



The 7th International Conference
on the Economics of Happiness
Jeonju

The 7th International Conference on the Economics of Happiness Jeonju

Climate Crisis and Localization

기후위기와 지역화

09:00~18:40, **October 21**, 2021 (Thu.)

You Tube LIVE

Economics of Happiness Jeonju
행복의 경제학 국제회의 전주



Local Futures



전국 사회연대경제 지방정부협의회



행복실현지방정부협의회

제7회 행복의 경제학 국제회의 전주 조직위원회



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Programs

Time		Program		
		Details	Theme	Participants
08:50~09:00	10'	Registration		
09:00~09:40	40'	Opening and welcome speech		
09:40~10:10	30'	Keynote speech 1		
10:10~10:30	20'	Keynote speech 2		
10:30~10:40	10'	Break time		
10:40~12:40	120'	Session 1	Response to the climate crisis, Local citizens' food practice	MODERATOR Han Dong-soong Jeonju University Professorfdg SPEAKERS Andre Leu Australia Regeneration International Director Lee Geun-haeng Korean Institute for the Study of Rural Societies Former Director PANELISTS Yang Byung-wook Jeonju Urban Agricultural Research Association Chairperson Bae Bok-ju Jeonju iCOOP Consumer Life Cooperative Chairperson Yang Jun-hwa Local Sustainability Alliance of Korea Secretary-general Lee Chang-han Regional Foundation Project Director
12:40~14:00	80'	Lunch		
14:00~16:00	120'	Session 2	Measures to revitalize Green Climate Finance in Jeonju	MODERATOR Son Hyun-joo Jeonbuk National University Professor SPEAKERS Andrew Simms Sussex University Researcher Lee Jong-oh Korea Sustainability Investing Forum Secretary-general PANELISTS: Yoon Deok-chan Who's Good CEO Lee Jung-hyun Korean Federation for Environmental Movement Vice President No Eun-young Jeonju City Department of Future Strategy Innovation Director
16:00~16:10	10'	Break time		
16:10~18:10	120'	Session 3	Job policy in response to the climate crisis	MODERATOR Heo Moon-kyung Jeonju University Professor SPEAKER Jason Hickel London School of Economics and Political Science International Institute of Inequality Senior Researcher Oh Ki-chul Green Asia Network Executive Director Lee Yu-jin Institute for Green Tranformation vice director Bae Kiu-sik secretary general & permanent member of Economic, Social and Labor Council Seo Nan-yeo Jeonju City Councilor
18:10~18:40	30'	Keynote speech 3 Closing		
		Helena Norberg-Hodge Local Futures Director		

Major Figures



Alf Hornborg
Sweden

- Professor of human ecology, Lund university
- Research on the cultural and political dimensions of human–environmental relations in the past and present society
- Work : 'The power of machines', 'Global ecological and inequality exchanges', 'The nature, society, and justice of the global magic human race'



Kim Mi-ok
Korea

- Professor of social welfare, Jeonbuk national university
- The Korean academy of disability and welfare president, Member of the welfare's disabled policy coordination committee and the disabled system coordination committee at the ministry of health and welfare, Human rights education expert committee member at national human rights commission of Korea



Andre Leu
Australia

- Regeneration international director
- Lecture activities on the multifunctional benefits of renewable organic farming to the government, industry, farmers, consumers and NGOs
- Work : 'Poisoning our children', 'The myth of safe pesticides'



Andrew Simms
UK

- Researcher at the global center for political economy, Sussex university
- Co-founder of the New Weather Institute, Developer of climate change, energy and interdependence programs
- Work : 'The new economy', 'Ecological debt'



Jason Hickel
UK

- Senior researcher of international institute of inequality, London school of economics and political science
- UN Human development report statistical advisor, Green new deal for Europe advisor, Working for the Harvard–Lancet indemnity and redistribution justice committee
- Work : 'Divide' , 'Less is More'



Helena Norberg-Hodge
Australia

- Local Futures Founder and Director
- Pioneer in Local activities around the world, Winner of the Right Livelihood Award(Alternative Nobel Prize) and Goi Peace Prize
- Work : 'Ancient Futures : Learning from Ladakh'

Korean Major Figures



Kim Seung-soo
Mayor of Jeonju City

As the incumbent seventh Mayor of Jeonju City elected by popular vote, Mayor Kim pays close attention to people, culture, and the ecosystem that determines the city's identity. He also studies changes in the urban development paradigm, to usher in a brilliant period of prosperity for Jeonju, along with Jeonju citizens for a better world. He promotes the old city center village regeneration and the Jeonju Food Plan, and endeavors to launch Jeonju as a social and economic leader through sustainable growth support of social and economic organizations, and job creation. In addition to co-chairing the Governors Club, a gathering of seven local government heads elected by popular vote, Mayor Kim is the vice chairman of the National Large City Mayors Council and chairman of the Happiness Realization Local Government Council for 2018. Through these roles, he is building solidarity and a cooperative system with other local governments. Mayor Kim is working hard to make Jeonju the Happy City, where citizens look forward to a brighter tomorrow with passion and devotion.



Kang Dong-hwa
Chairman of Jeonju City Council

He is in charge of Leader of the 11th Council of Jeonju City. Under the banner of "Jeonju City Council with Citizens," he is making efforts to establish a communication-oriented parliament that always listens to citizens' voices and reflects them on the agenda, and to play a strong fence for the correct parliamentary activities of Jeonju City Council members. He is also the chairman of the council representing the council of city and county councils in North Jeolla Province, exploring policies for the happy lives of residents in close cooperation with other city and county councils and laying a solid foundation for the establishment of complete local autonomy. He is doing his best to become a wheat grain for the development of Jeonju with the mindset of the every step forward in accordance with the wishes of the citizens.



Moon Seok-jin
Chairperson of Association of Korean
Local Governments for Social Economy
and Solidarity

From the 5th to the 7th election, he is the head of Seodaemun-gu, Seoul. In order to move toward a "people-centered future," policies for local residents are prioritized in education, culture, welfare, and the environment. And also embodies a city where local residents and nature, history, and future coexist. Currently, he is the chairman of the National Social Solidarity Economic Local Government Council and is working with solidarity of basic local governments across the country to achieve social innovation through revitalizing the local social economy. He served as a standing representative of the Mokmin-gwan Club and chairman of the National Council of Lifelong Learning Cities, and is also a certified public accountant. His main book is "Seodaemun Daddy Long Legs' Happiness Companion".



Kim Young-jong
Chairperson of Local Government
Association for GNH

From the 5th to the 7th election, he is the head of Jongno-gu, Seoul. Jongno-gu embodies warm welfare, dream education, participating autonomy, fair integrity, lively culture, and safe health city for "sustainable luxury city, healthy Jongno," and is the nation's No.1 happy city. Currently, as the chairman of the Local Government Association for GNH, he is contributing to solidarity and cooperation with local governments to create a community where everyone is happy. He serves as a standing representative of the Mokmin-gwan Club, chairman of the Korea Healthy Cities Council, chairman of the Seoul Metropolitan Government Council, and chairman of the Local Government Council for Sustainable Development, and is an adjunct professor at Hanyang University's Graduate School of Public Policy (Administrative Autonomy).

Session 1 attendees



Lee Geun-haeng

Session 1 Speaker

He is interested in people, regions, and the environment, and has been researching at the Korea Federation of Environmental Movement, the Korea Urban Research Institute, the Ecological Community Movement Center, and the Mosim and Salim Policy Research Institute. He wrote a master's thesis on the theme of community movement at the Graduate School of NGOs at SungKongHoe University. His interest in the environment and community has led to agriculture and food, and he is currently working at the Korean Institute for the Study of Rural Societies after passing through the Hansalim Producer Association, striving to regenerate and expand agriculture in rural areas. In particular, he considers the climate crisis as an opportunity to transform the food system in our society.



Yang Byung-wook

Session 1 Panel

He was an office worker, but since returning to the village in the early 2000s, he has been living as an urban farmer who cultivated a garden. He encountered urban agriculture in 2017 and began related activities. He was the chairman of the Jeonju Urban Agricultural Research Association from 2019 to early 2021. Currently, he is attending the 'Urban Agricultural Curriculum' of the Jeonju Agricultural Technology Center as an instructor, and is conducting educational activities for participants in courses such as 'Citizen Garden' and 'Local Community Garden.'



Bae Bok-ju

Session 1 Panel

She is the chairman of the Jeonju ICOOP Living Cooperative, which is engaged in various activities such as distribution of eco-friendly organic products, waste reduction, and recycling of resources for the organic cycle of the Earth, society, and individuals. As chairman of the Committee for Consumer Activities to Save the Earth, which is dying of the climate crisis, she conducted various activities to introduce a 'consumption deadline labeling system' that can minimize food waste thrown away in the distribution process.



Yang Jun-hwa

Session 1 Panel

He was secretary-general of the Jeollabuk-do Council for Sustainable Development, a public-private cooperation organization for sustainable development, and is now secretary-general of the Local Sustainability Alliance of Korea. He also serves as a member of the National Network for Regional Energy Conversion, the Solar League Promotion Committee, the Promotion Committee of the RE100 Citizens' Club Promotion Team, and vice chairman of the UNESCO ESD Korea Committee. He is striving to create a sustainable local community by overcoming the climate crisis through regional application and energy conversion of SDGs.



Lee Chang-han

Session 1 Panel

After graduating from Konkuk University's Department of Agricultural Engineering, he completed a master's degree in agricultural economics at Chung-Ang University and a doctorate in agricultural and food economics at Konkuk University. He served as an aide to National Assembly member Kang Ki-gap, policy chairman of the National Farmers' Association Federation, head of the Root Center of the Hope Institute, and director of the Regional Foundation, and is currently an adjunct professor at Konkuk University's Link+ project group. He is striving to strengthen the capacity of local leaders and networking, research on the role of social economy organizations, food plans, etc. to revitalize rural areas.

Session 2 attendees



Lee Jong-oh
Session 2 Speaker

He has been serving as secretary-general of the 'Korea Sustainability Investing Forum' established in 2007 to contribute to the construction of a sustainable public body through social responsibility investment, and is striving to spread ESG (environmental, social, and governance) to Korean society. He focused on improving laws and systems related to ESG and developing policies. He thought 'finance' was the key to solving the problem of climate change, and actively developed the de-coal financial movement. In addition, he first proposed a 'de-coal safe' policy and spread it to local governments and education offices nationwide. He is currently working as a member of the Korea Beyond Coal Steering Committee and the Renewable Energy Utilization Deliberation Committee.



Yoon Deok-chan
Session 2 Panel

He completed a master's degree in international environmental law and a doctorate in international economic law at Kyung Hee University. As a researcher at the Korea Environment Institute, the Korea Environmental Industry & Technology Institute, and the Ministry of Commerce, Industry and Energy, he conducted various studies and served as the head of the research consulting center at the LG Environmental Research Institute. He established the Sustainable Power Plant, an artificial intelligence-based ESG analysis company, in 2013 and serves as a representative, and has ESG evaluation information and Who's Good, a U.S. subsidiary. He is informing that only companies that strive to have the business competitiveness required by the new economic system in the future can survive.



Lee Jung-hyun
Session 2 Panel

For more than 20 years, he has been active in preserving the natural environment in Jeollabuk-do and protecting the environmental rights of the socially disadvantaged. Based on his experiences and examples of local environmental movements such as anti-Buan nuclear waste site and saving Saemangeum mudflats, he served as chairman of the Jeonbuk Citizens' Association's steering committee, vice president of the Environmental Movement Association, and co-representative of the Energy Citizens' Solidarity. He received a presidential commendation for delivering the preservation of endangered species such as narrow-mouthed and thorny lotus, local environmental issues, and ecological resources to people through the media. He is currently a senior activist of the Jeonbuk Environmental Movement Federation, and chairman of Environmental Movement Federation and is a member of the Yeongsangang Seomjingang River Basin Management Committee, Education Environment Protection Committee, Jeollabuk-do Human Rights Committee, Jeonju City Park Committee, Environmental Impact Assessment Advisory, and Forest Service Advisory.



Noh Eun-young
Session 2 Panel

She is the manager of Jeonju City's Future Strategy Innovation Division, and is in charge of developing policies, establishing networks such as local universities, ESG, and innovative cities, and discovering projects. She was the head of the national budget promotion team in Jeonju City and has been mainly in charge of securing the national budget. The Future Strategy Innovation Department is a place to discover new projects to secure the national budget and cooperative projects that can coexist with local universities and innovative cities. It is also planning, developing, and operating projects to make Jeonju a sustainable city, such as ESG cooperation projects and support from the Sustainable Development Council.

Session 3 attendees



Oh Ki-chul

Session 3 Speaker

He is a climate response field activist. Since 1998, he has established 'Blue Asia', a climate response NGO, with climate activists from five Northeast Asian countries. For 23 years, he planted trees on 1,500 soccer fields (1050ha, 3.15 million pyeong). Mongolia, which is vulnerable to the climate crisis, fosters 200 Mongolian residents every year to implement an ecological restoration system for village communities affected by the climate. For these achievements, he won the "Land of Life" award awarded by UNCCD in June 2014, and has been developing models with residents in dry areas in central Myanmar, which has been affected by the climate crisis since 2013. He is currently developing a success model for climate damage communities applicable to Korea.



Lee Yu-jin

Session 3 Speaker

She works for energy decentralization and regional energy conversion for autonomy, and is co-representative of the 'National Network for Regional Energy Conversion.' She is studying the Green New Deal, a decarbonization economic transformation policy aimed at resolving the climate crisis and inequality, and served as the Green New Deal Special Advisor set by the Prime Minister. He is currently a member of the Presidential Carbon Neutral Committee. She worked for the Green Federation of Environmental Organizations from 1999 to 2012 and served as co-chairman of the Green Party. She received a master's degree in public policy from the KDI Graduate School of International Policy and a doctorate degree from the Graduate School of Environment at Seoul National University for a paper on the conversion experiment of Seongdaegol Energy Independent Village. Her main books include 'Neighborhood Energy is Hope,' 'Cultivating the Sun and Wind,' 'Story of Climate Change,' and 'Transition City.'



