Chapter 8

Strategy for Aligning COVID-19 Recovery and Stimulus Measures with Low-carbon Green Growth in the Republic of Korea

Jootae Kim and Sungjin Son

Chapter 8

Strategy for Aligning COVID-19 Recovery and Stimulus Measures with Low-carbon Green Growth in the Republic of Korea

Jootae Kim and Sungjin Son

Dankook University

Chapter 8: Strategy for Aligning COVID-19 Recovery and Stimulus Measures with Low-carbon Green Growth in the Republic of Korea

1. Introduction

The COVID-19 pandemic has been having an enormous impact on human life around the world. This paper focuses on the impact of the COVID-19 pandemic on the economic environment of the Republic of Korea (henceforth, Korea). Although the COVID-19 crisis is basically a health issue, it has brought limitations on transportation and industry output and these have caused an economic downturn. Governments have been trying various policies to prevent the negative impacts of the COVID-19 pandemic on national economies. We summarise how serious the spread of COVID-19 and the economic downturn have been in Korea and how the Korean government and Korean people are trying to minimise disastrous outcomes from the pandemic. The responses by the Korean government to the COVID-19 crisis consists of two steps, that is, a stimulus package in the short term and a green new deal in long term.

2. The COVID-19 Crisis in the Republic of Korea

In the first two months of the COVID-19 pandemic, Korea had the second-highest number of cases of any country, behind only China. Despite this initially high burden from the disease, Korea was able to dramatically lower the incidence of new cases and sustain a low mortality rate, making it a promising example of a strong national response. Importantly, Korea achieved this control and mortality rate with a relatively blunted economic impact given the extent of the outbreak when compared with other Asia-Pacific countries with a lower early COVID-19 burden.

We aim to describe the key elements of Korea's national response, focusing on measures that may have contributed to reducing the surge in incidence ('flattening the curve') and minimising economic collapse. The key features of the response to date have included specific strategies and strong national leadership and work to ensure an effective, coordinated and intersectoral response. The strategies have included the following (Oh et al., 2020):

- Early recognition of the threat and rapid activation of national response protocols led by national leadership;
- Rapid establishment of widespread diagnostic capacity;
- Scaling-up of measures for preventing community transmission, including contact tracing, quarantine, and isolation; and
- Redesigning the triage and treatment systems and mobilising the necessary resources for case management.

The successful response of Korea in early 2020 was characterised by the rapid implementation of widespread diagnostic tests for COVID-19. After the significant increase in confirmed cases in February was stabilised, the number of confirmed cases has been controlled successfully. Figure 8.1 shows the stabilised situation of the COVID-19 pandemic in the first half of 2020 in Korea. This success during the beginning stage of the pandemic made the test tools produced in Korea popular worldwide, and the tools were exported to many countries. Table 8.1 and Table 8.2 show that the confirmed cases in Korea have been relatively small compared with other major countries, even in 2021.

Figure 8.1 Cumulative Number of Deaths and Confirmed Cases in China, the Republic of Korea, Italy, Spain, and the United States
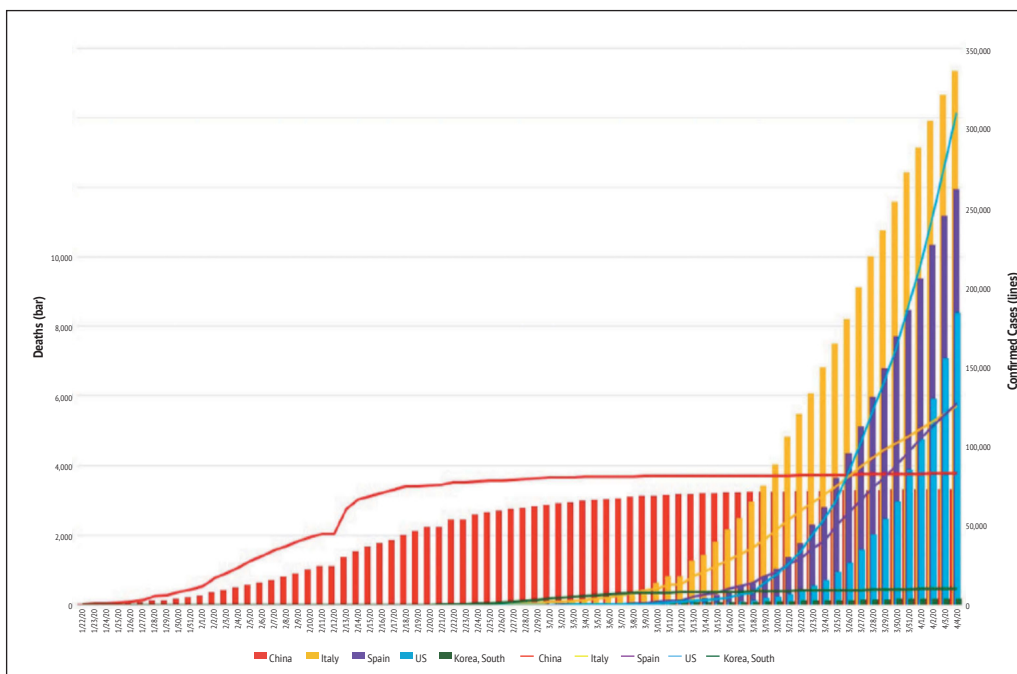
Source: Daily Reports. https://github.com/CSSEGISandData/COVID-19/tree/master/csse_covid_19_data
(accessed 6 April 2020).

