territorial level, for example, authorities have dealt with the resistance from local stakeholders particularly in the provinces of North Jeolla and South Jeolla that are going to host most of the offshore wind projects, to which they have responded with development models favouring the co-existence of these projects with the fisheries industry and residents' equity participation. Overall, the main problem continues to be the high cost of renewable-produced electricity compared with thermal and nuclear generation amid the lack of grid parity. Aside from advancements on the prediction, grid and storage system set to progressively handle the intermittent nature of renewables, government subsidies will still be required to guarantee the key growth of solar and wind power that is the fulcrum of the renewable energy strategy. In this regard, the renewable energy subsidy scheme needs careful recalibration to avoid missing the target of expanding offshore wind power from 3 per cent in 2022 to 23.8 per cent by 2030, and solar power generation to 38.9 per cent in 2030. As noted by SFOC, since 2014, the tide of utilities' investments has grown but has mostly been directed towards supporting the biomass at the expense of wind and solar.[15] Moreover, even when coal is outcompeted by renewables, the South Korean government will still face the challenge of adjusting the energy and electricity pricing policies to the shifting scenarios. Due to the conspicuous incentives to consumption inherent in its domestic

12 International Energy Agency, *Coal 2020: Analysis and Forecast to 2025* (International Energy Agency 2020).

13 Ministry of Trade, Industry and Energy of the Republic of Korea, '9th Basic Plan on Supply and Demand of Electricity (2020–2034) [제9차 전력수급기본계획 (2020–2034)]' (2020) <http://www.motie.go.kr/motie/ne/presse/press2/bbs/bbsView.do?bbs_seq_n=163670&bbs_cd_n=81> accessed 31 January 2021.

14 E Park, 'Positive or Negative? Public Perceptions of Nuclear Energy in South Korea: Evidence from Big Data' (2019) 51 Nuc ET 626–30.

15 S Kim and J Kim, 'Can Biomass Qualify as Renewable Energy? The State of Biomass Policy in South Korea' Solutions for Our Climate (2020) <http://www.forourclimate.org/research/biomass_eng> accessed 20 May 2020.

energy environment (eg the second lowest electricity prices in the IEA), successive administrations have refrained from reforming the pricing system, fearing the significant social costs associated with higher energy prices in the absence of proper social safety nets.[16]

In the context of developing alternative energy sources, the hydrogen sector has attracted much interest as the government aims to source from it around 5 per cent of power consumption by 2040. Although hydrogen is part of the government's plan to address GHG emissions and fine dust, at least in the initial stage, hydrogen will be produced through 'carbon intensive processes from petrochemical plans or natural gas reforming without carbon capture and storage.'[17] In fact, the main rationale behind the strive towards hydrogen follows an agenda in which arguably economic growth and competitiveness appear more prominent than environmental concerns given that, even before the pandemic, the South Korean economy was struggling in the face of stiff competition from China and Japan within the global supply value chain. Following the Road Map for Promoting Hydrogen Economy that in January 2019 disclosed policy targets relating to hydrogen mobility (ie hydrogen fuel cells and hydrogen production, storage and transportation), the recent Green New Deal aims to encourage investments by domestic companies to 'develop source technology for the entire cycle from production to utilization of hydrogen.'[18] The promotion of hydrogen power is not new to South Korea and it can be traced back to President Roh Moo-hyun (2003–2008). However, the momentum did not survive the change of administration and it took 20 years for Hyundai Motor Group to launch the world's first fuel cell electric car. Hoping to leverage on the potential 'first comer' advantage of domestic producers, the current administration has placed its bet again on the transportation sector as the fulcrum of its hydrogen-related strategy. Aside from policy support, under President Moon domestic firms have been given a hydrogen-related legal framework through the Hydrogen Economy Roadmap, the Hydrogen Economy Promotion and Safety Management Act (Hydrogen Act) that is the world's first act relating specifically to the hydrogen economy. Arguably, this bodes well for policy continuity considering the well-known consistency issues associated with South Korea's strong executive and single 5-year presidential term.

3. ROLE OF NATURAL GAS

As anticipated, the third component of the energy transition strategy revolves around the LNG sector, which seems to have tailored a special role to bridge the current re-aligning around renewable energy and enhance the readiness of the entire energy system to unexpected events. Natural gas is the third-largest energy source in South Korea's total TPES, behind coal and oil, and is the largest fuel in the total final energy consumption, following oil and electricity. Among the top gas-consuming sectors, heat and power generation account for 54 per cent ahead of the residential and industrial sectors. In the aftermath of policies implemented to diversify the South Korean economy and lessen its dependence on coal and oil, natural gas annual consumption grew by an impressive 14 per cent between 1990 and 2010, passing from 3.2 bcm to nearly 45 bcm. The upward trend continued until 2018, albeit at a slower pace, with the highest growth in TPES among the fossil fuels Figure 1. Competition with coal power generation and nuclear plant availability should be considered as the main factor influencing Korea's gas demand, together with international economic developments that have accentuated the impact of winter consumption spike differentials.[19] In contrast to the previous Plan, the Moon's 13th Plan for the Long-Term Natural Gas Supply and Demand

16 Project interview, August 2020.

17 S Kan 'South Korea's Hydrogen Strategy and Industrial Perspectives' (2020) IFRI, Édito Énergie, 4. <https://www.ifri.org/en/publications/editoriaux-de-lifri/edito-energie/south-koreas-hydrogen-strategy-and-industrial> accessed 28 February 2021.

18 JH Lee and J Woo, 'Green New Deal Policy of South Korea: Policy Innovation for a Sustainability Transition' (2020) 12 Sustainability 23, 10.

19 Since 2009, the peak demand for gas in the winter period has surpassed the summer levels. Nowadays, around 45 per cent of the annual gas consumption is condensed in the annual coldest months, from November to February. International Energy Agency, 'Korea Energy Policy Review' (2020) 139–155.