Bae Kiu-sik

Session 3 Speaker

He is an expert in employment and labor in Korea. He graduated from Seoul National University's Department of Electrical Engineering and obtained a master's degree in labor-management relations and a doctorate in industrial management from Warwick University in the UK. He served as a researcher at the Korea Labor Institute, a member of the Presidential Job Committee, and the Employment Policy Council of the Ministry of Employment and Labor, emphasizing the role of the state in solving labor problems and insisting on the need for social dialogue. As a standing member of the Presidential Committee on Economic, Social and Labor, he is currently striving to solve tasks such as hiring young people and resolving polarization. In addition, as a general advisor to Jeonju City's labor policy, he gives generous advice and suggestions to Jeonju City's labor policy.



Seo Nan-ye

Session 3 Speaker

She served as chairman of the Welfare and Environment Committee in the second half of the 11th Jeonju City Council. She is striving to create a safe environment, create a foundation for self-reliance of low-income families, and realize a healthy life to create Jeonju, a city of dreams and hopes. She proposed that Jeonju City Youth Ordinance should be established to invest in people through youth job programs, and is taking the lead in preparing a system for young people's start-ups and employment support. She is currently a member of the Youth Future Association of the Deobooleoh Democratic Party, a member of the National Balanced Development Committee of the Deobooleoh Democratic Party, and a steering committee of the Jeonbuk Environmental Movement Association.

Organizing Committee of the International Conference



Oh Chang-hwan
Chair

Chair Oh obtained doctor's degree from Stanford University in earth environment science. He is professor at Jeonbuk National University. He led environmental movement by presenting arbitrary measures for the co-existence of environment and local development to address social conflicts over Saemangeum development project. Chair Oh is currently serving as co-chair of Jeonbuk Environment Movement Association. He is also president of Jeonju Sustainable Development Council, playing a key role in creating one of the best-organized public-private cooperative networks in Korea as he has worked for the Council for 15 years.



Heo Moon-gyeong
Planning and Steering
Committee Chair

The one who dreams of a world for all, Chair Heo was once a member at the President's Committee on Policy Planning and is currently research professor at Jeonju University studying sustainable development and social and economic issues. Chair Heo finds it rewarding to discuss policy cases and apply the results to actual practices. Ever since she invited Helena Norberg-Hodge to Jeonju, she has committed herself to the success of the international conference on economics of happiness.



Ko Eun-ha
Committee member

Head of Jeonju Rehabilitation Center. She dreams of a welfare world where she can help neighbors with her talents and capability. She works to create a social corporate complex based on labor-integrated social companies through Jeonju Social Economic Network and to spread the values of sharing. She also served as steering committee member of Jeonbuk Cooperative Society Solidarity Council and director at Jeonbuk Medical Social Co-op.



Son Hyun-joo
Committee member

Academic research professor at Jeonbuk National University and editor-in-chief for Korea Association for Future Studies. He obtained doctor's degree in future sciences from University of Hawaii after studying political sciences. He studies alternative future and viable utopia for Korea. He is interested in New Economy Movement where people, values, and community can thrive on data society based on hyper-connectedness. He hopes to create a society where humans and robots can co-exist.



Lee Jae-min
Committee member

Lee Jae-min is economics professor at Jeonju National University. Lee is policy member for Jeonbuk Social Economy Solidarity Council and a member of "Together Jeonbuk Local Development Co-op." Lee claims that market's dominant roles, barter system, and principles of exchange in the capitalism economy have fundamental significance. While stressing that in the same way that reciprocity, re-distribution, and family economy do not rule society but emerge in the very society, the principles of barter hold subject position in a society where other principles take precedence, he sheds lights on direction and alternatives on new economics (altruistic economics).

Organizing Committee of the International Conference



Jeong Su-gyeong
Committee member

A researcher who studies how to make cities happy, urban regeneration, social innovation, and placeness. She also runs an urban base camp, a shared space for small companies, freelancers, individuals, and non-profit organizations. She hopes that Jeonju becomes an even happier city through the cooperation in the shared space.



Han Dong-soong
Committee member

Han Dong-soong graduated from Seoul National University's mathematics department and earned master's and doctor's degree in mathematics from the same university. Han is currently professor and Jeonju University. He is also dean of Jeonju University Future Convergence College, Jeonju University Cultural Industry Research Institute director, Local Innovation Center director, Jeonbuk ICT development council steering committee member, Korea Cultural Content Technology Society president. Han won 'Paper of the Year Award 2017' for his study titled 'Age of 4th IR: College Education and Contents' which presented methodology for higher education using state-of-the-art 4th IR technology. He commits to studying how to transfer knowledge through humanities values and new technology.



Kim Joong-gi
Committee member

Associate Professor at Jeonbuk National University Agricultural Economy and Distribution Department. As the general advisor for agricultural affairs of Jeonju city, Kim Joong-gi works to create the policy system for virtuous circle of local foods. After obtaining doctor's degree in Kyushu University, he managed administrative affairs for Jeollabukdo Province for 15 years, gaining experience in local agricultural affairs planning and implementation. He developed interest in creating communities and improving quality of life for people. Having served as director at 'Together Jeonbuk Local Development Co-op', he contributes to promoting economic solidarity between local communities.



Kim A-young
Committee member

A researcher who practices how to make a better future with neighbors and nature. As a member of Jeonju Consumer Living Co-op, she helped ordinary citizens make changes in everyday life. She is currently representative of 'Consumers Garden for Participation and Action' for citizens who participate in production and consumption. She is research professor at Sungkonghoe University Graduate School of Co-op Management, teaching and studying topics on co-op, social economics strategy, governance, and HR development.

Prospectus

The Prospectus of the 7th International Conference on the Economics of Happiness Jeonju

In order to find a way to create a community where everyone is happy through localization of the economy beyond competition and polarization, Jeonju has jointly organized the 「International Conference on the Economics of Happiness」 with Local Futures, the Association of Korean Local Governments for Social Economy and Solidarity, and the Local Government Association for GNH. This year marks the 7th conference in Jeonju and the 26th International Conference on the Economics of Happiness held by Local Futures in 8 countries around the world.

This year, under the theme of "Climate Crisis and Localization," there will be discussions on local food, climate finance, and jobs in response to the polarization of the economy and environmental degradation which is accelerated by the climate crisis.

The international community agreed on a fair transition that socially embraces the climate-vulnerable class including the unemployed, which may be threatened in the process of becoming a low-carbon society. Korean government established the national climate change adaptation measures in accordance with the Framework Act on Low Carbon, Green Growth which are in the early stages of implementation. In this situation, Jeonju is actively participating in the local governments' solidarity for carbon neutrality, and seeking public-private cooperation for ESG. To achieve both local sustainable development and carbon neutrality, the city would like to encourage the establishment of climate policy and climate action.

In Keynote Speech 1, Alf Hornborg, Professor at Lund University in Sweden, presents a way to tackle climate change at the cultural and political level for humans and the environment. In Keynote Speech 2, Miok Kim, Professor at Chonbuk National University suggests "Jeonju's Happiness Policy" based on Jeonju Citizen's Happiness Survey and Jeonju Happiness Index.

In Session 1, with the topic of "food practice of local citizens in response to climate crisis," Andre Leu, International Director of Regeneration International from Australia, and Geun-haeng Lee, Director of the Korea Farming and Fishing Community Research Institute discuss the urgent need for a shift away from the global agri-food system that relies on oil to eco-friendly and organic agriculture. The speakers insist that both producers and consumers act as joint problem-solver of the agri-food system and the climate crisis, and that producers and consumers work together for social transformation.

In the Session 2, with the topic of "measures to revitalize green climate finance in Jeonju," Andrew Simms, a researcher at the Centre for Global Political Economy at the University of Sussex, UK, and Jong-oh Lee, executive director of the Korea Sustainability Investing Forum, present green finance cases of Jeonju and London, the center of the world's finance. Based on the importance of cultural and regulatory changes to break the carbon chain of the climate crisis and introduce green finance and climate finance, they present the direction of green finance for Jeonju.

In Session 3, Jason Hickel, Senior Fellow at the International Inequalities Institute at the London School of Economics, Ki-Chul Oh, Executive Director of Green Asia, Yu-Jin Lee, Vice President of Institute of Green Transition, Gyu-sik Bae, Standing Member of the Presidential advisory body Social and Labor Council, Nan-yi Seo, the Chair of Jeonju City Council Welfare and Environment Council present on "employment policies in response to the climate crisis." They examine global trends and central government policies, and propose that the government and civic community should respond to the climate crisis by setting common goals. They also argue that we should have the right to make decisions about our own future as stakeholders for solving the climate problem.

For the Closing Speech, Helena Norberg-Hodge, the founder and director of Local Futures, present her vision for the future based on her experience over the past 50 years as the first generation of the environmental movement. She notes that COVID-19 and the climate crisis have exposed the flaws of the global economic system and provided a clear opportunity for the transition to a local community-based economy and emphasizes to complement strategies for broader and holistic perception shifts and systematic localization.

The event will be held by video conferencing due to the spread of contactless culture.

We hope that participants who aspire to a happy community will come up with a way to lead a safe and happy life from the climate crisis with 「The 7th International Conference on the Economics of Happiness in Jeonju」.

The Organizing Committee

The 7th International Conference of the Economics of Happiness Jeonju

CHAPTER 1

OPENING SESSION

Opening session

■ Opening address

| **Oh Chang-hwan**, Chairperson of the Organizing Committee for the 7th International Conference on the Economics of Happiness Jeonju

■ Welcoming speech

| **Kim Seung-su**, Mayor of Jeonju City

■ Congratulatory address

| **Kang Dong-hwa**, Leader of Jeonju City Council

■ Congratulatory address

| **Moon Seok-jin**, Chairperson of Association of Korean Local Governments for Social Economy and Solidarity

■ Congratulatory address

| **Kim Young-jong**, Chairperson of Local Government Association for GNH

Opening speech



Oh Chang Hwan

The Chairman of the
Economics of Happiness
Secretariat

Welcome to the 7th International Conference on the Economics of Happiness Jeonju. I would like to express my sincere gratitude to the speakers and participants at home and abroad. The subtitle of the 7th International Conference on the Economics of Happiness Jeonju is the Climate Crisis and Localization since we would like to talk about the directions of the world, including Jeonju, and to respond to the social crisis caused by climate change. Today, we will have presentations and discussions of people with a lot of interest in the economics of happiness, including climate crisis and localization. Through this process, I believe that the local governments of Korea, including Jeonju, and the world will take a step forward for an economy of happiness.

The past International Conference on the Economics of Happiness held in Jeonju over the 6 years has provided an opportunity for many local governments in Korea to become interested in the International Conference on the Economics of Happiness. In particular, as the Conference was held online last year due to COVID-19, it provided a great opportunity for many people to discuss together beyond time-space limitations. I hope that there are valuable discussions which are worth spreading this year as well.

Globalization, which was considered to bring prosperity to mankind, has incurred the climate change due to unlimited competition and enormous environmental destruction and spreaded Covid-19 that caused 220 million infected cases around the world. Globalization is disrupting our daily lives and the local economic system. A number of stores may be closed in the future and a lot of our neighbors will lose their jobs.

Therefore, it is very important to think about how we can respond to many problems including climate change caused by globalization. No community can survive without international cooperation, but on the one hand, it is very important to secure independence to be safe from international environmental, food, energy and capital crises. For example, it may be convenient and efficient to eat imported food with less money for now, but it could destroy the local independent food system, thereby the environmental catastrophe may destroy the world's breadbaskets and the areas with broken independent food systems will face a serious crisis. Therefore, building a local food system linking food production and consumption within the region will be a safe and efficient way to prepare for the climate crisis. If these local actions were carried out globally, we would mitigate global climate change by significantly reducing long-distance food transport. And, by activating finance at various regional scales, we will be able to reduce the outflow of local wealth, increase the income of our neighbors, thereby minimize the gap between the rich and the poor and improve the happiness of the local community.

Ms. Helena Norberg Hodge, Prof. Alf Hornborg, Mr. André Leu, Mr. Andrew Sims, and Mr. Jason Hickel were invited to discuss localization-based directions of the economics of happiness, climate crisis and localization in preparation for the post-Covid-19 era. In the session 1, we will discuss local citizens' food practices in response to the climate crisis, and in session 2, measures to revitalize Jeonju's green climate finance will be discussed. In session 3, we will discuss employment measures in response to the climate crisis.

It's shame that we cannot meet in person and shake hands but I hope that the online conference can be an opportunity to expand the economics of happiness to the whole world with the interest and participation of many domestic and foreign stakeholders. Lastly, I would like to express my gratitude to Ms. Helena Hodge, the secretariat of the Local Futures, the mayor of Jeonju, the president of the Local Government Council of the National Social Solidarity Economy, the president of the Happiness Realization Local Government Council, and related officials for your support to organize this conference. Also, I would also like to express my deepest gratitude to the officials in Jeonju Local Government and the experts for their hard work; and a number of organizations and citizens of Jeonju who participated in and helped for this conference.

Welcoming speech



Kim Seung-su

Mayor of Jeonju City

To create a future in which the happiness of individual and the citizens as a whole are harmonized, Jeonju has been making efforts to make policies reflecting various issues discussed in the 6th International Conference on the Economics of Happiness Jeonju. We made local social finance policy by creating a social economy revitalization fund and issuing local gift certificates and we transformed the food supply structure into a virtuous cycle of local production and local consumption by establishing the Food Policy Division and the Jeonju Food Plan.

Jeonju continues to innovate and change through social solidarity and courage to make the dreams of a happy future come true.

COVID-19 has shaken the world, but it has also reminded a lot of importance factors of localization including the local food production. It also reminded us of the importance of local small and medium-sized producers, businesses and local industries in providing us with jobs to meet basic needs and secure the welfare for people, ecosystems and local economies.

Both the crisis about the changing world due to COVID-19 and expectations are rising. Only desperate questions and wise actions to respond to these changes and open up a new future for the region will guide us to a happy future.

The 7th International Conference on the Economics of Happiness Jeonju, under the subtitle of Climate Crisis and Localization, will provide an opportunity to discuss (i) responsive measure of the local communities to social crises caused by climate change, and (ii) jobs, local foods and climate finance for citizens' happiness and sustainable cities.

For the 7th International Conference on the Economics of Happiness in Jeonju, which is held online this year as we did last year, your active participation and opinions will open up a greater opportunity for solidarity and exchange.

Lastly, I would like to express my sincere appreciation to Helena Norberg-Hodge, Professor Alf Hornborg, Andrew Sims, Jason Hickel, the domestic expert panelists for joining us online, and to the organizing committee for your hard work.