Table 8.1 Comparison of Cumulative Cases Amongst Countries
(as of 10 January 2021)

Country	Cumulative cases
United States	22,137,931
India	10,450, 284
Brazil	8,075,998
Russia	3,344,175
United Kingdom	3,026,342
France	2,824,920
Turkey	2,317,118
Italy	2,257,866
Spain	2,050,360
Germany	1,928,462
Republic of Korea	68,864

Source: Johns Hopkins Covid-19 Resource Center (https://coronavirus.jhu.edu/).

**Table 8.2 Confirmed COVID-19 Case Distribution in the Republic of Korea
(as of 6 January 2021)**

	Number of cases	%
Number of cumulative tests	4,504,866	100
Cumulative negative test results	4,246,968	94.3
Testing in progress	192,082	4.3
Cumulative confirmed cases	65,816	1.9
Under isolation	17,794	
Deceased	1,027	
Imported cases	5,606	8.5

Source: Constructed using data from the Korea Control & Prevention Agency (kdca.go.kr/index.es?sid=a3).

As already explained, early diagnosis tests and effective social distancing have allowed the Korean government to take pride in its successful response to the COVID-19 pandemic. However, since December 2020, the dramatic increase in infection numbers and concerns about late vaccine supplies have caused many Korean people to criticise the government. Social distancing was tightened, and the government is trying to supply the vaccine as early as possible. The vaccine injections started in February 2021, and the medicines for COVID-19 developed in Korea are reported to be supplied in 2022, too. Figure 8.2 shows that the infection numbers in Korea increased greatly in December 2020.

Figure 8.2 Total Confirmed Cases of COVID-19 in the Republic of Korea
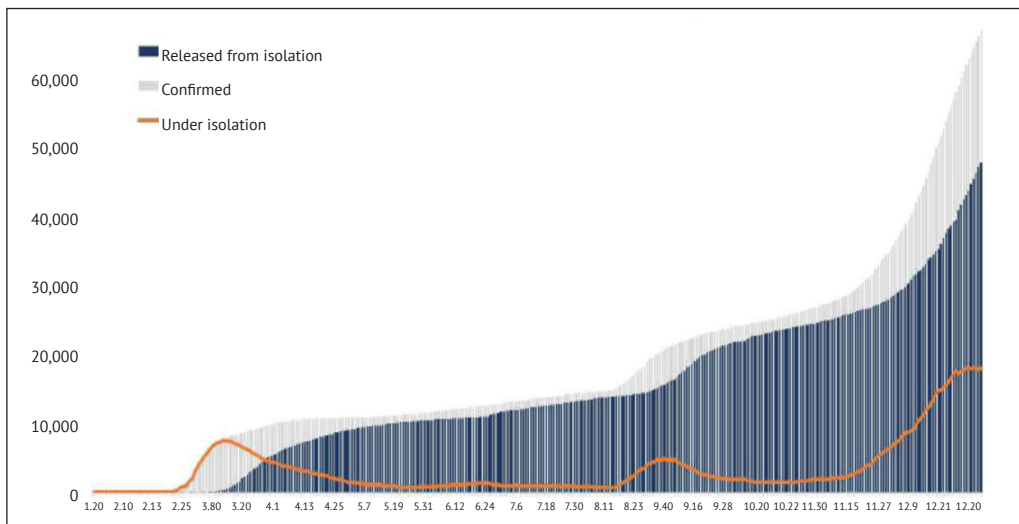
Source: Korea Disease Control and Prevention Agency (2021).