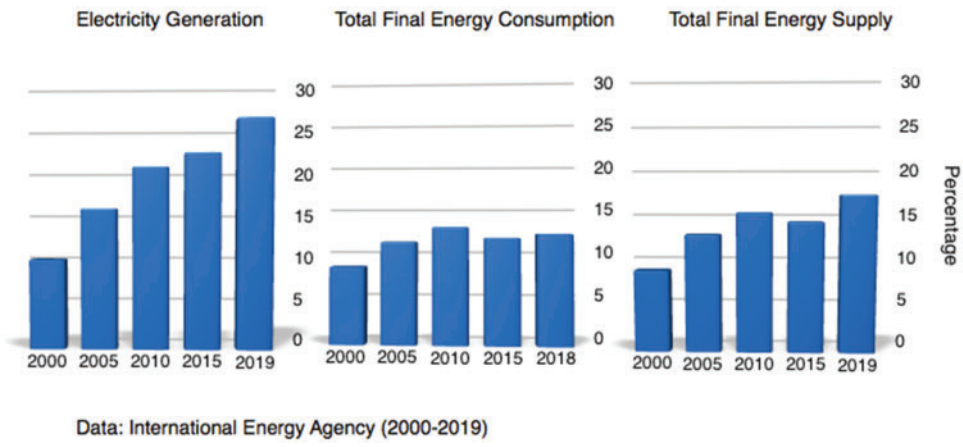

Figure 1. Natural gas in South Korea (2000–2019).

Source: Authors' elaboration based on data from International Energy Agency database, accessed in February 2021.

(LTNGSD) (2018–2031) foresaw natural gas demand to increase, with a significant difference regarding the nearly doubling of gas consumption in the power generation mix.[20] Also, the country's pricing policies have exerted a significant impact on the long-term prospects for the gas sector. Within the IEA member countries, Korea's industrial gas prices are among the highest. After a peak in 2014 that reflected developments on the international energy markets, gas prices decreased by more than 40 per cent in the following years. A similar trend was registered by household prices, which surpassed that of industrial use, albeit fairly below the average of other IEA members.[21]

South Korea has a very negligible gas production capacity that is concentrated in major blocks operated by Korea National Oil Corporation (KNOC) and located in the Eastern offshore basin. Since the two gas fields have a cumulative daily production of approximately 27 million scf, domestic production covers only a fraction of total gas consumption, thus, gas demand depends almost completely on imports. In 2019, South Korean imports stood at 55.6 bcm in the face of an annual consumption of 56 bcm of natural gas, slightly decreasing from the 2018 records of 60.2 and 57.8 bcm, respectively. Besides, due to geopolitical constraints preventing South Korea from connecting to the Eurasian gas producers through a land pipeline, such large volumes of natural gas should be imported in the form of LNG. On the other hand, by pursuing very diversified import strategy, Seoul's import partners have gone from 7 in 2002 to 15 in 2019, representing 11.3 per cent of global LNG market share.[22]

Gas regulatory framework

The overall regulatory framework of individual energy resources (ie license; reporting and registration) rests within the Ministry of Trade, Industry and Energy (MOTIE) while the Prime Minister's Office is mainly responsible for overseeing macroscopic energy policies through the Basic Law and the Framework Act. The latter should be considered as the general law on energy policies and national strategies, establishing its basic

20 While the 12th LTNGSD predicted an annual average of −0.34 per cent of gas demand between 2015 and 2029, the 13th LTNGSD estimates an annual average increase by 0.81 per cent until 2031. According to the latter, demand for industrial-use city gas is expected to increase by an annual average of 1.73 per cent and demand for city gas is expected to grow by 1.24 per cent. Overall, the two plans foresee a conspicuous difference in LNG demand of, respectively, 34.65 mt/y by 2029 and 40.49 mt/y.

21 As in the USA, gas prices for Korean industrial users are not charged with any direct tax component. Instead, Korean households' gas prices are around 9 per cent, which is significantly lower than other IEA members.

22 International Group of Liquefied Natural Gas Importers, GIIGNL Annual Report 2020 (2019)

and comprehensive principles relating to climate change and energy issues, the role of market in promoting low carbon and green growth, the optimization of infrastructural assets along with the re-organization of the tax and financial systems to include externalities on the environment.[23] The Ministry of Environment and Ministry of Foreign Affairs participate by deliberating on energy-related issues in the framework of international negotiations over climate change and emission rules whereas their influence on the gas governance is rather indirect. Since 1992, every 2 years, the government issues the LTNGSD, which contains the long-term demand and supply outlook as well as plans for natural gas infrastructural development and import security, and together with the government's EMP and the biannual S&D Basic Plan devise Korea's gas policies and governance. In South Korea, the governance of the natural gas industry was largely shaped by the kind of industrialisation process wherein the state used to play a decisive role through active intervention in the economy. Amid the collaborative relation that was forged with dominant society forces under the authoritarian government, also for the sake of the latter's legitimation, selected family-run firms (*chaebol*) and state-owned enterprises (SOEs) received large amounts of capitals and protection from the government to gain scale economies and face international competition. Also, the government introduced a command-and-control approach within the major network industries sector.[24] In this context, a clear distinction between policy objectives and commercial goals could hardly be drawn. In the government's view, energy-intensive sectors such as steel, machinery, chemical, non-ferrous metal, electronics and shipbuilding had to lead the economy towards a structural change, in light of the increased importance attached to capital intensive planning and the sectoral contribution to GDP, thereby they became some of the country's largest SOE-dominated industries.[25] On the other side, the credit-based system that tied firms to state's priorities and protected them from market turbulence through subsidies, forced mergers and acquisitions favoured strong personal networks in the administration of state-related entities.[26] As a result and amid insufficient oversight and accountability, South Korea's business and politics have been frequently roiled by scandals involving the energy industry as well.[27]

Within this context, in December 1982, KOGAS was established to promote 'convenience in the lives of citizens and improve public welfare' through the stable and long-term supply of natural gas.[28] The decision came in the aftermath of the Second Oil Crisis amid ramping inflation rates and high dependency on foreign oil imports that dominated the primary energy and electricity mix. The decision to set up KOGAS, therefore, originated from the government's necessity to use natural gas as a reliable and relatively cheap alternative to other fuels. Inspired by the 'single-buyer' market model, KOGAS stakes that are currently directly and indirectly owned by the state account for 54 per cent of the total.[29] KOGAS manages a national network of 5393 km trunk pipeline, 77 storage tanks and 5 LNG import terminals, with a peak capacity of 6.1 trillion cubic feet (Tcf) per year and an average estimated utilization rate of 31 per cent.[30] As of 2019, KOGAS

23 The Framework Act on Low Carbon, Green Growth is the first to integrate previously separated policy areas (ie climate change, GHG emissions, renewable energy and sustainable development) into the same legal framework. Republic of Korea, 'Framework Act on Low Carbon, Green Growth' (2010) <http://eng.me.go.kr/board.do?method=view&docSeq=8744&bbsCode=law_law_law> accessed 10 March 2019.