Welcoming speech



Kang Dong Hwa

The President of Jeonju City Council

Greetings. I am Kang Dong Hwa, the president of Jeonju City Council. I think it is very meaningful to hold the 7th International Conference on the Economics of Happiness Jeonju, to discuss the value of the future community, preparing for the post-Covid-19 era.

The crisis spreads around the world due to the prolonged pandemic circumstances and the anxiety regarding safety and infectious diseases and even the unpredictable future of our planet are amplified. The question of "how to live" and social chaos seem to be aggravating.

However, faced with such a crisis, the civilization has not been collapsed but has brought great wisdom to discover new values and use them as indicators of a new era.

I think now is the time to prepare for the post-Covid-19 era, and it's time to reconsider the new concept of the economy and the value of happiness that the Economics of Happiness has been pushing ahead.

We can find the contradictory phenomenon proven in reality: as the economy develops and modern civilization grows, the share of unhappy people are larger than happy people. I believe that the core of the Economics of Happiness is thinking about how to live, how to feel, and what kind of life is a happy life.

Unilateral sacrifice, in the midst of confrontations between civilization and nature, nation and local community, and society and individual, makes our society unsustainable. Because only coexistence can guarantee the future of mankind. This is the reason why the world is focusing on building the mutually prosperous community, the sharing economy, and the eco-friendly city, and why Jeonju has been working hard to realize this value for a long time.

I hope that the 7th International Conference on the Economics of Happiness Jeonju will be a valuable opportunity to further refine the direction of these policies and establish social values to prepare for the post-Covid-19 era.

I am very grateful for all those who participate from afar and those who have been with us through pre-recorded videos. I hope the international conference can attain meaningful and valuable results. Thank you.

Welcoming speech



Moon Seok-jin

Chairman

Hi, I am Seok-jin Moon, Mayor of Seodaemun District and Chairman of Association of Korean Local Governments for Social Economy and Solidarity.

Congratulations on successfully holding the 7th International Conference on Economics of Happiness in Jeonju despite many challenges brought on by COVID-19.

Ironically, the pandemic revealed diverse social and economic vulnerabilities of local communities we've overlooked. Now is the time to make a shift from growth-focused paradigm to seek happiness for all including the country and local communities.

The Association has pursued to solve diverse issues faced by local communities in a socioeconomic way based on our solidarity and cooperation. The International Conference on Economics of Happiness in Jeonju also shares the same value as the Association, as a part of the efforts to make local people happier and build sustainable future for the local community.

In particular, this conference designed to tackle the global issue of climate change is all the more meaningful and timely in that the threat of climate change is felt real more than ever due to emergence of contactless economy during the COVID-19 days.

So I sincerely hope this year's conference marks a good start to address climate crisis, as a venue to share good practices initiated locally and share next steps together.

The Association will continue to join the efforts to address issues faced by local communities including climate change and make them a happier place to live.

Thank you.

Welcoming speech



Kim Yeong Jong

Chairman

Greetings.

I am Kim Yeong Jong, the Executive President of the Local Government Association for GNH and the Head of Jongno-gu, Seoul Metropolitan City.

I'd like to express my sincere congratulation on the hosting of the 7th International Conference on the Economics of Happiness Jeonju and welcome everyone who participated in today's event despite your busiest schedules.

I am very pleased that the Local Government Association for GNH participate in a meaningful event where experts from home and abroad gather to discuss a happy future in Jeonju, a city of culture and art where history and tradition are alive.

At the same time, I am very sorry that I only greet you through this video and cannot see you in person due to COVID-19.

Now we are living through the global crisis. The economic growth brought us prosperity and convenience, but the globalization of the economy has occurred a crisis of materialism and polarization, and the climate change, employment instability, poverty, and discrimination still threaten our lives.

In this context, 'Economics of Happiness', which proposes a new model of the local economy beyond competition and polarization, can serve as a new solution to instigate cooperation of a community through localization and to solve socio-economic and environmental problems that we are facing.

There is a saying that "a dream you dream alone is only a dream. A dream you dream together is reality." I hope that we will gather wisdom together to spread social consensus so that an economy for people and an economy of happiness that warms the community can become a reality.

I also hope that this conference can become a place for broad discussions to move forward a happy society through the economics of happiness and to discover various policies to create a sustainable and happy city.

I want to express my appreciation for joining today's event: Moon Seok Jin, the Head of Seodaemun-gu, and the chairman of the association of Korean Local Governments for Social Economy and Solidarity, Helena Norber Hodge, the Director of the Local Futures, Kim Seung-soo, the Mayor of Jeonju, and Kang Dong-hwa, the Chairman of Jeonju City Council. In particular, I extend my gratitude to Oh Chang-hwan, the chairperson of the organizing committee and officials. And I wish all of you health and happiness.

Thank you.

CHAPTER 2

KEYNOTE SPEECH

Keynote Address

- How localisation can solve climate change | **Alf Hornborg**
- Beyond welfare, Jeonju Designs Happiness | **Kim Mi-ok**

Visions of a globalised future with renewable energy are wholly unrealistic unless we change the economy.

Alf Hornborg

Professor of Human Ecology at Lund University

Over the past two centuries, millions of dedicated people – revolutionaries, activists, politicians, and theorists – have yet to curb the disastrous and increasingly globalised trajectory of economic polarisation and ecological degradation. Perhaps because we are utterly trapped in flawed ways of thinking about technology and economy – as the current discourse on climate change shows.

Rising greenhouse gas emissions are not just generating climate change. They are giving more and more of us climate anxiety – public concern over climate change in the UK, for example, is at a record high. Doomsday scenarios are capturing the headlines at an accelerating rate. Scientists from all over the world tell us that emissions in 10 years must be half of what they were 10 years ago, or we face apocalypse. School children like Greta Thunberg and activist movements like Extinction Rebellion are demanding that we panic. And rightly so. But what should we do to avoid disaster?

You might also like:

- The country disappearing under rising tides
- Should you buy carbon offsets?
- Can you cool a house without air conditioning?

Most scientists, politicians, and business leaders tend to put their hope in technological progress. Regardless of ideology, there is a widespread expectation that new technologies will replace fossil fuels by harnessing renewable energy such as solar and wind. Many also trust that there will be technologies for removing carbon dioxide from the atmosphere and for "geoengineering" the Earth's climate. The common denominator in these visions is the faith that we can save modern civilisation if we shift to new technologies. But "technology" is not a magic wand. It requires a lot of money, which means claims on labour and resources from other areas. We tend to forget this crucial fact.

The cost of going green

As much as 90% of world energy use comes from fossil sources. Meanwhile in 2017, only 0.7% of global energy use derived from solar power and 1.9% from wind. So why is the long-anticipated transition to renewable energy not materialising?

One highly contested issue is the land requirements for harnessing renewable energy. Energy experts have estimated that the "power density" – the watts of energy that can be harnessed per unit of land area – of renewable energy sources is so much lower than that of fossil fuels that to replace fossil with renewable energy would require vastly greater land areas.

In part because of this issue, visions of large-scale solar power projects have long referred to

the good use to which they could put unproductive areas like the Sahara desert. But doubts about profitability have discouraged investments. A decade ago, for example, there was much talk about Desertec, a 400bn euro (£364bn) project that crumbled as the major investors pulled out, one by one.

Today the world's largest solar energy project is Ouarzazate Solar Power Station in Morocco. It covers about 25 sq km (9.6 sq miles) and has cost around \$9bn (£7.5bn) to build. It is designed to provide around a million people with electricity, which means that another 35 such projects – that is, \$315bn (£262bn) of investments – would theoretically be required to cater to the population of Morocco. We tend not to see that the enormous investments of capital needed for such massive infrastructure projects represent claims on resources elsewhere – they have huge footprints beyond our field of vision.

Meanwhile, our global combustion of fossil fuels continues to rise

The cheapening of solar panels in recent years is to a significant extent the result of shifting manufacture to Asia. We must ask ourselves whether European and American efforts to become sustainable should really be based on the global exploitation of low-wage labour, scarce resources and abused landscapes elsewhere.

Also, we must consider whether renewable energy sources are really carbon free. Wind turbines and nuclear power remain critically dependent on fossil energy to produce, install and maintain. And each unit of electricity produced by non-fossil-fuel sources displaces less than 10% of a unit of fossil-fuel-generated electricity. At the current rate, the renewable power revolution is going to be very slow.

Meanwhile, our atmospheric CO² concentrations continue to rise. Because this trend seems unstoppable, many hope to see extensive use of technologies for capturing and removing the carbon from the emissions of power plants and factories.

Of course, it is easy to retort that until the transition has been made, solar panels are going to have to be produced by burning fossil fuels. But even if 100% of our electricity were renewable, electric-powered aircraft and boats are a novelty and not capable of replacing the masses of vehicles in our global transport networks. Likewise, steel and cement production – required for many renewable technologies – are still major sources of greenhouse gases. Among most champions of sustainability, such as advocates of a Green New Deal, there is an unshakeable conviction that engineers can solve the problem of climate change. Central to the Green New Deal's vision is a large-scale shift to renewable energy sources and massive investments in new infrastructure. This would enable further growth of the economy, it is argued.

The problem with global tech

The general consensus seems to be that the problem of climate change is just a question of replacing one energy technology with another. But a historical view reveals that the very idea of technology is inextricably intertwined with capital accumulation. And as such, it is not as easy to redesign as we like to think. Shifting the main energy technology is not just a matter of replacing

infrastructure – it means transforming the economic world order.

The viability of the steam engine relied on the flows of human labour

The steam engine, for instance, is simply considered an ingenious invention for harnessing the chemical energy of coal. While this might be the case, the steam-driven factories in 19th-Century Manchester would never have been built without the triangular Atlantic trade in slaves, raw cotton, and cotton textiles. Steam technology was not just a matter of ingenious engineering applied to nature – like all complex technology; it was also crucially dependent on global relations of exchange.

This dependence of technology on global social relations is not just a matter of money. In quite a physical sense, the viability of the steam engine relied on the flows of human labour and other resources that had been invested in cotton fibre from South Carolina, coal from Wales and iron from Sweden. Modern technology, then, is a product of the metabolism of world society, not simply the result of uncovering "facts" of nature.

Many believe that with the right technologies we would not have to reduce our mobility or energy consumption – and that the global economy could still grow. But is that an illusion? It suggests that we have not yet grasped what "technology" is. Electric cars and many other "green" devices may seem reassuring but are often revealed to be insidious strategies for displacing work and environmental loads beyond our horizon – to unhealthy, low-wage labour in mines in Congo and Inner Mongolia. They look sustainable and fair to their affluent users but perpetuate a myopic worldview that goes back to the invention of the steam engine.

Is our goal to overthrow "the capitalist mode of production"? If so, how do we go about doing that?

In making it possible to exchange almost anything – human time, gadgets, ecosystems, whatever – for money, people are constantly looking for the best deals, which ultimately means promoting the lowest wages and the cheapest resources in less developed nations.

Despite good intentions, it is not clear what Thunberg, Extinction Rebellion and the rest of the climate movement are demanding should be done. Like most of us, they want to stop the emissions of greenhouse gases, but seem to believe that such an energy transition is compatible with money, globalised markets, and modern civilisation.

Redesigning the game

In order to see that "all-purpose money" is indeed a fundamental problem, we need to see that there are alternative ways of buying and selling. Like the rules in a board game, they are human constructions and can, in principle, be redesigned.

The only way to change the game is to redesign its most basic rules. The "system" is perpetuated every time we buy our groceries, regardless of whether we are radical activists or climate change deniers. It is difficult to identify culprits if we are all players in the same game. In agreeing to the

rules, we have limited our potential collective agency.

National authorities might establish a complementary currency, alongside regular money, that is distributed as a universal basic income but that can only be used to buy goods and services that are produced within a given radius from the point of purchase. This is not "local money" in the sense of the Local Exchange Trading System (Lets) or the Bristol pound. With local money you can buy goods produced on the other side of the planet, as long as you buy it in a local store, which in effect does nothing to impede the expansion of the global market. Introducing special money that can only be used to buy goods produced locally would be a genuine spanner in the wheel of globalisation.

The only way to change the game is to redesign its most basic rules

This would help decrease demand for global transport – a major source of greenhouse gas emissions – while increasing local diversity and resilience and encouraging community integration. It would no longer make low wages and lax environmental legislation competitive advantages in world trade, as is currently the case.

Re-localising the bulk of the economy in this way does not mean that communities won't need electricity, for example, to run hospitals, computers and households. But it would dismantle most of the global, fossil-fuelled infrastructure for transporting people, groceries and other commodities around the planet.

Solar power will no doubt be a vital component of humanity's future, but not as long as we allow the logic of the world market to make it profitable to transport essential goods halfway around the world. The current blind faith in technology will not save us. For the planet to stand any chance, the global economy must be redesigned. The problem is more fundamental than capitalism or the emphasis on growth: it is money itself, and how money is related to technology.

Climate change and the other horrors of the Anthropocene don't just tell us to stop using fossil fuels – they tell us that globalisation itself is unsustainable.

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Beyond welfare, Jeonju Designs Happiness

Prof. Miok Kim

Department of Social Welfare, Chonbuk National University

1. Background

- Policies and measures of governments intend to focus on citizen's happiness, reflecting an increasing interest in happiness. In 2016, Jeonju has already carried out the basic work: establishing policies to promote the happiness of Jeonju citizens based on developing a happiness index reflecting the characteristics of Jeonju and measuring the Jeonju citizens' level of happiness (Miok Kim et al., 2016).
- Since the development of the Jeonju's happiness index in 2016, various local governments in Korea are also trying to develop the happiness index. In this changing situation, Jeonju revised the city's happiness index developed in 2016, and conducted this study to observe the change in the citizens' happiness and link it to develop happiness policies.