3. Economic Impact of COVID-19

The COVID-19 pandemic has had serious impacts on the economies of most countries. Many factories have been closed and the production output from factories has dropped. The decrease in production output has influenced the global production system. For example, in the early stage of the COVID-19 pandemic, the shutdown of manufacturing plants in China had serious impacts on the global value chains for most multinational companies. The most serious impact can be found in industries related to international travel. Many tourism agencies went bankrupt, and most international travel by aeroplane was banned. In Korea, two airline companies, Korean Air and Asiana Air, have faced significant drops in their sales and profits.The economic crisis As already explained, early diagnosis tests and effective social distancing have allowed the Korean government to take pride in its successful response to the COVID-19 pandemic. However, since December 2020, the dramatic increase in infection numbers and concerns about late vaccine supplies have caused many Korean people to criticise the government. Social distancing was tightened, and the government is trying to supply the vaccine as early as possible. The vaccine injections started in February 2021, and the medicines for COVID-19 developed in Korea are reported to be supplied in 2022, too. Figure 8.2 shows that the infection numbers in Korea increased greatly in December 2020. sides. Many industrial bases were shut down, so the production of many products fell. At the same time, the significant decrease in demand in several industries became a serious threat. The sharp drop in demand for airlines and foreign tours are typical examples. Third, less-competitive firms, especially small and medium-sized enterprises, have not had the capacity to survive this crisis. Sales decreases in these firms have caused cash shortages in their management, and this may lead to bankruptcy or bailouts from the government. In addition, the bad performance and increased debt for manufacturing companies can spread to the credit risk in financial institutions.

As result, the COVID-19 pandemic will decrease gross domestic product (GDP) and trade volumes in most countries. Tables 8.3 and 8.4 show the forecasts for GDP and trade volumes for major countries in 2020 and 2021. The international trade volume is predicted to drop more than 10%. From a conservative viewpoint, the forecasted drop in 2020 is about 30%. The figures around 2021 are quite positive. However, the report that made these forecasts was published in July 2020. From news reported on 28 September 2020 by Naver,[1] the largest internet portal in Korea, Bill Gates predicted that the vaccine would be supplied in summer 2021, and the pandemic would be over in early 2022. In this scenario, the economic downturn would continue even into 2021.

The economic growth rate of Korea in 2019 was about 2%, and the estimate for 2020 made in 2019 was also around 2%. After the outbreak of the COVID-19 pandemic, the growth estimate for 2020 was decreased to about -1%. This estimate was made in April 2020, and the estimate reported in September 2020 was also between -1.0 and -1.5%. Compared with Western countries, such as the United States and countries in the European Union, this figure is small. In these Western countries, the economic growth rates in 2020 are forecast to be larger than -5%. In preventing both the spread of COVID-19 and economic recession, Korea seems to be more successful than major Western countries.

[1] https://www.ilyosisa.co.kr/news/article.html?no=222012

Table 8.3 Expected Change in Trade Volume

	Past	Positive view		Conservative view	
	2019	2020	2021	2020	2021
Trade volume	-0.1%	-12.9%	21.3%	-31.9%	24.0%
Exports					
North America	1	-17.1	23.7	-40.9	19.3
South America	-2.2	-12.9	18.6	-31.3	14.3
Europe	0.1	-12.2	20.5	-32.8	22.7
Asia	0.9	-13.5	24.9	-36.2	36.1
Imports					
North America	-0.4	-14.5	27.3	-33.8	29.5
South America	-2.1	-22.2	23.2	-43.8	19.5
Europe	0.5	-10.3	19.5	-28.9	24.5
Asia	-0.6	-11.8	23.1	-31.5	25.1

Source: Samjung KPMG Economic Research Institute (https://home.kpmg/kr/ko/home/services/eri.html).

Table 8.4 GDP Forecast for Major Countries

(%)

	Growth rate	Revised forecast (Dec 2020)		Original forecast (Jan 2020)	
	2019	2020	2021	2020	2021
Rep. of Korea	2.0	-1.1	2.8	2.2	N/A
United States	2.3	-3.7	3.2	2.0	1.7
China	6.1	1.8	8.1	6.0	5.8
Japan	0.7	-5.3	2.3	0.7	0.5
Germany	0.6	-5.5	2.8	1.1	1.4
France	1.3	-9.1	6.0	1.3	1.3
United Kingdom	1.4	-11.2	4.2	1.4	1.5
Italy	0.3	-9.1	4.3	0.5	0.7
Spain	2.0	-11.6	5.0	1.6	1.6
India	4.2	-9.9	7.9	5.8	6.5

Source: Samjung KPMG Economic Research Institute (https://home.kpmg/kr/ko/home/services/ eri.html); OECD data (https://www.oecd.org/coronavirus/en).

4. Economic Recession and Stimulus Packages

The International Monetary Fund (IMF) predicted in June, 2020 that the world economic growth rate would be -4.9% in 2020. This figure was lower than the IMF's forecast in April 2020 of -3.0%. The Organisation for Economic Co-operation and Development (OECD) also reported in June,2020 that the growth rate of 2020 would be -6.0%. The world economic crisis coming from COVID-19 can be found in many areas (Health Focus News, 2020).

- The rapid decrease in consumption originates from closed borders and airports, limited mobility, closed schools, and reduced social credit.

- Consumption decreases and increased market uncertainty have made companies drop their investments.

- In many companies in which sales amount and profit levels have dropped, large layoffs have been made. Unemployment levels have become higher and governments have had to pay unemployment compensation.