24 CN Il, 'Recent Developments in the Public-Enterprise Sector of Korea' in T Ito and AO Krueger (eds), *Governance, Regulation, and Privatization in the Asia-Pacific Region* (The University of Chicago Press 2004) 96.

25 JK Galbraith and J Kim, 'The Legacy of the HCI: An Empirical Analysis of Korean Industrial Policy' (1998) 23 J Econ Dev 1.

26 AH Amsden, *Asia's Next Giant: South Korea and Late Industrialization* (Oxford University Press 1989).

27 DC Kang, *Crony Capitalism: Corruption and Development in South Korea and the Philippine* (Cambridge University Press 2004); P Andrews-Speed, 'South Korea's Nuclear Power Industry: Recovery From Scandal' (2020) 12 JWEL&B 1, 47–57; J Fendos, 'South Korea's Corruption Culture' *The Diplomat* (November 2016) <https://thediplomat.com/2016/11/south-koreas-corruption-culture/> accessed 15 October 2019.

28 As noted by Il (n 24), based on the classification of corporations in which the government has an interest, KOGAS is a government-invested corporation (GIC), with a more independent management compared to government-owned corporations (GOCs), closely aligned with policy-oriented objectives, and with stronger commercial orientation and more freedom to manoeuvre from the government.

29 KOGAS, 'Investor Presentation: Results of 1Q FY 2019' (May 2019) Slide 26 <https://www.kogas.or.kr/> accessed 5 February 2021.

30 U.S. Energy Information Administration, 'South Korea' (October 2020) <https://www.eia.gov/international/content/analysis/countries_long/South_Korea/south_korea.pdf> accessed 5 February 2021.

facilities represented more than 90 per cent of the country's total gas storage capacity, therefore, it is a key actor in terms of national gas security. Having secured the rights to build, manage and operate all receiving LNG facilities in the country, including storage and transmission infrastructures, KOGAS makes a unique example of clear-cut monopoly in the natural gas industry amongst the OECD countries. Within the framework of the 3rd EMP, the government and KOGAS agreed to boost CAPEX by the mid-2020s and expand the amount of domestic infrastructure spending. As the sole buyer in South Korea, KOGAS provides access to upstream energy resources in producing countries and on the basis of the impressive amount of its gas imports, it has become one of the world's leading corporate buyers of LNG.[31] So far, the company has largely secured long-term contracts with gas prices tied to oil-linked indexation. In this regard, since the main responsibility of KOGAS has not been that of delivering massive returns to the government's domestic investment, the goal of securing sufficient supplies of gas has largely been predominant over profit concerns. Moreover, given that wholesale tariffs have been calculated on cost-plus supply margin on the operating costs, KOGAS has been rather protected from the impact of major market volatilities and its operating income guaranteed, while charging final consumers mainly through the gas used in the electricity market. The average high import prices have become a rather concerning problem because of the negative effects of the so-called Asia-Premium, which has unleashed substantial additional costs on energy including in the power generation business, becoming a burden on the competitiveness of the Korea economy.[32] At the same time, amid the changing conditions of the global market and due to the short notice needed to respond to rapidly increasing demand, the peculiar role within the gas system has often caused KOGAS to lose much of its bargaining power when contracting major long-term deals.[33] This has affected the competitiveness of natural gas over alternative fuels in the domestic energy mix as well as the economic viability of Seoul's energy policies and strategies. Nevertheless, KOGAS dominance of the gas sector has been guaranteed by the absence of an independent gas regulator given that MOTIE is the only authority to oversee the implementation of the gas policies and set wholesale and retail prices of gas, in addition to being the arbitrator for third-party access (TPA) to the transmission and distribution network, managed by KOGAS. To integrate KOGAS operations with the development of a national gas business, the Urban Gas Business Act (UGBA) was introduced in 1983. After several amendment rounds, the Act defines the role of different gas businesses categories including urban gas, gas producers and manufacturing and retail businesses. It also establishes a clear division of responsibilities between KOGAS, the only wholesale sector operator and urban gas companies, which own local distribution pipeline network and should distribute gas to retail customers.[34] As of 2021, there are 34 city gas companies operating in Korea. UGBA has established a licensing system for operating in a specific region throughout an exclusive franchise system, which requires each participant in the gas supply chain to present every year a non-binding 5-year supply plan to the local government.[35] In addition, the UGBA establishes strict regulation for operating any typology of business relating to import or export of natural gas.

31 As of 2019, the company has secured approximately 86 per cent of annual Korean gas imports and has been participating in around 24 projects in 13 countries, 2 projects as operator and 22 as a non-operator. See KOGAS (n 29) Slides 17–26.

32 W Kate, L Varró, A-S Corbeau, 'Developing a Natural Gas Trading Hub in Asia: Obstacles and Opportunities' (2013) OECD/IEA; G Choi and E Heo, 'Estimating the Price Premium of LNG on Korea and Japan: The Price Formula Approach' (2017) 109 Energy Pol'y 676–684.

33 A Flower and J Liao 'LNG Pricing in Asia' in J Stern J (ed), *The Pricing of Internationally Traded Gas* (Oxford University Press 2012) 338-374.

34 Republic of Korea, 'Urban Gas Business Act' (1983) <https://elaw.klri.re.kr/eng_mobile/viewer.do?hseq=22292&type=new&key=> accessed 15 February 2021.