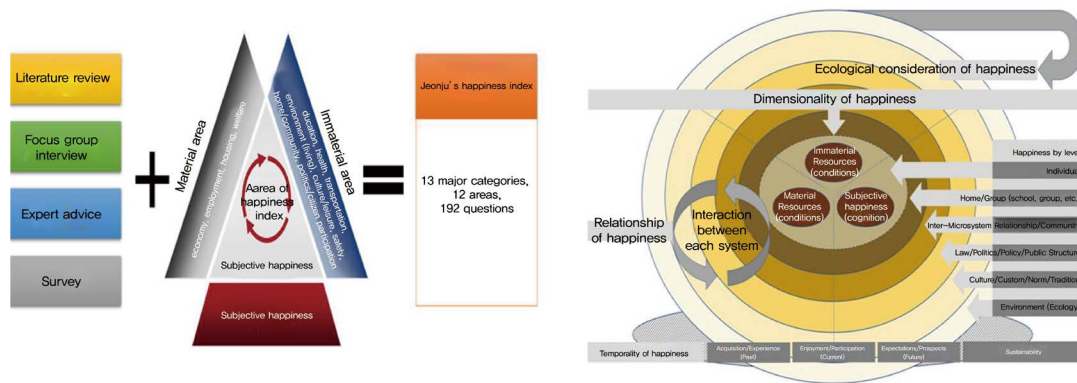
2. Development of Jeonju Happiness Index (2016) and its citizens' happiness

- Jeonju Happiness Index (2016) was developed as a customized index reflecting the city's characteristics of the three major categories of "People–City–Dignity" and Jeonju's slogan, "The city of the people, Jeonju with dignity." The happiness index consists of 3 major categories, 12 areas, and a total of 92 questions.
- The survey, based on this happiness index, shows that the happiness of Jeonju citizens as follows (Miok Kim et al., 2016). The average happiness score of Jeonju citizens was 5.79 points (out of 10 points). Even though a mutual comparison with other cities has limitations because the questionnaires are not the same, Jeonju's score is somewhat low as the national average of the happiness survey result is 6 out of points. The average score of the four areas belonging to the 'people' category is 5.98 points, the 'city' category is 5.16 points, and the 'dignity' category is 6.40 points.

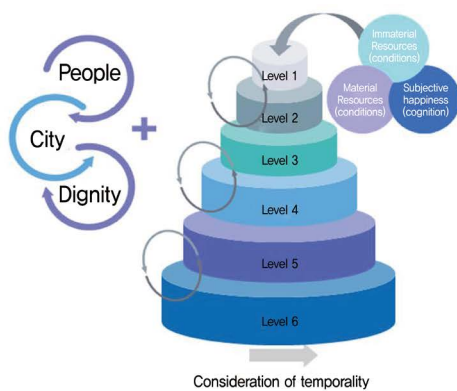
3. revision of Jeonju Happiness Index (2020)

1) 전주형 행복지표(2020) 개정과정

- Based on the literature study and taking into account the recent trends in the study of happiness index and the temporality, Jeonju Happiness Index was revised through analyzing happiness index in 2016, conducting literature review related to happiness or happiness index, restructuring happiness indicators in Jeonju Happiness Index 2016 and holding seminars for researchers.
- Through the restructuring of the happiness index areas, a total of 3 categories, 14 areas and 72 indexes were derived for the revised happiness index (2020). The schematic diagram of the restructuring process of the happiness index is as follows.



○ The Jeonju Happiness Index for 2020 has been revised based on following focus areas as follows.



[revision Focus]

Continuity: 2016 Happiness Index

Multidimensionality: Temporality, relationship, dimensionality, ecology

Simplicity: Panel Survey

Uniqueness: Jeonju Citizen

Universality: Characteristics of happiness (various happiness indicators)

Scientificity (academcity): Generalizability

Effectiveness: Linked to the happiness policy

- ✓ The 47 survey questions were established based on three major categories of 'people-city-dignity' reflecting the characteristics of Jeonju and 13 areas such as health, living, leisure, relationship, education, safety, policy/administration, living environment, ecological environment, Jeonju identity, cultural enjoyment, future/sustainability, and inclusion.

4. Survey on Jeonju Citizen's Happiness

1) Survey overview

○ To secure representativeness of the sample, the Census output area analysis was performed. The determined samples are as follows.

City	Population	Samples	Sample Quota		Total
Jeonju	655,519 people (100%)	1,100	General public		969 (88.09%)
			Basic livelihood security recipients		78 (7.1%)
			The disabled (including 40 basic livelihood security recipients)		93 (8.4%)
			Gender		Male 564(51.3%), Female 536(48.7%)
			연령	Young-aged (19~29)	206(18.7%)
				Young-aged (30~39)	173(15.7%)
				Middle-aged (40~49)	221(20.1%)
				Middle-aged (50~59)	223(20.3%)
				Elderly (60~69)	172(15.2%)
				Elderly (70~79)	105(9.5%)

2) Jeonju Citizen's Happiness Survey Results

(1) Jeonju Citizen's Happiness

○ In order to find out the happiness level of Jeonju citizens, separate questions like "How satisfied are you with your life these days?" and "Are you feeling happy now?" were provided. The life satisfaction is 7.31 points and level of happiness is 7.31.

- The result of measuring the happiness of Jeonju citizens by using the 2020 Jeonju Happiness Index with 47 revised and supplemented questions shows 6.96 points of overall average of happiness, ranged from 3.47 to 8.94. The scores for each area are as follows:

Category	Area	Score
People	Health	6.11
	City	6.40
	Dignity	6.61
	Relationship	6.71
City	Education	6.81
	Safety	7.02
	Administration	6.95
	Living Environment	7.05
	Ecological Environment	7.12
Dignity	Jeonju's Identity	7.33
	Cultural Enjoyment	7.16
	Anticipation of the Future	7.39
	Inclusion and Trust	7.41

- As a result of the survey on Jeonju citizens' happiness and future prospects, they felt somewhat happier now than 10 years ago and expected to be happier in the future.

(2) Comparison of happiness among Jeonju citizen groups

- There was no significant difference in the overall happiness level by age group. However, when analyzed separately for each category, the happiness level of the elderly was relatively lower than that of the young and middle-aged.
- The result of measuring the happiness by residential area shows that residents in Wansan-gu have a significantly higher level of happiness than those in Deokjin-gu. The higher the monthly household income, the higher the happiness level. By region of origin, the happiness of those who are native to Jeonju is the highest, followed by the citizens from Jeonbuk province excluding Jeonju. The lowest is those who came from other regions.
- Basic livelihood security recipients and the lower income group shows relatively low level of happiness compared to the others. Disabled people were also less happy than non-disabled people. As for hierarchical group, the higher the self-evaluation of social class, the higher the happiness.

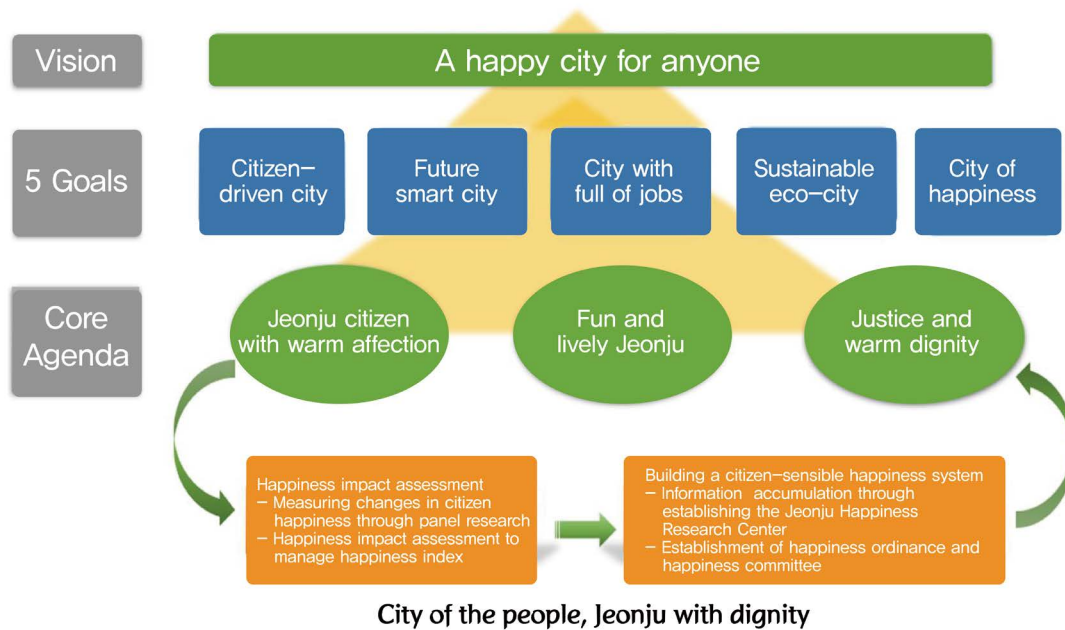
(3) Covid-19 and Jeonju citizen's happiness

- For the question asking if Covid-19 had an effect on their happiness, 62.5% of respondents answered it did. The degree of Covid-19 impact is an average score of 7.77 out of 10.
- Satisfaction with Jeonju's policies related to Covid-19 is high. The highly-rated policies that Jeonju citizens evaluated are Jeonju's emergency basic income (44.5%), quarantine (30.2%), good landlord movement (15.8%), and no layoff movement (9.4%). Regarding the policies to be supplemented related to Covid-19, a total of 39 suggestions was compiled including job creation, strengthening quarantine, encouraging and mask wearing encouragement. For the areas that Jeonju should focus on for the happiness of its citizens after Covid-19, life (37.9%) is the highest followed by leisure (15.1%), relationship (15.1), and health (11.6%).

5. Policy suggestions for a happier Jeonju

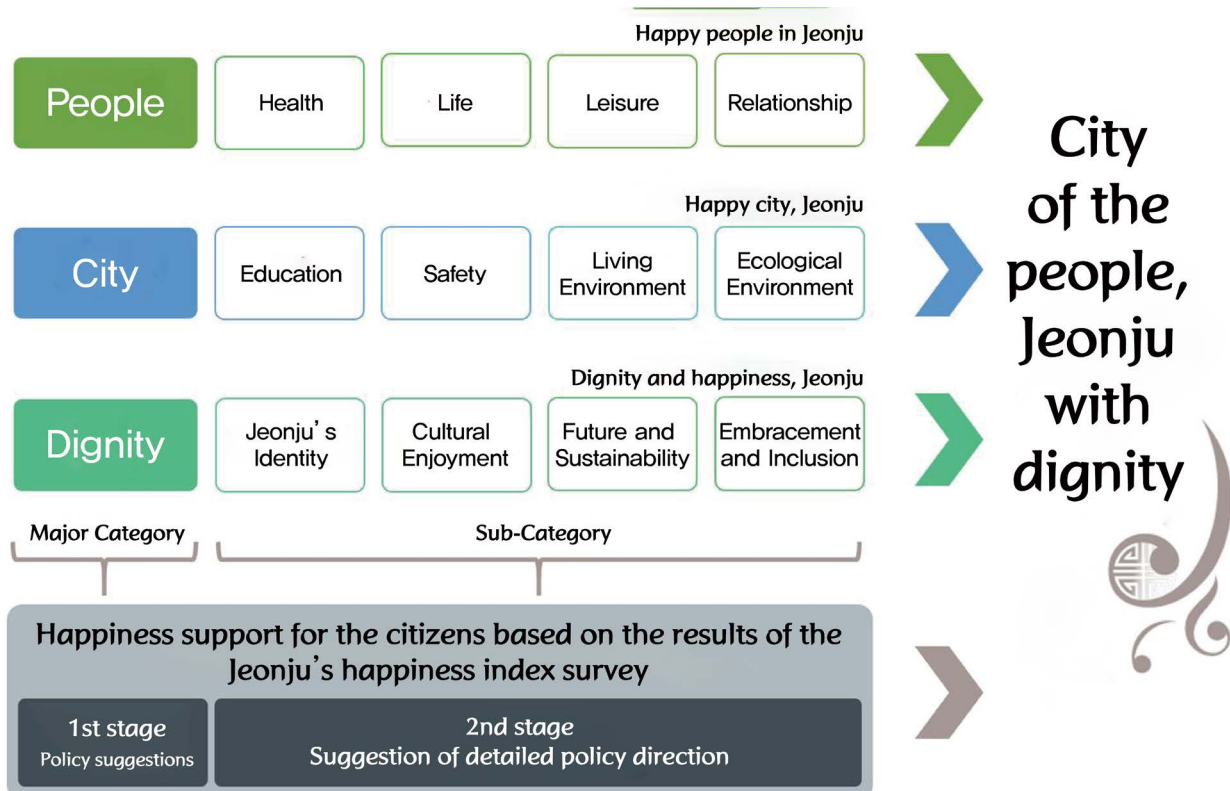
1) Vision for a happier Jeonju

- The following shows the happiness vision diagram that Jeonju has drawn based on the survey results to move toward a happier Jeonju.



2) Policy suggestions by area for a happier Jeonju

- For systematic discussion, this study divided policy proposals into stages 1 and 2, and visualize the structure of each stage.



- The major policy recommendations for each major category of the first stage are as follows. In "support for the happiness of every Jeonju citizen based on major categories," the noteworthy results of the three major categories of "people, city and dignity" were reviewed. And based on this, the direction and contents of related policies for the general public in Jeonju were presented.
 - Suggestions were made on the sub-category of "people" which consists of health, life, leisure, and relationship, and "city" of education, safety, living environment, ecological environment, and "dignity" of cultural enjoyment, future/sustainability, and inclusion/embrace.
- 3) Implication of the research and suggestions for follow-up research
- The significance of this study is that it was designed as a first-year study for a panel survey, and that Jeonju citizens' happiness was reviewed in a quantitative and qualitative way even under the Covid-19, and as a result, Jeonju's happiness policy was suggested.
 - In the process of developing a future happiness policy, a more detailed policy should be developed and implemented through in-depth investigation of the citizen group with a high level of happiness and the relatively vulnerable group.
 - As this study is designed as a primary study for a panel survey, happiness of Jeonju citizens should be longitudinally investigated and observed by utilizing Jeonju Happiness Index so that the result can be reflected in happiness policies.