- The size of trade in the world has dropped significantly, and exporting companies have faced challenging business environments.

The negative impact on the economy has been huge, as is the same in most countries. Interestingly, the impact of COVID-19 is different across industries. Some industries were severely threatened, and significant layoffs or no-payment breaks occurred in many corporations. In contrast, in some industries, sales increased significantly, and firms obtained remarkable performance. From a report by Hana Economic Research Institute (2020) in Korea, industries can be divided into four categories based on the impact from COVID-19.

Table 8.5 Impact of COVID-19 on Various Industries in the Republic of Korea

Impact	Industries
Large negative impact	Theatres, theme parks, duty-free stores, airlines, tour agencies, hotels
Small negative impact	Fitness centres, public saunas, karaoke, bars, department stores, large discount stores, wedding services, express buses, rail services
Small positive impact	Cosmetics, electric vehicle charge stations, furniture, interior, liquor stores, supermarkets (vegetables, meat, fish), bicycles
Large positive impact	Cable TV, online shopping and delivery services

Source: Hana Economic Research Institute (2020).

To respond to the world economic crisis, most countries supplied stimulus packages to support their firms, workers, and consumers facing financial difficulties. The stimulus packages comprise fiscal subsidies or liquidity support, such as tax reductions, loans from public banks, and credit guarantees. Table 8.6 shows how much major countries' carried out such financial support.

Table 8.6 Size of Stimulus Packages in Major Countries (support amount as a share of GDP)

	Fiscal subsidy	Liquidity support
United States	12.3%	2.6%
Japan	11.3%	24.05
Germany	9.4%	31.5%
Rep. of Korea	3.1%	9.7%

Source: Health Focus News (2020).

The average stimulus package ratios in G20 countries are 5.8% for fiscal subsidies and 6.4% for liquidity support.

Korea launched economic temporary stimulus packages to boost the domestic market and export industries amid the fallout of COVID-19. There were nine temporary stimulus packages as of 30 April 2020 (see Table 8.7). This package was the first attempt by the Korean government, and the second emergency relief grant was offered in early October. Whilst the first grant was made to all Korean people, the second grant was made only to vulnerable people. The third grant was offered in January 2021 and this grant was made to micro businesses that were seriously damaged by COVID-19. The fourth relief grant was paid in April 2021. Most of the government's plans were focused on injecting liquidity to stalled areas. Specifically, as for the domestic market, the government came up with extensive plans, such as temporary stimulus payments, temporary paid leave and family medical leave, temporary emergency welfare support, and temporary employment assistance funds, etc. to boost prepayments to help the people.

**Table 8.7 Emergency Relief Grants in the Republic of Korea (as of July 2020)**

Strategy	Content
Emergency	Plan to provide stimulus payment (cheque, cash, cash deposit to credit card) to all Korean people.
Stimulus cheque for small businesses with decreased sales	Plan to provide stimulus cheque to small business owners who had to reluctantly shut down due to the incidence of a confirmed COVID-19 case.
Paid leave and family medical leave subsidy	Plan to provide paid leave and family medical leave to workers who have family members infected by COVID-19.
Emergency welfare subsidy	Plan to provide emergency welfare support to households experiencing difficulty due to COVID-19.
Unemployment assistance fund	Plan to provide unemployment assistance fund for workers who, to maintain employment, reduce more than 20% of their total working hours or leave work for more than 1 month.
Paid leave and family medical leave for business owners	Plan to provide subsidy to business owners who provided paid leave and family medical leave to employees who have to care for their families due to COVID-19.
Living expenses subsidy for isolated patients	Plan to provide living expenses subsidy to confirmed quarantine patients not taking paid leave.
Subsidy for freelance workers	Plan to provide subsidy to freelance workers who lost their jobs due to COVID-19.
Living expenses subsidy for workers who are on unpaid leave	Plan to provide temporary living expenses subsidy to workers who are on unpaid leave due to COVID-19.

Source: Central Disaster Management Center, Republic of Korea (http://ncov.mohw.go.kr/en/).

One interesting question is how much the stimulus efforts in a country are related to green policy. From Vivid Economics (2020), Figure 8.3 shows how much stimulus programmes contributed to the greening of the economy. In this figure, the green bars represent positive contributions, and the red bars mean negative contributions. The green performance of stimulus programmes in Korea is relatively good.