35 Korea City Gas Association <http://www.citygas.or.kr/company/situation.jsp> accessed 28 February 2021.

4. LONG-DRAWN PROCESS TO REFORM KOREA'S GAS INDUSTRY AND GOVERNANCE

Reform initiatives before 2017

Between the mid-1990s and the mid-2000s, various policymakers and energy think tanks voiced the need to introduce some serious reforms to the gas governance. The reform process was carried out in parallel with a major restructuring of the South Korean SOEs, even though it was slowed down in the aftermath of the AFC. As the Kim Dae-jung's government sought to mitigate the impact of the AFC, the privatization of major SOEs seemed a viable option to attract domestic and foreign capitals that could shoulder the crisis' costs and respond to the IMF demands. To do so, the government was expected to gradually give away its shares in GOCs and GICs ownership. However, the plan lacked clarity on several major points mainly due to the contradictory relationship between the government itself and the financial and corporate sector against the backdrop of the long-held state's preference for a command-and-control approach and a growing anti-establishment sentiment.[36] In 1999, the Basic Plan for Restructuring the Gas Industry was unveiled, according to which, a more market-oriented governance of the gas industry was desirable and a new relationship between state and market actors should be sought. Specifically, the Plan envisaged the division of KOGAS into three subsidiaries, two of which to privatise, the delayed signing of new long-term contracts and the establishment of a specific regulatory commission for the gas sector. Moreover, the Plan mandated the practical unbundling of KOGAS into two business fields (import/wholesales activities and terminal/transmission network) and the introduction of TPA for LNG terminals and pipeline network to favour competition in the import and retail business.[37] However, changing political conditions and rising concerns over energy security stood in the way of the Plan's implementation. After the National Assembly rejected the amendments, the opposition to the reforms further coalesced under the Roh Moo-hyun's administration that was more prone to accommodate the calls from the Korean labour unions to halt the privatization process. On the other hand, several gas shortages challenged the KOGAS-centred single buyer model of internationally-sourced gas.[38] Between 1998 and 1999, the introduction of the Petroleum Business Act and the City Gas Business Act led to halt KOGAS import monopoly and management of LNG importing infrastructures, thereby leaving space for direct imports to direct users in industrial and power generation businesses throughout the construction and management of private LNG terminals. South Korea's steel-maker POSCO and K-Power built the country's first-ever privately operated LNG terminal in Kwangyang, being able to get an import license and finalize a transmission contract with KOGAS, which de facto ended its monopoly by 2005, and a 20-years supply contract from BP at a favourable price. However, as soon as KEPCO's non-nuclear generation companies secured a license for LNG direct imports from MOTIE and started to compete with KOGAS for the same gas supplies, the issuance of new direct import permits became politicised. To make things worse, South Korean companies started to compete amid the rising gas sellers market conditions.[39] While KOGAS and KEPCO managed to conclude a 20-year agreement that excluded additional gas volumes, the opposition to direct gas importers grew amongst the lawmakers. In response to that the government scaled back its ambitions and guaranteed that KOGAS would be the sole to import LNG from 2006 to 2012.

Nevertheless, domestic and international calls to further liberalize the Korean energy and gas market did not stop. As repeatedly pointed out by the IEA, the main hurdle has been the lack of a clear long-term vision about the development of the domestic energy market. Because the South Korean response to various irksome stress tests such as blackouts, shortages and international price peaks was shaped by entrenched

36 S Haggard, D Pinkston, JK Seo, 'Reforming Korea INC.: The Politics of Structural Adjustment Under Kim Dae Jung' (1999) 23 Asian Perspective 3, 201–235; IC Nam, 'Recent Developments in the Public-Enterprise Sector of Korea' in Ito T and Krueger A (eds), Ibid.

37 JK Seo, *An Analysis of Policy Issues in Natural Gas Industry Restructuring* (Korea Energy Economics Institute 2001); SG Kim and JS Shin, 'Energy Sector Restructuring in Korea' (2002) Int'l Fin LR 27–30.

38 AMZ Gao, 'Regulating Gas Liberalization: A Comparative Study on Unbundling and Open Access Regimes in the U.S., Europe, Japan, South Korea, and Taiwan' (2010) Kluwer L Int'l 248–249.

39 KW Paik, 'Natural Gas in Korea' in J Stern (ed.) *Natural Gas in Asia* (2nd edn, Oxford University Press 2008) 199–201.

interests and scepticism about liberalization, KOGAS managed to keep its privileged position. In fact, Seoul should have carried out specific interventions to achieve a successful liberalization including getting rid of prescriptive government planning, introducing a market-based trading system of wholesale power, strengthening the implementation of TPA rules implementation, and removing entry barriers in both the gas and power sectors.[40] In this context, KOGAS continued to bear the pressure of rising oil prices while the government subsidised part of its losses. On the other hand, in the late 2000s, many in Seoul feared that an upward adjustment of gas prices could lead to higher inflation rates and massive increase in power generation costs. Nevertheless, amid an outstanding accumulated deficit, between 2008 and 2013, KOGAS managed to recoup some of the import costs through higher prices in the wholesale market charged to city gas companies. In those years, the influence of the Lee Myung-bak's administration over KOGAS international investments in the context of Lee's energy diplomacy decisively affected the company's policies with negative effects for its financial soundness due to the massive public investments poured in the face of abysmal results. In the end, these directly contributed to the same upward revision of the domestic gas prices.[41] Again, under President Lee plans to allow direct imports by private companies and diversify gas imports came under renewed consideration. However, winter spot and short-term procurement that had risen since 2002 continued in parallel with a surge in gas utilities, due to household and heating services, and were cemented by the restructuring of the electric power industry that included the division of KEPCO in six sub-entities.[42] The 10th LTNGSD (2010–2024) and the 2nd EMP (2014–2035) delivered a new wave of priorities for the gas governance according to the principles of import security, competitiveness of import contracts and independent LNG development capabilities to be achieved also through a stricter control over TPA clauses. Both documents encouraged the nationwide expansion of the gas supply infrastructures, including adopting winter demand control measures and a special task force to manage possible crises, introducing more flexibility in the existing and new contracts, and increased price transparency to reflect international fluctuations.[43] However, as in the previous years, some of the main issues were largely untouched, particularly the unbundling of natural gas utilities along vertical and horizontal lines, the opening of the wholesale gas markets to new entrants and the lack of a proper market regulator. Once more, the predominant role of KOGAS was left rather unchallenged. On the other side, following the Fukushima disaster and the price upsurge in the first half of 2010s, the ramping up of LNG prices in the Northeast Asia markets harshly impacted on the affordability of gas consumption. After South Korea weathered the 2008 global financial crisis and closed down some of its nuclear power plants, between 2010 and 2013, the growing demand for electricity and gas-fired generation led KOGAS to forecast an increased role for gas in Korea's primary energy mix to face rising domestic power generation consumption.[44] However, following two consecutive warm winters and a renewed increase in nuclear power production, the administration of Park Geun-hye (2013–2017) expected flat gas consumption by 2030 (7th S&D Basic Plan) and the drop of gas demand below the threshold of 35 mtpa by 2029, and it scaled-down the overall power demand targets (EMP