CHAPTER 3

SESSION 1

Responding to the Climate Crisis, Local citizens'
practice of local food

- Local system to feed the world
| **Andre Leu**
- Responding to the Climate Crisis: Food Practice of Local Citizens
| **Lee Geun-haeng**

Session 1

Responding to the Climate Crisis, Local citizens' practice of local food

■ Program Order ■

Time (Min)	Program	Details
10:40~10:42 (2')	Opening	Opening remarks, Topic Overview and Panel Introduction, Introduction of Guests, Housekeeping notes
10:42~11:07 (25')	Speak 1	local system to feed the world Andre Leu
11:07~11:32 (25')	Speak 2	Responding to the Climate Crisis: Food Practice of Local Citizens Lee Geun-haeng
11:32~12:30 (58')	Free Discussion	The role of urban agriculture in the era of climate crisis Yang Byung-wook A diet that saves me, my neighbors, and the earth. Bae Bok-ju Shifting Agriculture and SDGs Yang Jun-hwa Agricultural and food policy needs a shift Lee Chang-han
12:30~12:40 (10')	Result Sharing	Result Sharing

Moderator and Chairperson | **Han Dong-soong** Jeonju University Professor

Local system to feed the world

Andre Leu

Australia Regeneration International Director

Local Regenerative Biodiverse Organic Agriculture Systems to Nourish the World



**André Leu, International Director
Regeneration International**

**Economics of Happiness Conference
Jeonju, South Korea, October 21, 2021.
Korea**

Food Insecurity

Number of undernourished people in the world,
1969–71 to 2010

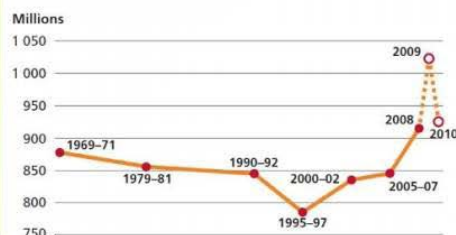


TABLE 2 NUMBER OF UNDERNOURISHED PEOPLE IN THE WORLD, 2005–2020

	Number of undernourished (millions)							
	2005	2010	2015	2016	2017	2018	2019	2020*
WORLD	810.7	636.8	615.1	619.6	615.0	633.4	650.3	768.0
AFRICA	195.0	187.4	199.7	212.0	212.3	227.1	235.3	281.6

Food insecurity has increased since the widespread adoption of industrial agriculture

This is a system based on GMOs, synthetic pesticides and fertilizers to supply distant commodity markets

Food Security?



Alliance for a Green Revolution in Africa (AGRA)

- Founded by the Bill and Melinda Gates and Rockefeller Foundations,
- launched in 2006
- vision of doubling agricultural yields, the incomes of 30 million small-scale food producer households,
- a halving both hunger and poverty in 20 African countries by 2020.
- AGRA received US \$ 1 billion from the Bill and Melinda Gates Foundation, US, UK, and German governments
- The money was spent to promote industrial agriculture to supply distant commodity markets and on GMOs, imported synthetic pesticides and fertilizers

Food Security?



Alliance for a Green Revolution in Africa (AGRA)

- Instead of halving hunger,
- The situation in the 13 focus countries deteriorated
- The number of people suffering from extreme hunger increased by 30% in its countries of intervention during the AGRA years.

TABLE 2 NUMBER OF UNDERNOURISHED PEOPLE IN THE WORLD, 2005–2020

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Food Security?



Alliance for a Green Revolution in Africa (AGRA)

- Monoculture cash crops reduced crop diversity
- Malnutrition created by reduced crop & diet diversity



General stagnation or decline in farmer staples:

- Millet: 21% decline in yields, 24% decline in production
- Cassava: 6% decline in yields
- Roots/tubers: 7% decline in yields
- Sorghum: just 3% yield growth
- Groundnuts: 23% decline in yields

Food Security?



The world currently produces more than double the food needed

- **The problem is not a food shortage**
- **It is the distant commodity market system**
- **The hungry are too poor to buy these commodities**
- The wealthy countries and developing world middle classes have too much food
- Mostly highly processed - empty of nutrition
- Obesity, Type 2 Diabetes, heart, liver and other diseases

Local Food Sovereignty is the Solution



80% of the worlds hungry live in rural areas

50% of the worlds hungry are small farmers

20% are the landless who are dependent on farm work

Source: ETC

Who the hungry are

Smallholder farmers 50%

Rural landless 20%

Pastoralists, fishers, forest-dependent 10%

Urban poor 20%

Aviable Food Future 2010

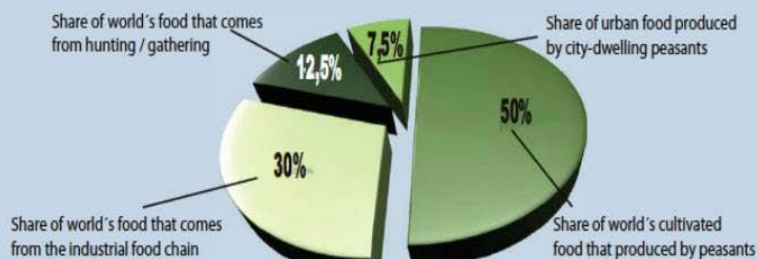
Local Food Sovereignty is the Solution



70% of the world's food is produced by small holder farmers

80% of the food in the global south comes from small holders - source: FAO

PEASANTS FEED AT LEAST 70 % OF THE WORLD'S POPULATION



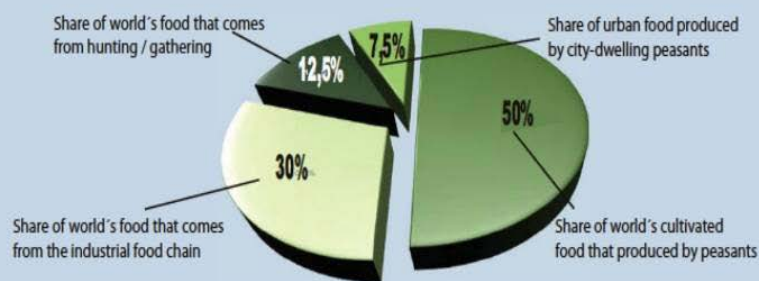
PUT FOOD ON THE TABLE FIRST



The only practical way to nourish the world is to grow the food locally where it is needed by small holder farmers

It is important to increase the production of small holders at local level to ensure adequate food security for the world

PEASANTS FEED AT LEAST 70 % OF THE WORLD'S POPULATION



Small Farmer Regenerative Organic Agriculture can Nourish the World



The majority of small farmers in the developing world are traditional farmers - organic by default

Teaching these farmers to add good regenerative organic practices to their traditional methods:

1. Better soil nutrition - recycling organic matter (carbon) and mineral balance
2. Improved pest and disease control
3. Water use efficiency - especially increasing Soil Organic Matter
4. Better weed management methods
5. Agroecology to increase biodiversity

Leads to significant increases in yields

Local Organic High Yield



A report by the United National Conference on Trade and Development (UNCTAD) and the United Nations Environment Programme (UNEP) stated on Organic Agriculture:

‘...the average crop yield was ... 116 per cent increase for all African projects and 128 per cent increase for the projects in East Africa.’

Organic Agriculture and Food Security in Africa 2008

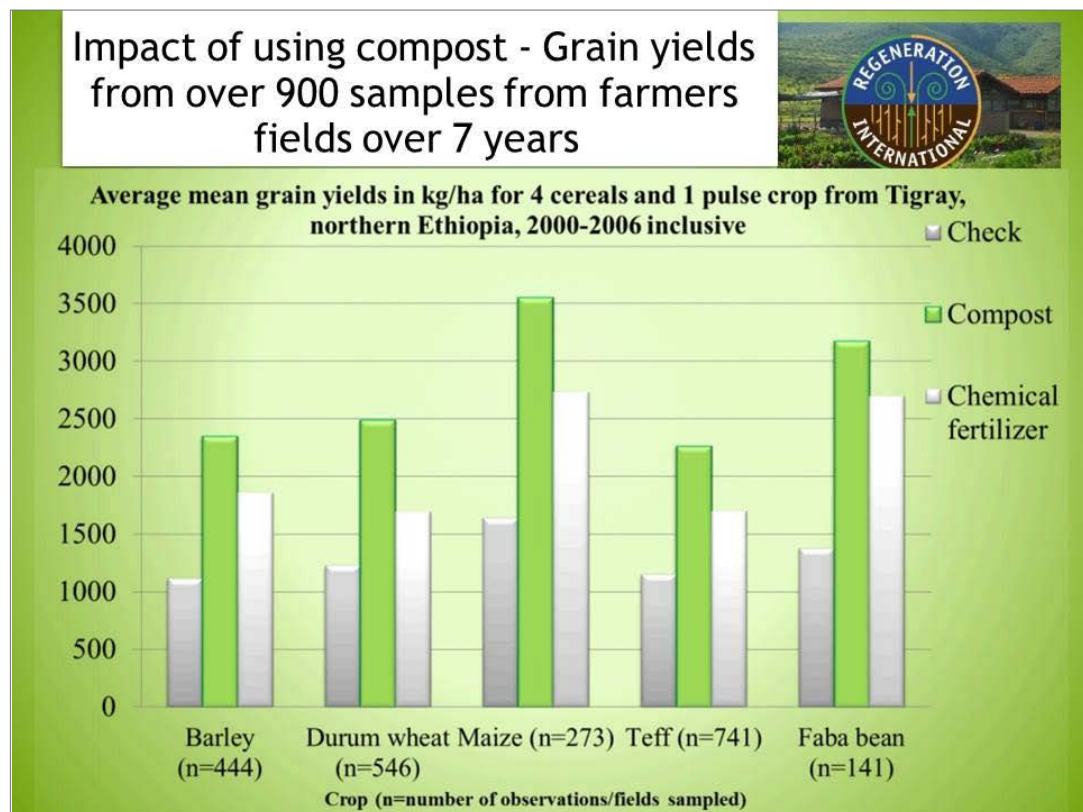
Local Organic High Yield



The report notes that despite the introduction of industrial agriculture in Africa food production per person is 10% lower now, than in the 1960s.

‘The evidence presented in this study supports the argument that organic agriculture can be more conducive to food security in Africa than most conventional production systems, and that it is more likely to be sustainable in the long term.’

Source Supachai Panitchpakdi, Secretary general of UNCTAD and Achim Steiner, Executive Director of UNEP 2008



Scientist researching wheat fields



Wheat grown on
compost treated
field

Wheat grown with
chemical fertilizers
and requiring
spraying with
fungicide

Wheat infested with stripe rust and
sprayed - gave yield of 1.6 t/ha



Wheat grown on composted soil
resists the rust - gave yield over 6.5 t/ha



Compost is made on farm or locally
at no or very little cost

Local Regenerative Organic Systems Nourish the World



The majority of farmers are small holders on 2 hectares of less

They produce 80% of the food in the global south

Training them in regenerative organic agriculture based on the science of agroecology dramatically increases yields

The industrial agriculture system of synthetic pesticides and fertilizers supplying distant commodity markets has failed

**It is time to refocus agriculture on local production
systems based on organic agriculture to primarily supply
local markets**

This is the evidenced based way to end food insecurity and nourish the world

Thank You



Responding to the Climate Crisis: Food Practice of Local Citizens

Lee Geun Hang

The Director of Korea Farming and Fishing Community

The average temperature of the Earth's ecosystem over the past 10,000 years has increased by 4 degrees, but in the last 100 years that have used fossil fuels in earnest, the average temperature has risen by 1 degree due to human activities. This may lead 2 degrees rise of the average temperature in the middle of the 21st century, thereby the global ecosystem will lose its resilience and face irreversible danger, "extinction." Life-threatening disasters and crises that limit human activities are cumulative and complex, threatening the continuity of our community.

We all know that the development methods (industrialization, urbanization, mass production-consumption) and means (fossil energy) for material growth have created the global environment of the climate crisis and prolonged pandemic. Oil, agriculture, fishing, and water consumption have already reached their peak, and the neoliberalism has entered the stage of low growth or negative growth. Nevertheless, we have not given up our desire to material abundance. We cannot solve a problem in the way that caused it. The nature warns us and the society, the climate, pandemic, and growth crises tell us we cannot return to the past, and that we must act differently. It is a time when we desperately need a change in our lives and human society.

If resources and energy are the object and goal of transformation, its core is the food production and consumption, which is the essence of life. The climate crisis and pandemic have unveiled the hidden truth and reminded us of what we need to live. You may think this is nonsense as supermarkets are overflowing with food, and smoke from grilling meat rises from every restaurant despite the severe climate crisis and the pandemic crisis. What you see with your bare eyes is not the whole picture of reality. Only when you look closely, you can see the essence of things.

Climate Change and the Crisis of Agriculture and Food

Just as we experienced the monsoon season for two months last summer, the recent climate change has been "extraordinary" and "more often." The government's abnormal climate report shows an increase in carbon dioxide concentration, an average temperature increase of 0.5° C, a 150% increase in the number of heatwave days, a 15% increase in the number of days of drought and cold waves, a decrease in the amount of precipitation and the number of rainy days, and an increase in the impact of typhoons over the past 10 years. Long-standing wildfires in Australia and Siberia are also due to rising sea temperatures.

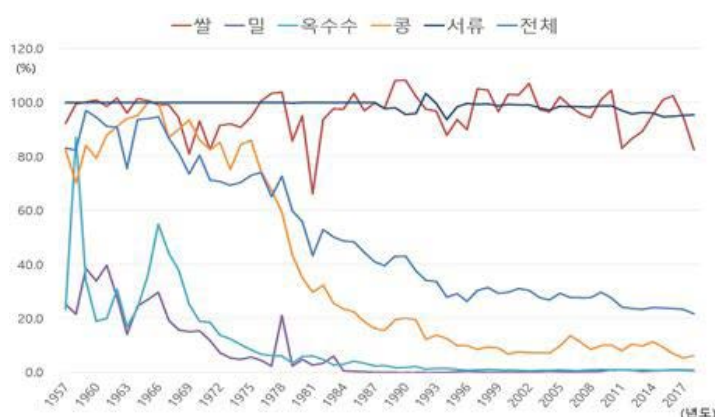
Climate change is the average weather change over a long period of time, and it also appears in changes in the solar system and the Earth's ecosystems, such as the Ice Age. However, the recent climate change is due to the increase in greenhouse gases which have emitted by the burning of fossil fuels since industrialization, which caused the global average temperature to rise rapidly. Climate scientists are warning that the recent climate change is very serious. Changes in the global ecosystem due to climate change are causing a synergistic effect. It has been reported that if the

temperature rises by 2 degrees from the pre-industrial level, it will not be possible to suppress and recover the global temperature rise no matter what efforts are made thereafter. In 2018, the IPCC (Intergovernmental Panel on Climate Change) adopted the 「Global Warming of 1.5° C」 at the 48th General Assembly held in Incheon. By 2050, it was suggested that greenhouse gas emissions should be reduced to zero, and for this purpose, 45% should be reduced by 2030. The discussion took place because there was little time left for recovery.

The abnormal climate caused by the climate crisis has the greatest impact and damage to agriculture and food production. In addition, in the long term, the instability of food production will be aggravated by the change of the crop cultivation regions. Based on the current climate change scenario, the apple production areas over the past 40 years is predicted to be changed, possible only in some mountainous regions of Gangwon-do in the 2060s. The average temperature increase of 1 degree over the past 100 years due to human activities is 25 times faster than the temperature change in the previous 10,000 years, exceeding the adaptation rate of crops and ecosystems.