Figure 8.3 Greenness of Stimulus Index
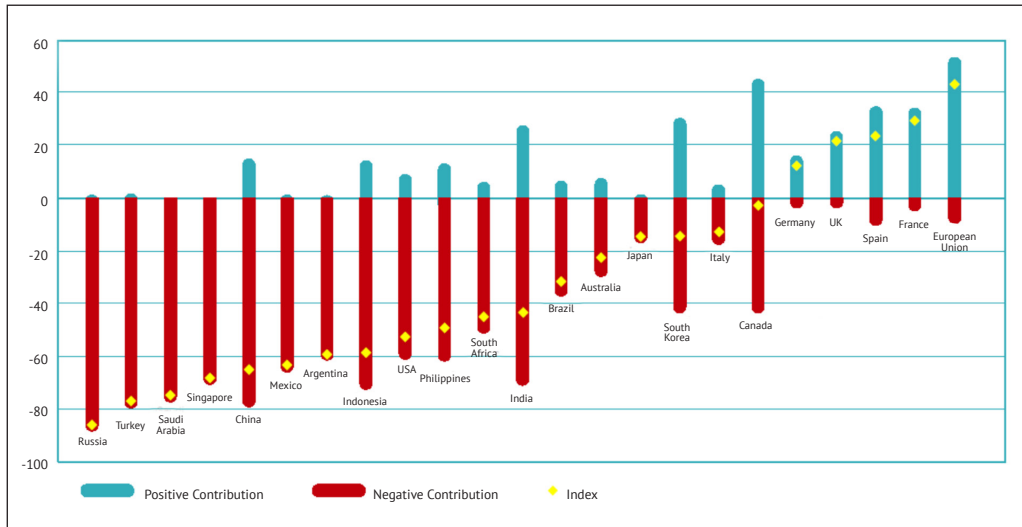
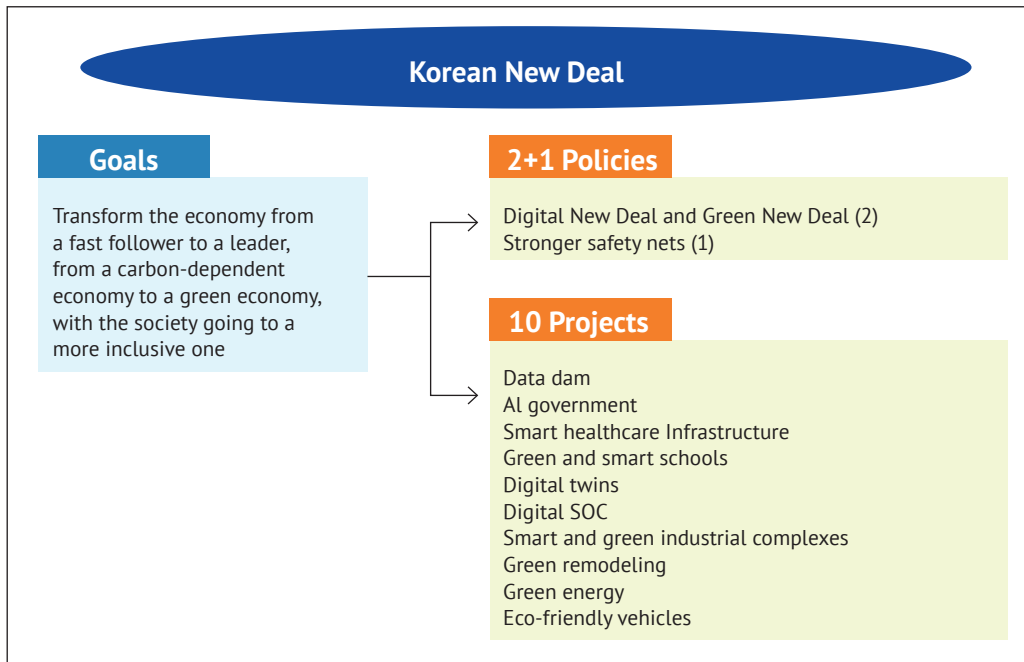Source: Vivid Economics (2020).

5. Green New Deal Initiative

Korea achieved high economic growth since it began its economic development in the 1960s. The country experienced a national crisis and economic downturn caused by the IMF financial crisis in 1997. The Korean economy entered the maturity stage after overcoming the IMF financial crisis through restructuring of the economy and the business system. After entering the maturity stage of the economy, the high growth rate trend stopped, and the social polarisation emerging from income inequality, real-estate fluctuations, and economic displacements started to become worse. Recently, Korea has been facing an economic downturn and employment instability due to the process of strict economic lockdown during the COVID-19 pandemic.

The pandemic has brought about changes in the overall economic and social structure, and the transition to online business models, digital transformation, and the green economy is being accelerated. It is generally agreed that the recovery programmes and economic reform plans adopted by the government will determine the status of the economy after the pandemic. As a plan to build the green economy, President Moon announced the Korean-style Green New Deal Initiative in July 2020. According to the announcement, the framework for the Korean Green New Deal can be illustrated as shown in Figure 8.4.