40 International Energy Agency, 'Energy Policies of IEA Countries: The Republic of Korea Review' (International Energy Agency 2006).

41 KOGAS yearly debt and debt ratio have continuously increased since 2009 and 2010, peaking at the end of the Lee's administration <http://www.alio.go.kr/popReportTerm.do?apbaId=C0147&reportFormRootNo=63601>. Hankyoreh, 'Lee Myung-bak's Overseas Resource Development Just Debt-Ridden Farce' (Seoul, 28 October 2014), <http://english.hani.co.kr/arti/english_edition/english_editorials/661782.html> accessed 15 October 2019; SA Snyder and LE Easley, 'South Korea's Foreign Relations and Security Policies' in SM Pekkanen, R Foot, J Ravenhill (eds) *Oxford Handbook of the International Relations of Asia* (Oxford University Press 2014) 446–461.

42 TH An, 'Supply and Demand Trends and Plans for Natural Gas in South Korea' (2009) Energy Working Papers 22967, East Asian Bureau of Economic Research. An additional element that affects the rising costs of LNG imports has been the inability by KOGAS to negotiate S-curves into oil indexation prices in many long-term contracts.

43 Ministry of Knowledge Economy of the Republic of Korea, '10th Plan for Long-Term Natural Gas Supply and Demand 2010–2024' (2010); Ministry of Trade, Industry & Energy of the Republic of Korea, 'Korea Energy Master Plan: Outlook & Policies to 2035' (2014).

44 KOGAS, 'Presentation to Investors' (July 2014), Slide 17 <https://www.kogas.or.kr/> accessed 20 June 2019.

2014–2035).[45] Against the backdrop of conflicting messages from agencies and ministries within the same administration regarding the future of gas consumption, in 2016, the government sought a significant re-shaping and opening up of the national state-controlled energy supply market and announced a new roadmap regarding LNG imports to be published the following year. The plan was expected to gradually lift barriers to domestic gas importers (ie POSCO, SK E&S, KOMIPO and GSCaltex) and foresee the possibility to resell natural gas on the domestic market by 2025. In the government's view, direct importers would become completely independent from KOGAS to negotiate autonomously on the international markets. By aiming for more competition, direct importers would be encouraged also to look for cheaper supplies and more flexible market conditions that could lead to lower prices within the domestic market.[46] However, the removal of the conservative president from office, in December 2016, following an impeachment procedure, and the election of the progressive Moon Jae-in, in May 2017, shook as well the political environment in which to elaborate the reforms of the natural gas governance and industry.

Reforms under the Moon Jae-in administration (2017–)

Based on the analysis so far, it can be argued that over the past 30 years South Korea's energy system has experienced frequent changes of direction as the focus shifted from a closed system of limited participation to one of a wider range of participants. This dynamic could be said to have slightly reflected also the different ideas about governance of the conservative and progressive administrations.[47] In accordance with the South Korean progressives' long-promoted vision of a participatory governance of state affairs, and following the peculiar circumstances that led to Moon's election (eg the massive peaceful candlelight protests), the current progressive administration has sought to engage with the public also in the field of energy policy including through public deliberations on the nuclear plants decommissioning.[48] Whilst the government has undertaken greater efforts to widen the support for its energy transition goals, South Koreans seem to hold positive views of the role of natural gas as a pillar of the country's energy policy for at least the next 15 years.[49] During his presidential campaign, Moon Jae-in called for increasing gas consumption to facilitate domestic energy transition away from nuclear and coal energy and foster environmental protection. Although shortly after his election, Moon was forced to reconsider the path through which to achieve his goals given that, in the meantime, gas had been losing ground in the competition with coal. Moreover, amid the temporary shutdown of some nuclear plants to carry out maintenance, coal-fired generation reached a new record high, which confirmed the need to make natural gas more competitive to speed up coal phase out.[50] Given the above unfolding trends and to keep his electoral promises, from the beginning of his term, President Moon was confronted with the urgency to deal with

45 Offshore Energy, 'South Korea's Gas Demand to Drop 5 Percent by 2029' (28 December 2015) <https://www.offshore-energy.biz/south-koreas-gas-demand-to-drop-5-percent-by-2029/> accessed 15 December 2019.

46 J Fick, 'S Korea to Allow Buyers to Bypass LNG Directly From 2025' *S&P Global Platts* (Seoul, 14 June 2016) <https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/061416-s-korea-to-allow-buyers-to-bypass-kogas-import-lng-directly-from-2025> accessed 10 December 2019; B Lefebvre, 'South Korea to Liberalise LNG Imports in 2025' *ICIS* (16 June 2016) <https://www.icis.com/explore/resources/news/2016/06/16/10008434/south-korea-to-liberalise-lng-imports-in-2025/> accessed 10 December 2019.

47 DY Kim, 'Energy Governance in South Korea: Long-Term National Energy Master Plans Since 1997' (2020) KDI School of Public Policy Management, Working Paper 20-03.