The 2007–2008 Agflation, which was triggered by drought in grain-producing countries and rising crude oil prices, caused food protests in over 30 countries and led to a surge in global grain prices and inflation. The climate crisis turned into a food crisis and a socioeconomic crisis. The reason that Korea had economic difficulties but did not experience social chaos because the nation had 25% of the grain self-sufficiency rate at this time. The drought in Russia and Central Asia in the summer of 2010 led to export suspension, speculation and soaring international grain prices. This caused food and economic difficulties in the Mediterranean region, which triggered the so-called Jasmine Revolution and the collapse of long-standing political power in the region. Syria was plunged into the chaos of the civil war that continues until now, and the number of refugees increased, putting a political and economic burden on European countries, ultimately leading to Brexit in the UK, which shows unwillingness to accept refugee. As such, the crisis of agriculture and food due to the climate crisis is not just a problem of adaptation to crop cultivation.

How long can the overflowing food and abundant dining table be guaranteed? Although rice, vegetables, and potatoes are self-sufficient to some extent, wheat and corn's self-sufficiency rate is less than 1%, and soybean is barely exceeding 5%. The self-sufficiency of food as a whole, including animal feed, is about 20% and that of energy is around 6%. Will it be okay with food supply? Today's food supply is like walking a tightrope in a field where fire spread. We are fortunate to have semiconductors, automobiles, and petrochemical products to buy food such as wheat, soybeans, corn, feed grains, meat, fish and shellfish and crude oil from all over the world. If the global food supply and demand, transport, and industrial economic system are affected by the climate crisis, however, our food supply and industrial base will be at risk. Unless we make efforts to increase our self-sufficiency in this divided country, we will have no choice but to live a life dependent on the outside world politically and economically.



〈 Grain self-sufficiency rate
(including animal feed)
1957~2018,
Food Policy Material 2019 〉

Oil-dependent Agri-food System of the World

Can the transformation be achieved only through efforts to increase self-sufficiency in any way when the climate crisis threatens the production and consumption of food? The current climate crisis is not so easy. We use energy to obtain food. Since we already depend on fossil fuels, we are experiencing climate change, which affects the production and supply of food. This vicious circle can be called the dilemma of human society, which has pursued infinite growth on a finite earth.

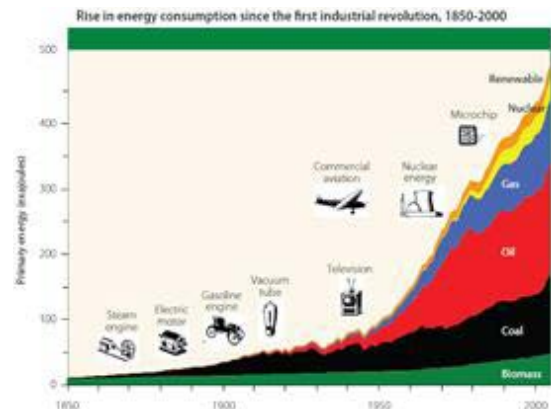
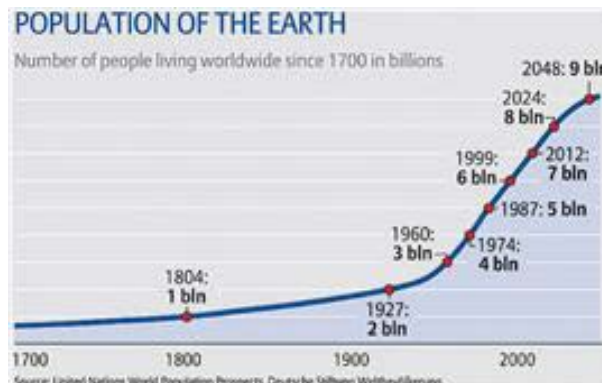
The reason humans are able to prosper on Earth is because of the growth and development of the agro-food system, ranged from production, processing, distribution, consumption and disposal of food. For 10,000 years since the birth of civilization through the Neolithic Agricultural Revolution, humankind has depended on natural energy and material circulation, and has developed productive forces and increased the population by adding labor force, animal power, and tools. At the beginning of the 18th century, the world population is estimated at 750 million.

The industrial revolution at the end of the 18th century led the use of power and energy to a different dimension (fossil fuels created by solar energy in the past), the amount of energy available increased enormously, and energy-utilizing fields were socio-economically differentiated and developed. It is the beginning of modern times. Fields that used to support agriculture or fields derived from agriculture have become industrial sectors thanks to fossil fuels, and agriculture have been called food production. Capital-based commodity became the mainstream and are classified as agri-food. Agriculture used fossil fuels to increase production and supply capacity, supporting industrialization and urbanization. In the 1920s, the population reached about 2 billion people.

The combination of fossil fuels and technology, which reached its peak during the two world wars in the 20th century, led to the so-called "Green Revolution" in the 1950s and 1960s. Ammonia synthesis, developed at the beginning of the 20th century, supported the production of bombs during the war. After the war, it led to the mass production of chemical fertilizers, which were spreaded over forests and crops. Wheat and maize yields increased and crop surpluses overflowed on the Great Plains of the US. Thanks to this, our parents' generation, whose production base was devastated during the Japanese colonial period and the Korean War, was able to receive the surplus agricultural product. In addition, they started feeding the livestock, creating a factory-based livestock industry. The poison gas technology developed during the war was developed as an agricultural poison (we call this a pesticide) that dilutes and kills insects and bacteria that gnaw crop. In this way, the Green Revolution, which combines breed improvement, chemical synthetic fertilizer, pesticide and water management technology, achieved the highest agricultural productivity in human history and became a common practice as a modern agricultural production system. By the second millennium, the population increased by 1 billion people every decade to reach 6.3 billion.

Commercialized agri-food was increased due to commercialization, industrialization, and free trade, establishing the current "global agri-food system based on fossil fuels." This is the process that agriculture has been incorporated into the global system. The abundance of food is generated by the fossil fuel-based materials, machinery, and equipment which are used in the food production as well as by the fossil energy-allowed time (storage, processing, etc.) and space (transportation, trade, etc.). Since World War II, the population has tripled, global real GDP has increased sevenfold, energy use has quadrupled, and fertilizer use has more than tripled.

Most of the energy used to produce and consume food that sustains our lives depends on fossil fuels, which has resulted in greenhouse gas emissions and climate change. Now, it shows an abnormal climate phenomenon that occurs more frequent. The vicious circle of the agro–energy–climate crisis is accelerating, which negatively affects the time, place, and yield of agricultural production.



The Global Agri–food System is an Ambush of Greenhouse Gas Reduction.

Agriculture, which relies on capital and oil, and wasteful food abundance, which depend on free trade, have created a climate crisis and are also manifested through a pandemic. The current agricultural and food system in Korea is not suitable to respond to the climate crisis, and it has been contributing to the increase in greenhouse gas emissions that cause climate change through policies that put productivity and efficiency as the priorities.

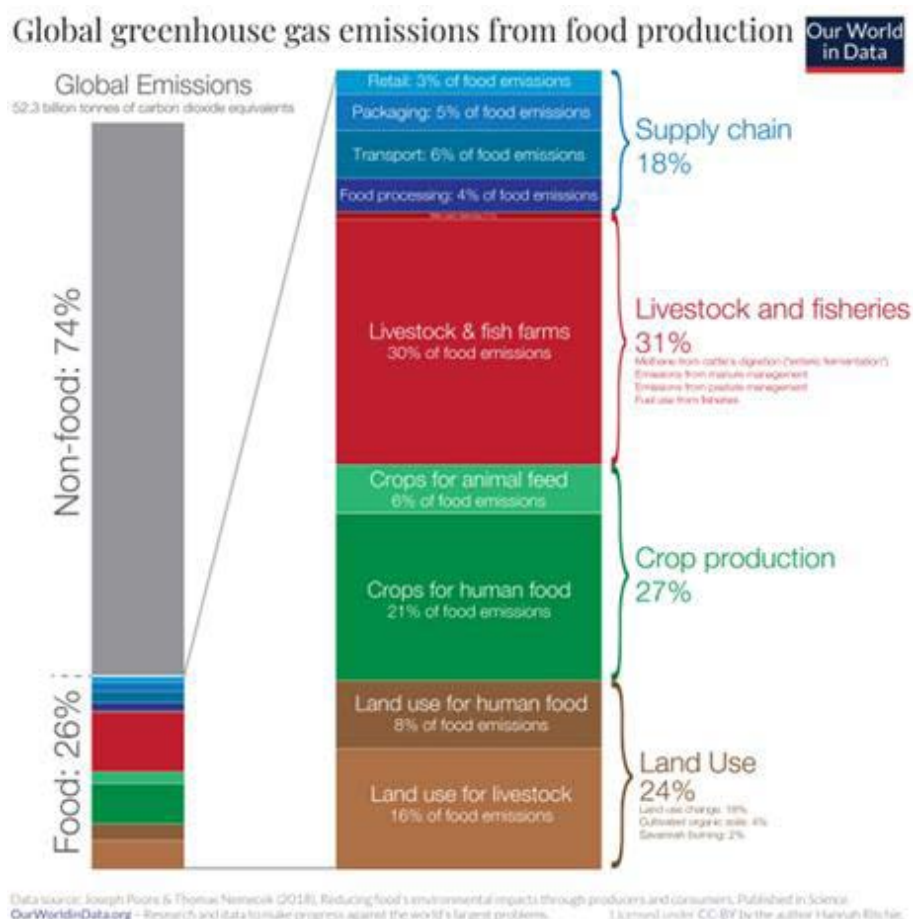
In Korea, research and testing to adapt the current situation are becoming active (e.g., smart farming, which is a different name of growth or oil farming), but research on reducing emissions is relatively neglected. The reason is that the level of greenhouse gas emission of agriculture is underestimated and the reduction effect of the sector is not as great as compared to other sectors. On the one hand, it is because agricultural production is declining compared to other sectors, so it has less policy interest. Even if it is important, it is not easy to manage the reduction in a political way.

The emissions by sector calculated and announced by the government at the end of last year (the 2020 National Greenhouse Gas Inventory Report), shows that Korea's total greenhouse gas emissions in 2018 amounted to 727.6 million tons equivalent to carbon dioxide, an increase of 149% compared to 1990. The share of energy sector is 86.9%, industry 7.8%, agriculture 2.9%, and waste 2.3% of greenhouse gases. Greenhouse gas emission per capita was 14.1 tons, an increase of 106.9% compared to 1990. This is more than five times the population growth rate of 20.4% during the same period. Korea is now being pointed out as a "climate villain" country because it is expanding its coal power generation and reducing its target of reduction. It is reported that although Korea also declared carbon neutrality last year under international pressure, when calculated by reflecting the greenhouse gas reduction targets set by major countries, Korea's per capita greenhouse gas emissions in 2030 will be ranked first among the top 10 countries in terms of gross domestic product (GDP).

For the agricultural sector, only direct emissions from the agricultural production were calculated. Of the 21.2 million tons, or 2.9%, of the total emissions, the farmlands accounted for 55.6% and

the livestock accounted for 44.4%. In terms of emission gas ratio, 57.5% of methane is emitted from rice cultivation, livestock raising (intestinal fermentation, excreta treatment), and incineration. 42.5% of nitrous oxide is emitted from soil and incineration because of chemical fertilizers and livestock manure. Another problem here is that in the global warming potential (assuming that GWP of carbon dioxide is 1), which shows the degree causing global warming, methane reaches 21 and nitrous oxide 310. Methane is generated during anaerobic fermentation or decomposition of organic matter. Livestock production is increasing due to the increase in meat consumption, and in the case of rice cultivation, it is caused by the decomposition of organic matter in paddy fields filled with water. Nitrous oxide has a large effect on over-injection of fertilizers. There are many areas for improvement in the calculation of emissions, such as the lack of applied statistical data or the development of emission factors suitable for Korea's production conditions.

According to the World Resources Institute's 2016 analysis of global greenhouse gas emissions, agriculture and land use accounted for 18.3% of total emissions. According to a 2019 survey by data sharing platform 'Data World (ourworldindata.org)', the production, processing and distribution of the global agri-food system accounted for about 26% of global emissions. Livestock and fishery accounted for 31% of agri-food's emissions, crop production accounted for 27%, land use for livestock (16%) and consumption crops (8%) accounted for 24%, and supply chains such as processing, transportation and packaging accounted for 18%, the largest share of agri-food's emissions. Reducing emissions in this sector will be a major challenge for us in the coming decades. If a quarter of the emissions are from the agro-food sector, we have no choice but to pay attention and take action. In other studies, the share of emissions from the global agro-food system is in the range of 21–37%. We can say that there is room to reduce emissions by transforming the agri-food system.



In November last year, a paper "The global agri-food system could be an ambush in achieving the 1.5 degree target" was published in a scientific journal Science. It warns that if current trends continue, GHG emissions of agro-food system that reached 30% will double by 2050, offsetting cuts in other industries. As directions for the transformation of the agro-food system, the research suggested plant-oriented diet, healthy eating, improving grain productivity, reducing food waste, and improving food production efficiency. It is only possible by cutting meat consumption in half.

Agriculture and Food are not Separate.

The agricultural sector is sensitive to the climate change and the weather. But why don't climate change and agricultural issues come to the social discussions? The biggest reason is that the proportion of agriculture and farmers is socially and economically low, and it did not receive public attention due to the political or media which do not handle it as the social agenda before it becomes a real problem. The reason of the low interest in agriculture's emission is that the agricultural production sector is only considered in terms of emission and the rate is not high thereby reducing GHG emission is expected to be small. In Korea, there is no research on estimating emissions of energy used in the entire process of food production, distribution, consumption, and disposal. This means that the life related issues is not explained. There are no studies or campaigns highlighting livestock, animal feed, and fertilizer. For example, in 2012, when interest in local food was growing, the National Institute of Environmental Research published a study on food miles (how far away and how much food is delivered). After the free trade agreement was fully implemented, in 2010, the food miles per capita was 7,000 tons · km, and the resulting greenhouse gas emission per capita was estimated at 142 kg, exceeding that of Japan. In 2010, only transportation alone emitted 7 million tons of greenhouse gases to import agri-food. There was no follow-up policy, so follow-up study did not conducted.