Figure 8.4 Framework for the Green New Deal in the Republic of Korea

Korean New Deal

Goals

Transform the economy from
a fast follower to a leader,
from a carbon-dependent
economy to a green economy,
with the society going to a
more inclusive one

2+1 Policies

Digital New Deal and Green New Deal (2)
Stronger safety nets (1)

10 Projects

Data dam
Al government
Smart healthcare Infrastructure
Green and smart schools
Digital twins
Digital SOC
Smart and green industrial complexes
Green remodeling
Green energy
Eco-friendly vehicles

Source: Ministry of Economy and Finance, Republic of Korea (2020).

The goal of the Korean-style New Deal is to transform the economy from a fast follower to a leader and from a carbon-dependent economy to a green economy, with a more inclusive society. The Korean New Deal includes '2+1 policies', and '10 major projects' out of a total of 28. The Government of Korea is actively going to implement 2+1 policies towards a digital and green economy (2), as well as strengthened social safety networks (1).

1) Major projects

The major projects are the three types of policy: Digital New Deal, Green New Deal, and stronger safety nets.

a. Digital New Deal

The Digital New Deal is about preparing for surging demand for remote services and paving the way to a digital economy, through which the economy will increase its dynamism. The Digital New Deal has six strategies as shown in Table 8.8.

Table 8.8 Implementing Strategies and Content for the Digital New Deal

Strategy	Content
Create industrial convergence with data, networks, and artificial intelligence (AI) across the economy	Make data open to the public and build big data platforms, promote 5G-AI industrial convergence, launch a smart government based on 5G and AI.
Make education infrastructure digital	Build digital learning infrastructure in primary and secondary schools, promote online classes for college education and job training.
Promote 'non-contact' industries	Build 18 smart hospitals to provide remote healthcare services, provide digital caring services for seniors and other vulnerable groups in terms of health, help SMEs jointly set up virtual conference rooms, and provide small businesses with support for online sales.
Make social infrastructure digital	Introduce digital management systems to the four major SOC areas of transportation, underground structures (digital twins), water management, and disaster response.
Make cities and industrial complexes digital	Build smart cities and smart industrial complexes.
Make logistics digital	Build smart logistics centres, including those near ports, and build online platforms for farm product transactions.

Source: Ministry of Economy and Finance, Republic of Korea (2020).

b. Green New Deal

The Green New Deal is about pursuing a low-carbon and eco-friendly economy, such as by building eco-friendly energy infrastructure, including a 'green energy dam', and working to make the country's eco-friendly industries the most competitive in the world market, such as eco-friendly vehicles, renewable energy generation, and other technologies. The Green New Deal has four strategies as shown in Table 8.9.

Table 8.9 Implementing Strategies and Content for the Digital New Deal

Strategy	Content
Pursue eco-friendly infrastructure and renewable energy production	Work to achieve the 2030 greenhouse gas emission reduction target and RE30203.*
Green transition of infrastructure	Remodel public buildings and schools.
Promote low-carbon and decentralised energy	Build smart grids and promote distributed energy production and eco-friendly vehicles.
Promote innovation in green industries	Provide technology development support for environment and energy SMEs, build a green industrial cluster to help with technology development, testing, production and marketing, and create about W215 billion worth of public-private joint funds to grow green businesses, as well as make W1.9 trillion worth of loans available for businesses investing in environmental protection tools and facilities.

* Initiative to reach 20% renewable energy production by 2030.
Source: Ministry of Economy and Finance, Republic of Korea (2020).

c. Stronger safety nets

Stronger safety nets are about reducing income inequality amongst workers, expanding social securities and job securities, and improving education and vocational training programs for a successful digital and green transition. Stronger safety nets have two strategies, as shown in Table 8.10.

Table 8.10 Implementing Strategies and Content for the Digital New Deal

Strategy	Content
Pursue eco-friendly infrastructure and renewable energy production	Invest in employment security and social security programmes to expand coverage.
Green transition of infrastructure	Increase investment in digital and green workforce training programmes, improve vocational training programmes to adequately equip trainees with skills for the future, and expand internet excess in rural areas.

Source: Ministry of Economy and Finance, Republic of Korea (2020).

2) Ten major projects

The government has chosen 10 major projects out of a total of 28 projects (12 for the Digital New Deal, 8 for the Green New Deal, and 8 for social safety nets) through close cooperation with the Office of the President and the private sector. The 10 tasks have been selected as those that will likely create new markets and more jobs and have a larger impact on the real economy (see Table 8.11). The Digital New Deal consists of three projects: a data dam, AI government, and smart healthcare infrastructure. Digital-green industrial convergence has four projects (green and smart schools, digital twins, digital SOC, and smart and green industrial complexes), and the Green New Deal has three projects (green remodelling, green energy, and eco-friendly vehicles).