48 Project interviews in Seoul, July 2019.

49 B Kennedy, A Spencer, C Funk , *Natural Gas Viewed More Positively Than Other Fossil Fuels Across 20 Global Publics* (Pew Research Center 2020) <https://www.pewresearch.org/fact-tank/2020/10/19/natural-gas-viewed-more-positively-than-other-fossil-fuels-across-20-global-publics/> accessed 18 February 2021.

50 S Patel, 'South Korea: On the Brink of Coal-to-Gas Displacement' *IHS Markit* (2 October 2017) <https://ihsmarkit.com/research-analysis/south-korea-on-the-brink-of-coal-to-gas-displacement.html> accessed 20 May 2020; D Proctor, 'Coal Generation Reaches New High in South Korea' *Powermag* (1 April 2018) <https://www.powermag.com/coal-generation-reaches-new-high-in-south-korea/> accessed 20 May 2020.

issues such as the revision of policy tools, electricity tariff rates and environmental and social taxes.[51] By the means of sorting out these additional costs, the government's aim was to gain a safer and cleaner mix in which natural gas could substitute coal by eroding its competitiveness, while strengthening the stability of gas supplies in the face of the phase-out of nuclear power. It should be noted that despite Moon's pledge to halt the construction of new nuclear facilities, at least seven new coal-fired power plants are expected to be built by 2034, in accordance with contracts stipulated by his predecessor, which makes the economic and political implications of the current government's energy plan even more significant.[52] To bolster the coal-to-gas switch and curb air pollution, between 2018 and 2019, the government increased the costs for coal-fired power generation while reducing those for gas-fired power generation. Additionally, import taxes on natural gas were lowered by as much as 74 per cent. Against this backdrop, MOTIE promised to refund LNG use for combined heat and power business. However, on the basis of the average import prices of LNG in the 2018–2019 period and the new tax revisions, coal is likely to keep a price advantage over LNG procured by KOGAS via imports, the majority of which is regulated under long-term contracts.[53]

Given Korea's dependency on foreign gas, concerns over price and stability should be addressed by considering also the management of future imports that is affected by relevant contractual clauses. Echoing Jonathan Stern, today's gas market liberalization brings forward the issue of promoting the efficiency of the overall sector amid attempts to achieve carbon reduction targets. In this context, the focus should shift from the issue of supply security to that of price security because customers buy the cheapest gas available regardless of its origins.[54] Accordingly, the decarbonisation of the energy system through LNG cannot ignore affordability and profitability of new natural gas policies and projects.[55] In the Asia-Pacific region, take-or-pay agreements and long-term contracts are still the predominant form of arrangements but forms of market integration and competition are developing. Slowly, increased flexibility has been introduced through revising destination clauses that allow additional buyer flexibility and different pricing methodologies, overcoming structural elements that are conducive to the persistent Asia Premium.[56] Because of that, regulatory authorities in South Korea and Japan have been leading efforts to legally contest this system through arbitration to reduce companies' exposure to international market volatility.[57] In turn, this calls for reviewing the relationship between KOGAS and the other industry stakeholders. Against this backdrop, the 13th LTNGSD (2018–2031) included the introduction of a renewed flexibility provision in the LNG procurements, enhanced international cooperation with other buyers, and the provision of new supply stability improving the supply portfolio diversification. The document favoured also the dialogue between different gas industry stakeholders through the discussion council. The draft version of the 14th LTNGSD calls for an

51 S Cornot-Gandolphe, 'South Korea's New Electricity Plan: Cosmetic Changes or a Breakthrough for the Climate?' *IFRI* (2018) <https://www.ifri.org/en/publications/editoriaux-de-lifri/edito-energie/south-koreas-new-electricity-plan-cosmetic-changes-or> accessed 20 May 2020.

52 C Lee, 'S Korea to Increase LNG-Based Power Capacity by 43% to 59.1 GW in 2034' *S&P Global Platts* (Seoul, 29 December 2020) <https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/122920-s-korea-to-increase-lng-based-power-capacity-by-43-to-591-gw-in-2034> accessed 5 January 2021.

53 MOTIE specifically set the new import taxes with the aim of increasing LNG in power generation to over 20 per cent and bring coal's portion under 40 per cent. Lee C, 'South Korea to Cut LNG Taxes by 74% in April, Raise Thermal Coal Tax by 27%' *S&P Global Platts* (1 February 2019) <https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/020119-south-korea-to-cut-lng-taxes-by-74-in-april-raise-thermal-coal-tax-by-27> accessed 21 July 2020.

54 J Stern, 'Can Natural Gas Market Liberalization Be Compatible with Energy Security and Climate Change Concerns?' (December 2018) IEEJ EJ Special Issue; J Stern, 'Challenges to the Future of LNG: Decarbonisation, Affordability and Profitability' (October 2019) Oxford Institute for Energy Studies, OIES Paper: NG 152.

55 Ibid.

56 See International Energy Agency, Korean Energy Economics Institute (2019), 'LNG Market Trends and Their Implications' (International Energy Agency and Korea Energy Economic Institute 2019); K Talus, 'Price Review Arbitration in the Asian LNG Markets—"The Times They Are A-Changin"' (2021) Journal of World Energy Law and Business 1–16.

57 A Ason, Price Reviews and Arbitrations in Asian LNG Markets (April 2019) Oxford Institute for Energy Studies, OIES Paper: NG 144, 4–5.