■ Food-mile per person by nation

(Unit: ton · km/capita)

Year	Korea	Japan	UK	France
2001년	5,172	5,807	—	—
2003년	3,456	5,671	2,365	777
2007년	5,121	5,462	2,584	869
2010년	7,085	5,484	2,337	739

■ CO² Emission per person due to import logistics

(Unit: kgCO²/capita)

Year	Korea	Japan	UK	France
2001년	106	134	—	—
2003년	104	125	104	85
2007년	114	127	108	91
2010년	142	123	95	96

〈 National Institute of Environmental Research 2012〉

he 2019 trade statistics for the item group (grains, high quality seed, livestock products, fishery products, vegetables/fruits, sugar, coffee/tea/cocoa, beverages, etc.) was analyzed by the survey method of the National Institute of Environmental Research: the total import volume was 38,050,674 tons. This is an increase in imports to 734 kg per capita. Examining the import/emission ratio of the previous year, the CO² emission from food import and transport in 2019 is estimated to be 10 million tons. This is about half of the greenhouse gas emissions from the domestic agricultural sector (21.19 million tons in 2018). We can say that greenhouse gas emissions of the agriculture sector are externalized.

In order to change our perception and behavior in response to the climate crisis, we need to know how much our food production and consumption depend on fossil fuels after going through the Industrial Revolution and the Green Revolution. We should consider Korea's agricultural and food system, which is intertwined with the global agri-food system, in an integrated way, so that we can be fully evaluate the relationship between the climate crisis and agriculture and food; we can recognize that it is our urgent transformation task; and the status and role of our agriculture can be established in the transformation process.

Emissions from the agricultural sector, which are less than 3%, are calculated only from direct emissions from food production, which is misleading the need for transformation of the agri-food system and our efforts to reduce GHG. This figure does not include the grain self-sufficiency rate of 20% and the emissions of imports and supply process which is represented as food miles. As a result, interest in the agri-food transformation policy is waning.

The reason I mentioned the figures and brought up the statistical data is to face Korea's agricultural policy. Basic policy data are made into a policy only when its social value, national policy direction and our will to implement the policy are recognized. Without a vision and direction, consistency and trust in data are lost, and policy goals are easily overturned. The reason agricultural and rural data classification, itemization, collection, management, and utilization are insufficient is because we are not interested, not responsible, not persistent, not cooperative, not being in solidarity, and not being monitored or checked. The government and producers have become accustomed to the current situation as it is difficult for producers to step forward because of the level of organizational power and the bureaucratic approach.

If we are properly complying with the Framework Act on Agriculture, Rural Community and Food Industry, the social trust in the current state of self-sufficiency and the target value that should be included in the agricultural, rural community and food industry development plan of the central and local governments would not be this low, and the direction of farmland conservation, usage and management will be different from now. An innovation is required in the agricultural administration for various regional development projects that they want to manage rather than support. It is a matter of political will and vision. To check and drive them is our task as producers and consumers.

Agricultural policy is the viewpoint and attitude toward farming. The actors of agriculture (ultimately all members of society including economic actors such as producers, politicians and experts, technical officials, and distributors as well as consumers) are engaged. The attitude toward this is like, "I understand that agriculture and rural areas are important." Supporting agricultural farming villages is simply unavoidable, and officials who handle budgets manage them as if they were giving a favor to the farmers. Farmers are, like, "It's not like we make decisions anyway." Reforming

agricultural administration is therefore not easy.

The premise of independent agricultural policy reform is making producers and rural residents play the central role from being ancillary, and have self-esteem. The attitude and behavior that we live and want to play our role derive from connectedness to the society, recognition and encouragement of our roles, self-esteem to recognize our existence and roles, and the pride of playing our social roles.

Agriculture is the beginning and still the foundation of human prosperity and civilization. We were able to create and change the way of social relations and enrich and deepen the culture based on agriculture. Agriculture represents rural area in our land, and farmers in terms of social roles, classes, and occupations. But, in fact, it means the production and life living that feed people's lives and passing them on to the next generation.

When both producers and consumers participate and play their own role, we can transform agriculture and food in response to the climate crisis. When producers and consumers recognize the agri-food system and climate crisis as their own problems and try to make a joint solution, we can move toward a transitional society.

Opportunities for Transformation, Direction of Transformation

If the socio-economic system that has been built on the human prosperity threatens the survival and happiness of mankind with a climate crisis, COVID-19, and a crisis of growth, we need the diagnosis and reflection on the cause of these complex crises.

We need to recognize and acknowledge that our current way of life (structural socio-economic system, social perception, and behavior) has caused and supported the current crisis, and that the well-being and happiness of the next generation are not guaranteed. From the point of view of global ecology, it is said that the COVID-19 occurred as a vaccine to prevent the reckless behaviors of the human as a virus. It's time to think about this.

Responses to COVID-19 are public health care and expansion of medical personnel to take care of people's lives and health, but a more fundamental approach would be to restore the health of the ecosystem. Foreign media says that the achievements of Korea's quarantine measures is because of "transparency and open communication, civic participation and public-private cooperation." Transparency, openness, and democracy are key words that will also be used in the transformation process.

Response to the climate crisis is urgent, and all sectors and regions need to reduce GHG emissions and adapt to the changing climate. It requires changes in the production, life, and consciousness of the members of the society, depending on the factors leading to the crisis, on the extent of the crisis they occurred, and on the sectors and regions.

The crisis of economic growth means that even if we cling to competition to increase capital, there is no pie that can be grown any more. We need to transform into a low-growth or zero-growth economic system.

In addition to the climate, pandemic, and growth crises, national challenges stemming from the

process of economic growth are imbalanced regional development and the overpopulation and aging of rural areas. Meanwhile, in the process of population decline and the advancement of the 4th industry, polarization is an important task to be solved. The widening gap between the rich and the poor will further divide between individuals, regions, countries, and between urban and rural areas. In the process of transformation, it is necessary to establish a minimum income guarantee, employment security, and basic income system.

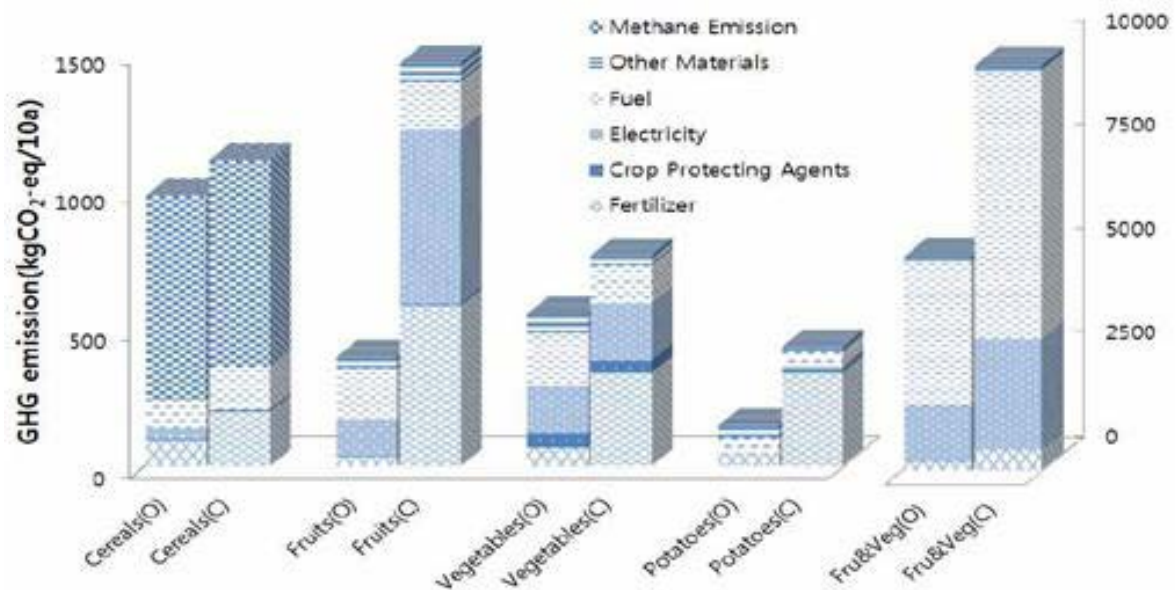
The process of transformation may be imbalanced. Conflicts may appear due to relative deprivation, injustice, and pressure to change. Unjust transformation undermines the goal of "increasing the sustainability of society." This makes "just transformation" important in the process.

Eco-friendly Agriculture?? Organic Farming? Carbon Farming!

Compared to the OECD nations, the statistics show that Korea's share of GHG emissions in the agricultural sector is the lowest, but the GHG emission per farmland is quite high. This translates that we are neglecting agriculture and focusing on high-input production.

Organic farming started as an alternative to overcome the philosophical, structural, and commercialization problems of industrialized and monoculture farming. Recently, it's paying attention to the meaning and performance of soil and natural environment, biodiversity conservation, and greenhouse gas reduction. Organic farming has been defined as "a holistic production management system that promotes and strengthens the health of the agricultural ecosystem through biodiversity, biological circulation, and biological activation of the soil." But in Korea, it has been reduced and distorted to "safe" agricultural products that do not use chemical fertilizers and pesticides. "Eco-friendly farming," including "pesticide-free" agricultural products that partially allow the use of fertilizers, is a certification system that detects pesticide residues, rather than evaluating the practice to save the land and to produce healthy agricultural products. The number of organic farming entities is 18,199, and the organic farming area is 1.8% of our land (2019). Eco-friendly agricultural products include pesticide-free agricultural products that are more than twice that of organic products. The number of eco-friendly agricultural products is decreasing as consumption is not increasing.

Of course, organic farming is evaluated to reduce greenhouse gas emissions because the input quantity such as fertilizer is small. However, as organic farming has become a common practice, nutrients and fuel are used to produce good-looking agricultural products for consumers. Eco-friendly farming does not maximize the effect of carbon reduction, reduction and storage. In order for eco-friendly farming and organic farming to have the practical experience and key to overcome the climate crisis, and to move forward to carbon farming that restores carbon to the soil, policies need to be innovated and consumers' perceptions and behaviors are required to be changed.



〈 Kim Chang Gil et. al, 2016, Greenhouse Gas Reduction Effect of Organic Farming. Journal of the Korean Society for Climate Change 7(3) 〉

Regarding the five-year plan to promote eco-friendly farming, which will be implemented this year, eco-agricultural groups called for the "establishment of a new paradigm of agricultural administration in the era of climate crisis" and suggested the following policy directions:

- ① Expanding eco-friendly farming in response to the climate crisis. In connection with the Korean New Deal, setting the goal of expanding eco-friendly farming in the 5th five-year plan for eco-friendly agriculture to 15% to make eco-friendly farming by 30% by 2030, and installation of eco-friendly agriculture promotion support center
- ② Transforming all paddy agriculture (830,000 ha) into eco-friendly farming, expanding the public procurement system, and providing "eco-friendly rice seal" to public areas such as schools, military, hospitals, and the underprivileged
- ③ Integrating regional units through expansion of eco-friendly agriculture infrastructure projects
- ④ Expanding selective direct payment to be continuously paid to eco-friendly agriculture
- ⑤ Expanding agricultural environment conservation program
- ⑥ Expanding supply of eco-friendly agricultural products for future generations
- ⑦ Supporting for the establishment of an integrated marketing organization for eco-friendly agricultural products
- ⑧ Establishing an eco-friendly public supply platform
- ⑨ Promoting organic fruit tree cultivation policy
- ⑩ Supporting for the cultivation of organic seeds
- ⑪ Making eco-friendly animal welfare policy into the basic strategy of livestock. Inducing Total Maximum Nutrient Loading System (TMNLS) and reasonable livestock breeding. Transforming into integrated corp livestock farming
- ⑫ Transforming into a process-oriented certification system and
- ⑬ Improving the eco-friendly support system. These are worth paying attention to transfer into carbon farming.

Is Meat a Staple Diet?

In a scene in a comedy film, the drug detectives are hesitating with a dinner invitation from their rivals. But they immediately accepted it because they were to eat beef. The story is about a criminal investigation, but the chicken-related episode in the film has become more popular. Because it depicts our everyday life.

In elementary schools in Gwangju, vegetarian meals are served along with normal meals. 10% of students applied, showing high satisfaction of parents and teachers. The number of students in need of dietary therapy increased, and the pilot project, which was promoted for healthy eating and responding to the climate crisis, including dietary education and students and parents' participation in menu planning. Universities across the country are also increasingly offering vegetarian meals in student cafeterias.

Livestock were raised as sacrifices in rituals 10,000 years ago and then were used to aid in farming and to make manure as organic fertilizer. Livestock is included in agriculture because paddy field farming and livestock breeding have been in a cyclical relationship for a long time to increase productivity. After World War II, a large amount of chemical fertilizers were produced resulted from the ammonia synthesis technology used to manufacture bombs, which led a dramatic increase in grain production. Livestock farming entered a new path by turning surplus grain into aid goods or animal feed. Commercialized livestock farming increased meat consumption, improved the quality. The manure was not recycled into the soil and becomes waste. In Korea, commercial livestock for gaining meat and by-products started with economic growth in the 1960s.

Through the 1970s, the number of cattle raised around the world has exceeded 1 billion, and recently numbered between 1.3 and 1.5 billion. Excluding India and other countries, 1 billion cattle are raised only for meat and processed products. The amount of animal feed consumed by livestock such as over 1 billion pigs and sheep, and 20 billion chickens accounts for 40% of the world's grain. Excluding the amount used for bio-energy, more grain is being fed to livestock than that of consumed by 7.8 billion people around the world.

The average annual meat consumption per capita in Korea increased nearly fivefold from 11.3 kg in 1980 to 53.9 kg in 2018. The meat supply is growing at an average annual rate of 5%, reaching 68 kg per person in 2018. Grain and rice consumption has steadily declined: rice consumption per capita fell below 60 kg in 2019 and 57.7 kg per capita in the average household last year. We can say that meat is the staple food.

Eating a beef burger is equivalent to a person's water consumption to bathe for two months. The water used for meat processing and dairy production accounts for one-third of the clean water on the planet. Livestock occupies 45% of the Earth's surface. A documentary film reported that a third of the land that has been turned into desert is caused by livestock.

To produce 1 kg of beef, about 10 kg of feed grains are used. More than half of the imported food is grains and 70% of that is used for animal feed. 95% of domestic compounded animal feed is imported. In line with the global grain price rise this year, agflation (inflation driven by agricultural product prices) may be occurred like the year of 2008.