Table 8.11 Ten Major Projects of the Korean New Deal

Digital New Deal	- Data dam - AI government - Smart healthcare infrastructure
Digital-green industrial convergence	- Green and smart schools - Digital twins - Digital SOC - Smart and green industrial complexes
Green New Deal	- Green remodelling - Green energy - Eco-friendly vehicles

Source: Ministry of Economy and Finance, Republic of Korea (2020).

3) Investment plans and major projects

Table 8.12 presents the investment plan for the 10 major projects. As shown in Table 8.12, by 2022, a total of W43.4 trillion (W29.5trillion from fiscal investment) will be spent on the 10 projects, and 516,000 jobs are expected to be created. By 2025, a total of W100.9 trillion (accumulative, W68.7 trillion from fiscal investment) will be spent and 1,111,000 jobs are expected to be created.

Table 8.11 Ten Major Projects of the Korean New Deal

Digital New Deal (3 projects)	Total investment (fiscal investment) trillion W		Jobs created (thousand)
	2020–2022	2020–2025	2020–2025
Data dam	8.5 (7.1)	18.1 (15.5)	389
AI government	2.5 (2.5)	9.7 (9.7)	91
Smart healthcare	0.1 (0.1)	0.2 (0.1)	2
Digital-Green Industrial Convergence (4 projects)	**Total investment (fiscal investment) trillion W**		**Jobs created (thousand)**
	2020–2022	2020–2025	2020–2025
Green and smart schools	5.3 (1.1)	15.3 (3.4)	124
Digital twins	0.5 (0.5)	1.8 (1.5)	16
Make SOC digital	8.2 (5.5)	14.8 (10.0)	143
Smart and green industrial complexes	2.1 (1.6)	4.0 (3.2)	33

Green New Deal (3 projects)	Total investment (fiscal investment) trillion W		Jobs created (thousand)
	2020–2022	2020–2025	2020–2025
Green remodelling	3.1 (1.8)	5.4 (3.0)	124
Green energy production	4.5 (3.7)	11.3 (9.2	38
Eco-friendly vehicles	8.6 (5.6)	20.3 (13.1)	151
Total (10 projects)	43.4 (29.5)	100.9 (68.7)	1,110

Source: Ministry of Economy and Finance, Republic of Korea (2020).

Specifically, first, for the data dam, the government will invest a total of W8.5 trillion (W7.1 trillion from fiscal investment) by 2022 and 207,000 jobs are expected to be created. By 2025, a total of W18.1 trillion (W15.5 trillion from fiscal investment) will be invested and 389,000 jobs will be created. Second, for the AI government, the government will invest W2.5 trillion by 2022, with as many as 23,000 jobs expected to be created, and W9.7 trillion by 2025, with 91,000 jobs expected to be created. Third, for smart healthcare, a total of W0.1 trillion (W0.1 trillion from fiscal investment) will be invested by 2022, creating 1,000 jobs, and by 2025, a total of W0.2 trillion (W0.1 trillion from fiscal investment) will be invested, creating 2,000 jobs. Fourthly, for green and smart schools, a total of W5.3 trillion (W1.1 trillion from fiscal investment) will be invested by 2022, creating 42,000 jobs, and by 2025 a total of W15.3 trillion (W3.4 trillion from fiscal investment) will be invested, creating 124,000 jobs. Fifth, for digital twins, the government will invest W0.5 trillion by 2022 and 5,000 jobs are expected to be created, and a total of W1.8 trillion (W1.5 trillion from fiscal investment) will be invested by 2025, creating

16,000 jobs. Sixth, for the digital SOC, a total of W8.2 trillion (W5.5 trillion from fiscal investment) will be invested by 2022, creating 73,000 jobs, and by 2025 a total of W14.8 trillion (W10.0 trillion from fiscal investment) will be invested, creating 143,000 jobs. Seventh, for smart and green industrial complexes, a total of W2.1 trillion (W1.6 trillion from fiscal investment) will be invested, creating 17,000 jobs, and by 2025, a total of W4.0 trillion (W3.2 trillion from fiscal investment) will be invested, creating 33,000 jobs. Eighth, for green remodelling, a total of W3.1 trillion will be invested (W1.8 trillion from fiscal investment) by 2022, creating 78,000 jobs, and by 2025 a total of W5.4 trillion (W3.0 trillion from fiscal investment) will be invested, creating 124,000 jobs. Ninth, for green energy, a total of W4.5 trillion (W3.7 trillion from fiscal investment) will be invested by 2022, creating 16,000 jobs, and by 2025, a total of W11.3 trillion (W9.2 trillion from fiscal investment) will be invested, creating 38,000 jobs. Tenth, for eco-friendly mobility of the future, a total of W8.6 trillion (W5.6 trillion from fiscal investment) will be invested by 2022, creating 52,000 jobs, and by 2025, a total of W20.3 trillion (W13.1 trillion from fiscal investment) will be invested, creating 151,000 jobs.