improvement of the stability and efficiency of gas supplies to Korea in response to the expected needs over the next 15-year period. Moreover, the gas industry is expected to expand its infrastructural system and utilization rates. In the same spirit, the 3rd EMP (2019–2040) gives direct importers greater responsibility in ensuring the stable supply and demand of gas and stresses that the principles of efficiency and fairness of market rules should be secured through improving the rate system of KOGAS in power generation.[58] In the beginning of 2020, an important innovation in the relationship between the state-run gas company and the power utilities was announced. Accordingly, KOGAS is expected to introduce a new 'individual tariffs system' by 2022 to charge utilities separately through bilateral negotiations instead of seeking direct LNG imports. According to KOGAS, the individual tariffs system will also grant the SOE a bigger purchasing leverage on behalf of direct importers on the international markets, with a cascade effect on the wholesale and retail prices, thus securing a significant discount for utilities from lower prices obtained by KOGAS.[59] Despite the expected results flaunted by the administrations over the years, KOGAS monopoly has continued to hold strong. Indeed, it currently accounts for 92.7 per cent of the market share for city gas and 78.7 per cent of power generation. As of 2020, 11 direct importers including large industrial consumers and generation companies could import their own gas for their own use, but only if prices agreed with suppliers remained lower than those agreed under KOGAS long-term contracts. Still, direct importers are forced by market rules to use their own gas, eventually swap it or re-export before having received the MOTIE approval, but not to resell it in the domestic market. Nevertheless, direct importers have improved their position. As of 2020, they controlled around 7 per cent of gas market shares for city gas and 21 per cent of the power generation market.[60] The current government is also expecting direct importers, including utilities and industrial users, to further increase their share of South Korea's total LNG imports from 18 per cent recorded in 2019 to around 25 per cent by the early 2030s. In particular, direct importers have prospered under the Moon's administration on the basis of their capacity to intake natural gas through low spot prices as they outcompete KOGAS average import pricing. However, as the new pricing system has been designed, Seoul would attempt to reverse the trend experienced in the last years and give more power to the state-monopolist against direct importers. However, according to government's official, the risk of uncontrolled pricing policies of gas and conflicting positions between KOGAS and direct importers can lead to consumers bearing a large share of the rising gas rates.[61] At the same time, the reform unveils the importance of facilitating direct importers' access to import and transmission facilities, together with the improvement of the information access and management of the available surplus capacity of gas infrastructures.[62] The above discussion becomes even more relevant as a consistent number of long-term LNG contracts with South Korea's top Middle Eastern suppliers are set to expire within the coming years.[63] On this point, Moon has been directly involved in promoting a diversification of Korea's gas import strategy by strengthening partnerships for instance with the U.S. and Russian

58 Ministry of Trade, Industry & Energy of the Republic of Korea, 'Korea Energy Master Plan: A New Energy Paradigm for the Future' (2019).

59 C Lee, 'KOGAS Adopts New LNG Pricing Method to Try Keep S Korean Utilities Off Imports' *S&P Global Platts* (Seoul, 10 January 2020) <https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/011020-kogas-adopts-new-lng-pricing-method-to-try-keep-s-korean-utilities-off-imports> accessed 21 July 2020; B-W Kim, 'KOGAS Overhauls LNG Pricing Method to Tackle Cherry-Picking of Power Utilities' *The Korea Herald* (18 October 2020) <http://www.koreaherald.com/view.php?ud=20201018000153> accessed 21 February 2021.

60 International Energy Agency, *Korea Energy Policy Review 2020* (International Energy Agency 2020) 146–147.

61 JJ Yoo, 'Rep.Lee Dong-Joo, Inevitable to Raise Gas Rates for Direct Gas Imports [국감] 이동주 의원, 가스 직수입 열풍 가스요금 인상 불가피' *GasNews* (Seoul, 20 October 2020) <http://www.gasnews.com/news/articleView.html?idxno=93246> accessed 10 March 2021.

62 C Insoo, 'Potential Disagreements Over the Joint Use of the LNG Pipe Network: The Surface of The Conflict? 수면위로 올라온 LNG배관망 공동이용…갈등 표면화?' *Energy News* (Seoul, 25 February 2021) <https://www.energy-news.co.kr/news/articleView.html?idxno=75492> accessed 10 March 2021.

63 KW Paik, 'South Korea's Energy Policy Change and the Implications for Its LNG Imports' (2018) Oxford Institute for Energy Studies, OIES Paper: NG 132, 5–10.

counterparts. As a consequence, KOGAS has negotiated contracts on long-term gas supplies at more flexible terms and expanded the geography of its traditional suppliers, while other Korean companies, particularly in the shipbuilding sector, have capitalised on these cooperation efforts.[64]

5. FUTURE OF KOREA'S GAS INDUSTRY IN THE FACE OF COVID-19 AND SEASONAL PRICE SHOCKS

The outbreak of the pandemic and its socioeconomic fallouts has sent shockwaves throughout the energy system. Amid slashing consumption and demand, enhanced uncertainties have spread across an already distressed market in which the gas oversupply has indeed dragged spot gas prices to record-lows at the global level. At the same time, gas supplied under long-term contracts stipulated by Asian buyers has become one of the highest-priced commodities in the world's energy markets.[65] In the first half of 2020, the economic slowdown and temporary shutdowns of industrial facilities, together with warmer temperatures, reduced South Korea's domestic demand of natural gas, which used to be more pronounced at the end of the winter season. Furthermore, following the adjustments to the gas price policing, industrial gas lost much of its competitiveness over other fuels. Still, nuclear and coal-fired plant shutdowns counterbalanced the decreasing gas demand and the Korean coal imports reached a 10-year low amid more stringent anti-pollution policies.[66] However, the shock caused by the global pandemic has produced a double effect whose consequences should be considered against the backdrop of the pivotal role of gas in Seoul's long-term energy strategy. On one hand, in the first 5 months of 2020, Korean LNG imports were driven up by about 14 per cent y-o-y, with direct importers feasting on record low spot prices on the global market and the disappearance of the Asia Premium for much of the same period.[67] On the other hand, KOGAS was prompted to ask for a long-term postponement of long-term cargoes, including some deliveries in 2021 from top suppliers. Moreover, the fact that the company ended the previous warm winter with a high-inventory capacity has further limited the potential for stockpiling additional volumes of gas at available very low prices.[68] Overall, KOGAS data show that the 2020 sales volumes modestly decreased compared with 2019. Nevertheless, the market experienced a tremendous volatile situation and deeper winter spike consumption differentials. Concurrently, the reduced sales price and volume, and the diminished overseas projects' returns and equity profits hit the company's financial situation.[69] The mix of lower-than-average summer temperatures and additional nuclear availability led the LNG imports to register their lowest level in the last 5 years, despite the very low spot import prices available on the market and just a few weeks before the sudden shut down of six reactors due to the typhoon season.[70] Following the end of summer and the low demand season, however, the situation suddenly changed. A series of supply glitches, planned and unforeseen upstream shutdowns of major plants across the

64 F Frassineti and F Sassi, 'Bridging the Gap: Progress and Prospects for Accelerating South Korea's Move Towards a Carbon Neutral Scenario' (2020) On Korea: Academic Paper Series, Korea Economic Institute of America, <https://keia.org/publication/bridging-the-gap-progress-and-prospects-for-accelerating-south-koreas-move-towards-a-carbon-neutral-scenario/> accessed 8 November 2020.