4) Expected outcomes

The goal of the Korean government is to build a smart country, a green country, and a safe country with these investments.

First, the government expects that smart industries, a smart government, and smart cities will be built through the investments for a smart country. Specifically, for smart industries, a total of W43 trillion worth of data markets are expected to be created, and 18 smart hospitals will be in service with up to 40% of work done remotely. For the smart government, 80% of public services will become digital, and the government will use cloud computing by 100%. And for smart cities, there will be high-precision road maps for most of the roads across the country, and 108 smart city management platforms will be set up.

Second, the government expects that the three targets of protecting environment, introducing low-carbon green energy, and developing green industries will be achieved through investments for a green country. Specifically, for a clean environment, as many as 225,000 public rental houses will be remodelled to be energy-efficient and eco-friendly houses, whilst 25 cities will be transformed to become smart and eco-friendly ones, and 723 hectares of urban forests will be set up to reduce fine dusts. To 'use low-carbon green energy', there will be 1,130,000 electric cars and 200,000 hydrogen fuel cell cars running across the country, renewable energy production capacities will reach 42.7 gigawatts, and 5,000,000 households will get electricity through smart grids. For

green industries, about 1,750 factories will be transformed into clean factories, fine dust reduction systems will be installed in 13,182 small manufacturers, and 10 smart energy platforms will be built.

Third, the government expects that an income guarantee, human resources, and digital inclusion will be achieved through the investments for a safe country. Specifically, for the income guarantee, about 21 million workers will be covered by 'employment insurance' programmes, and 1.13 million households will be made eligible for social security benefits. For human resources, there will be 100,000 high-tech workers available for the artificial intelligence and software sectors and 20,000 high-tech workers for green industrial convergence. For digital inclusion, internet access will be made available to all rural areas of the country, and 70% of people aged over 70 will be able to enjoy mobile internet access.

6. Policy Recommendations

From the experiences of Korea explained above, the following policy recommendations can be made. First, the role of digital technology is critical. Greenness and sustainability is a huge trend in the world society, and one way for 'building back better' after the COVID-19 pandemic is to pursue the green economy and sustainable development. Another mega trend in the world is digital transformation. These two trends can affect each other. In the process of greening industries and organisations, digital technologies can be effectively used.

Second, the clear and consistent policy of governments is necessary. For the success of any social change, the vision of the leader should be offered effectively. In Korea, different presidents have tended to present different visions and policies. Under President Lee from 2008 to 2012, green growth policy was stressed as a vision of the Korean economy, but the next President Park did not pay attention to green policy. The current President Moon declared the Green New Deal again. There is a possibility that the next president, whose term will begin in 2022, may change the national policy again.

Third, policies and programmes for a low-carbon economy should be localised. The European Union seems to be the most advanced in green movements, and most developing countries tend to imitate the programmes created in developed countries. This attitude can give a signal effect to the outside stakeholders, but real transformation may not be expected. ASEAN countries have different environments for politics and the economy from the European Union and the United States. The green policies and programmes created in the European Union or the United States cannot be applied directly to ASEAN.

Fourth, regional or international cooperation is helpful for greening ASEAN economies. One possible form of cooperation is technology transfer amongst countries. Various technologies are necessary for the development of green industries and green organisations, and these technologies should be imported from advanced economies. Investments from global corporations can provide technology and capital that can be used as inputs for the development of green economies in ASEAN. Technology transfer can also be made in the public sector.

REFERENCES

Hana Economic Research Institute (2020), Impact of Covid-19 on Consumer Behaviors. Seoul. http://www.hanaif.re.kr/boardList. do?menuId=MN2200&tabMenuId=N

Health Focus News (2020). Health Focus, 20 July. http://www.healthfocus. co.kr/#link5

Ilyosisa (Korean newspaper), Forecast about Covid-19, 28 September 2020.

Johns Hopkins COVID-19 Resource Center, COVID-19 Dashboard. Johns Hopkins COVID-19 Resource Center. https://coronavirus.jhu.edu/map. html (accessed 10 January 2021).

Korea Disease Control and Prevention Agency (2021), Updates on Covid-19 in Republic of Korea, 7 January, Seoul.

Ministry of Economy and Finance (2020), *Government Announcement about the Overview of Korean New Deal*, Republic of Korea, Seoul.

Oh, J., J.-K. Lee, D. Schwarz, H.L. Ratcliffe, J.F. Markuns, and L.R. Hirschhorn (2020), 'National Response to COVID-19 in the Republic of Korea and Lessons Learned for Other Countries', *Health Systems & Reform*, 6(1), e1753464.

Samjung KPMG (2020), COVID-19 Business Report, July. Seoul.

Vivid Economics (2020), Greenness of Stimulus Index. https://www. vivideconomics.com/wp-content/uploads/2021/01/201214-GSI-report_ December-release.pdf (accessed 10 January 2021).