65 International Energy Agency, World Energy Outlook 2020, (International Energy Agency October 2020).

66 KOGAS, Results of First Half of 2020 (August 2020) Slide 4; J Chung, 'South Korea First-Quarter Thermal Coal Imports Set for 10-Year Low on Anti-Pollution Measures' *Reuters* (26 March 2020) <https://www.reuters.com/article/us-southkorea-coal-power-idUSKBN21D0AR> accessed 20 September 2020.

67 International Energy Agency, Gas 2020: Analysing the Impact of the Covid-19 Pandemic on Global Natural Gas Markets (International Energy Agency 2020) 20; Hellenic Shipping, 'S. Korea's KOMIPO, Posco International Jointly Seek LNG Cargo for March' (16 January 2020) <https://www.hellenicshippingnews.com/s-koreas-komipo-posco-international-jointly-seek-lng-cargo-formarch-tender-document/> accessed 21 July 2020.

68 S Stapczynski, 'Top LNG Buyers Seek Cargo Delays as Virus Slashes Demand' *Bloomberg* (15 April 2020) <https://www.bloomberg.com/news/articles/2020-04-15/top-asian-lng-buyer-seeks-to-delay-shipments-deep-into-2020?sref=SamVlrGx> accessed 20 May 2020.

69 A significant CAPEX reduction has been experienced by both domestic and overseas projected investments, respectively, falling by around 29 per cent and 43 per cent. KOGAS, 'Results of Fiscal Year 2020' (February 2021) <http://kogas.kr> accessed 10 March 2021.

70 J Chua, 'South Korea's August LNG Fall to 49-Month Low' *Argus Media* (11 September 2020) <https://www.argusmedia.com/en/news/2140457-south-koreas-august-lng-imports-fall-to-49month-low> accessed 26 November 2020.

world and low export facility utilization rate led to a significant drop in the global gas production. At the same time, a prolonged congestion through the Panama Canal disrupted the main trade route for American LNG to Asia. This development reduced the ability of more flexible supply contracts to meet winter differentials in the Northeast Asian region and led LNG shipping rates to hit multi-year high. To make things worse, an exceptional cold weather hit both Europe and East Asia, the two world's biggest gas basins. In this context, a very illiquid global market led regional short-term price benchmarks to lose contact with time reference to the price spike, thus affecting the Asian LNG importers including South Korea for a much longer period. Following the record lows in April 2020, prices rose 18-fold and outperformed any commodity on the global markets.[71] Amid a record cold snap, freezing temperatures and heavy snowfall brought Korea's power peak demand to reach an all-time high, breaking the 90 million kW for the first time, closing also the gap between reserves and the issuing of an emergency alert.[72] KOGAS and few direct importers rushed to secure some of the highest-ever quoted LNG cargoes for the H2 January-H1 February 2021 period, in a bid to respond to developments in the domestic gas demand. This happened amid a rather mild increase in South Korea's winter gas imports compared with the previous year, whereas a 5-year record selling volume of natural gas from KOGAS to downstream firms helped the country to maintain lower tariffs and mitigate the effects of the skyrocketing LNG prices on the spot market.[73]

6. CONCLUSION

The evolution of South Korea's natural gas sector and the various attempts to introduce more market-oriented reforms have shown the necessity for long-term vision and commitment by the country's regulators, regardless of the circumstances spanning throughout the whole process. For instance, the cases of the United States and Europe, where the gas market liberalization process took more than 20 and 10 years, respectively, confirmed that such a process cannot be achieved over the course of a single administration. While it took decades for the South Korean authorities to reconsider the key role of KOGAS, major sources of concern remain unsolved particularly with regards to whether reforms should affect the company's leadership in the gas sectors. Against the backdrop of closely intertwined political, legal and economic factors, KOGAS privatization has partially failed due to a combination of global market developments and domestic political conditions on which the vested interests to reform the gas governance of various stakeholders have loomed large. In light of the combined effects of the COVID-19 pandemic and the recent global energy prices shocks, natural gas has been the object of renewed political interest towards LNG as a bridge fuel amid the coal-and-nuclear phase out, while also seeking to handle unusually high peak demands to the advantage of South Korea's energy security. As the South Korean energy system tries to cope with uncertainties related to the impact of the present global crisis and the seasonal price fluctuations, KOGAS role is unlikely to downsize. Because of its strategic relevance, it is reasonable to expect that the role of the company will play out even more vividly through expanding its activities in support of the government's new gas policy and strategy.

71 See M Fulwood, 'ASIA LNG Price Spike: Perfect Storm of Structural Failure?' OIES Energy Comment (Oxford Institute for Energy Studies 2021).

72 Energy Economy Newspaper, 'The Highest Demand For Electricity in Winter During the 'Arctic Cold Wave' 북극 한파' 에 겨울 최대전력수요 사상 최고' ' (Seoul, 7 January 2021) <https://ekn.kr/web/view.php?key=20210107010001462> accessed 28 January 2021.

73 S Good, 'KOGAS Domestic Sales Hit Five-Year High' *Argus Media* (15 February 2021) <https://www.argusmedia.com/en/news/2187104-kogas-domestic-sales-hit-fiveyear-high> accessed 20 February 2021; S Kanoi and K Foo, 'Slim Pickings for Prompt LNG Cargoes to Meet Historic Feb Asia Demand' *S&P Global Platts* (Singapore, 12 January 2021) <https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/011221-slim-pickings-for-prompt-lng-cargoes-to-meet-historic-feb-asia-demand> accessed 20 February 2021.