It is reported that in livestock farming, representatively cattle farming, methane, is generated from

intestinal fermentation (burp and fart) and manure, accounting for 42% of greenhouse gas emissions in the agricultural sector. Methane has a 20 times higher global warming potential than carbon dioxide. The Food and Agriculture Organization (FAO) reported that livestock production accounts for 16.5% of total greenhouse gas emissions, with meat products accounting for more than 61%. The amount from all means of transportation is 13%. It is possible to cut greenhouse gas emissions by less than half just by changing from a meat-eating diet to a vegetable-based diet.

Clearly, the current meat consumption is unsustainable. The Earth now has the largest population and the largest number of livestock in the history. We are at the peak of meat eating.

Transition to Sunlight and Soil Depends on Food Choices

Today's general farming, centered on productivity, contributes to GHG emission, and at the same time is directly affected by the climate crisis. The farming that keeps the land healthy has the potential and resilience to reduce and stabilize GHG emission. Soil contains two to three times more carbon than the atmosphere, and with industrialized cultivation, most arable soils have lost more than half of their carbon. Soil has room to store carbon. Organic farming, regenerative agriculture and carbon farming can capture carbon in the atmosphere to put into the soil. A 0.4% increase in soil carbon per year could save 75% of annual greenhouse emissions. Soil carbon storage is an efficient and realistic means of mitigating climate change, maintaining the production of healthy food, reducing carbon emissions from existing agricultural production, and reducing atmospheric carbon dioxide.

The "regenerative agriculture" presented "Drawdown" written by Paul Hogan is to continuously improve and regenerate the health of the soil by restoring its carbon content, and to improve the health, nutrition, and productivity of plants by no-till cultivation, various cover crop farming, in-farm breeding, pesticide-free farming, synthetic fertilizer-free farming, and crop rotation. If the current farmland of about 43 million hectares is expanded to 400 million hectares by 2050, it is expected that a total of 23.2 gigatons of carbon dioxide will be reduced through sequestration and emission reduction.

Countries with an interest in the climate crisis and agriculture are already realizing carbon storage. At the Paris Climate Agreement in 2015, France led the "4/1000 Initiative Movement" to increase the carbon storage capacity of the world's soil, returning 0.4% of soil carbon annually to the soil for carbon neutrality. California, which is one of the world's wine production areas, is also supporting the "Healthy Soil Program," providing about 44.7 billion won over four years. Japan is also providing 8,000 yen per 1,000 square meters to eco-farms. Korea also provides subsidy for eco-friendly agriculture, but it is criticized as a pure political spin.

It is necessary to change the high materials and equipment input agriculture that depends on sunlight (fossil fuel). Energy must be regenerated to be sustainable, and matter must be circulated to be healthy. Organic agriculture that values regeneration and circulation should be encouraged and fostered. Farming, in which each breeder separately imports materials and feed and discards by-products and manure, should be transformed into circulating agriculture at the regional and village level.

Actions and Tasks of Local Citizens

Farmers need to continue and spread agriculture that saves the Earth and people, to expand solidarity with people, and to take the lead in the transformation. However, without consumers' awareness and support, it cannot be accomplished. Government policies are not changed without consumers' interest and organizational action.

Just as politicians we voted for represent us, the food we choose as a consumer supports the production method and distribution system. As a citizen, we need to choose and consume food wisely. The climate crisis can only be overcome by the transformation of the agri-food system and the transformation of solidarity between producers and consumers. Consumers need to

- ① choose organic, carbon-ecological food produced in their local area,
- ② buy only what they need and reduce food waste,
- ③ reduce meat consumption and increase their low-carbon healthy diet, and
- ④ support agriculture and transformation of food production, distribution and consumption. The organizations that production-consumption is linked together like a co-op and consumers are very important in the process.

In the era of climate crisis, Korea's food transformation is complex. First, the food problem must be recognized and approached as a food system that encompasses production-processing-distribution-consumption-disposal. As rural production and urban consumption are managed separately and commercialization policies are implemented focusing on productivity and growth, the relationship between production and consumption and producers and consumers has become distant, and high energy input and waste have been encouraged. To respond to this matter, various movements are being implemented: the local food movement to reduce the spatial gap between production and consumption, the slow food movement to reduce the temporal gap, and the co-op, package, and dietary education movement that emphasize the relationship between producers and consumers. Food disposal is also serious, but disposal at the production site or expiration date problems are insignificant. Above all, we need to recognize the relationship between what we eat and the climate crisis.

Second, self-sufficiency is also a problem. Beyond the right to self-determination and food security, it is a matter of sovereignty. The 3% of GHG emissions in the agricultural sector is derived from our self-sufficiency which is 20%. Therefore, it can be said that the GHG emission of our food system accounts for more than 30%. We need support in maintaining and expanding agriculture and rural areas in terms of public concern and food sovereignty, not productivity. It is also the foundation for overcoming regional crises and for balanced development. There are policies to increase public meal service, but a transformation movement at the national level and the whole social level is urgently needed.

The third is the transformation of production which is related to the transformation of consumption. We need to transform into production that reduces carbon emissions, carbon stabilization in soil, and carbon farming, which enhances production. It is not easy without a consumer organization that understands, and supports the transformation to regenerative agriculture beyond the eco-friendly practices. Co-ops that handles production and consumption to some extent will be able to practice carbon-neutral farming. Policy transformation should also be organized. We can start with organic rice farming and low-carbon farming. Local communities can practice production-consumption partnership movement. It's not easy with civil practice alone, but it is the path we have to take.

The fourth is to optimize livestock and reduce meat consumption. Industrialized farming, which is dependent on imported animal feed, and meat consumption surpassing rice consumption are excessive. They are not sustainable. In order to prevent livestock infectious diseases, it is necessary to change the breeding environment to secure animal welfare and to optimize the size. Vegetarianism is increasing, and more schools are trying to adopt vegetarian diets for school meals. Vegetarianism for the climate environment and activities to reduce meat consumption will continue to increase.

A lot of people are indifferent: they might be excessively incorporated into global food system or the current generation might neglect the current crises because they have enjoyed continuous affluence. There are full of mukbang and praises of beef on YouTube. Nevertheless, the climate crisis is progressing, and awareness and practice regarding food are gradually increasing. The current food system is based on the history, culture, politics and economy, and is customized to individuals. Transformation begins with individuals' awareness and practice to solve the climate crisis. The food system can be transformed when policies are reorganized and put into practice. Only then can the future generation survive.

Our life on Earth is the miracle and blessing of the universe. To sustain our life, we need to change our food production and consumption. Our choices can save the planet and change society!

The role of urban agriculture in the era of climate crisis

Yang Byung-wook

Jeonju Urban Agricultural Research Association Chairperson

In overseas nations where urban agriculture is developed, it was started to solve the food problem of the urban low-income people or to provide military support during the war. Urban farming helps emotional development of city dwellers by experiencing cultivate plants and breed insects. With its various values such as environmental improvement, biodiversity security, healthy food harvesting, sound leisure activities support, beautiful landscape creation, raising understanding of agriculture and rural areas, urban farming has developed into a civic movement that pursues to secure the sustainability of agriculture and minimize the environmental burden through environmentally friendly farming methods. In Korea, since the "Act on the Promotion and Support of Urban Agriculture" was enacted in 2011, most local governments have enacted ordinances to support urban agriculture and supported training programs and activities for the urban farming activists. As the activist participation gradually increases, their role in society is also increasing.

As more than 90% of the population lives in the urban area which is less than 10% of Korean territory, it's important to have a policy that informs urban residents of the value of urban agriculture and induces participation. In particular, now that tackling climate crisis is urgent, if urban residents understand the environment and take small actions in their lives to respond to the climate crisis, more than 90% of the people will participate in the measure.

It's clear that the climate crisis was caused by the greenhouse effect came from the increase in the carbon concentration in the atmosphere due to the rapid carbon emission after the industrial revolution. After all, modern advanced civilization is the result of trade-off with the climate crisis. To reduce carbon emissions to overcome the climate crisis, the use of fossil fuels, a traditional energy source, must be reduced, and carbon emissions in any form must be suppressed or banned. Despite the conflicting interests between countries due to different economic circumstances, consultations in international organizations and expert groups are seeking solutions. In addition, small actions in daily life are urgently needed by city dwellers. We are living in an era in which the role of urban agriculture needs to be emphasized more in the climate crisis in that small actions can be combined to achieve a great effect. The role of urban agriculture, as part of activities to reduce carbon in our daily lives, is not small. In fact, the Special Report on Climate Change and Land of the Intergovernmental Panel on Climate Change (IPCC) released in 2019 presents that urban and suburban agriculture can help us solve urban food problems, reduce greenhouse gas emissions, and adapt to the impacts of climate change. The report emphasizes the ecological and environmental functions of urban agriculture and the role of establishing a food system.

Urban agriculture is a civic movement that seeks to pursue various values pursued by urban agriculture by inducing small actions of urban residents. Among the various values pursued by urban agriculture, its roles and functions on the climate crisis and food can be summarized as follows.

First, by cultivating vegetables for food in the space around the neighborhood, it is possible to not only improve the urban environment but also secure food supply. The food secured in this way has virtually zero carbon footprint and food mileage.

Second, urban farming is based on the use of eco-friendly agricultural materials. By prohibiting or minimizing the use of materials that may threaten the environment, it is possible to limit carbon emissions accompanying the production and distribution of chemical materials, prevent environmental pollution by waste materials, and fundamentally stop carbon generated from waste material processing.

Third, by utilizing food waste that we generate in our daily lives for farming through the composting process, we are able to help the natural ecological cycle and reduce the energy consumption required for food waste treatment, thereby contributing to carbon emission reduction.

Fourth, it can increase understanding of the environment of those who participate in urban agricultural activities. On the basis of understanding of environmental conservation acquired through urban farming activities, the urban farmers will consider the environment in everyday life, which may naturally lead to practice.

Revitalization of urban agriculture requires not only the active participation of civic organizations but also policy support of the government.

First, the central and local governments should establish specific measures for win-win of urban and rural areas. Providing opportunities for as many city residents as possible to experience urban agriculture can be the first thing to propose. Urban agriculture can increase the preference for environmentally friendly agricultural products, and furthermore, lead the income increase of farmers by lowering price resistance on farm produce. This may contribute to sustainable agriculture and rural areas.

Second, the productive functions of urban agriculture should be expanded and strengthened. In order to increase the food self-sufficiency rate in the era of climate crisis, to strengthen the food system in urban areas, and to increase the agricultural population through returning to rural areas, we need to expand the category of urban agriculture beyond non-productive activities such as hobbies, leisure, and education to the areas of production, processing, and distribution.

A diet that saves me, my neighbors, and the earth. The consumption date system started with the Angry Food campaign.

Bae Bok-ju

Jeonju iCOOP Consumer Life Cooperative Chairperson

On June 17, an amendment to indicate the consumption date instead of the expiration date for food was passed by the National Assembly's Health and Welfare Committee's Legislation Review Subcommittee. The consumption date labeling system is a consumer-centered system that displays the date for actual food consumption, unlike the seller-centered expiration date that indicates the sales date.

The consumption date labeling system is the most effective and reliable system to cope with climate change and achieve carbon neutrality in 2050. Unlike in the past, refrigerated distribution systems have reduced food safety concerns, and carbon generation and social costs can be reduced by discarding and returning sufficiently ingested products because they have expired. However, although it has been discussed several times over the past 10 years since the necessity of introduction was raised in 2011, it has not been passed repeatedly due to food safety and the refrigerated distribution environment.

In 2019, the Food and Agriculture Organization of the United Nations (FAO) announced 1.3 billion tons of food waste and 3.3 billion tons of carbon emitted from it. In Korea, about 30% of household waste is generated from food waste alone, approaching 5.7 million tons. According to the cost of food waste loss according to the expiration date announced by the Ministry of Environment, 2019 and the Korea Health Industry Development Institute, the cost of disposal at home is KRW 590 billion, which costs an average of KRW 1.54 trillion a year.

In fact, the consumption date labeling system has been adopted by CODEX (Codex Alimentarius Commission) and various countries such as Europe, the United States, Australia, Japan, China, the Philippines, and Kenya. From a consumer's point of view, the consumption date not only helps determine food safety rather than the expiration date, but also reduces food waste. Since the consumption date labeling system is a system that more clearly informs the time limit of food safety, it can provide accurate information to consumers considering the time of food consumption, and the distribution industry will also devise more thorough management measures for safety. The Korea Food Information Institute predicted that food waste will decrease to 1.15% when the consumption date labeling system is introduced, resulting in an annual reduction of 886 billion won, and a 0.04% reduction in returns and disposal of food industry products, as well as social benefits by 16.5 billion won per year.

〈Note – Expiration date and consumption date of processed food〉

kind	Expiration date compare consumption date.	Storage conditions	kind	Expiration date compare consumption date.	Storage conditions
Frozen dumplings	+25일	-15℃	Frozen dumplings	+30day	0 ~ 10℃
Milk	+50일	0 ~ 10℃	Milk	+20day	0 ~ 10℃
Cream bread	+2일	0 ~ 10℃	Cream bread	+25day	0 ~ 10℃
Slice cheese	+70일	0 ~ 10℃	Slice cheese	+9day	0 ~ 10℃

* Depending on the data source–Korea Consumer Agency/storage conditions, most foods can be consumed beyond the expiration date.

After the passage of the bill, the ICOOP Consumer Cooperative marked the expiration date and consumption date of four frozen dumplings for the first time in Korea, and plans to add consumption date marks to various items in the future. In addition, various campaigns will be launched to improve social awareness of the consumption date labeling system.

Meanwhile, Weconsumer has been carrying out activities to represent consumers' positions, such as signing campaigns, relay campaigns, and statement announcements, to urge the passage of the bill. Since January, online signature participants have been gathered through the website of Weconsumer, and since April, a campaign (click campaign) has been held to take photos of consumer demand under the name of Angry Food and upload them in a relay manner on social networking services (SNS).

Shifting Agriculture and SDGs

Yang Jun Hwa

Local Sustainability Alliance of Korea Secretary-general

Agriculture, compared to other industries, has been recognized for its importance as a basis for maintaining global constancy, providing various environmental benefits, and stabilizing global civilization with population growth and urbanization.

At the same time, global agri-food system based on fossil fuels has been continuously pointed out. The need to improve the unsustainability of the current global food system is increasing as complex crises emerges.

The Sustainable Development Goals (SDGs), adopted by the United Nations in 2015 for the common prosperity of mankind, are receiving attention again due to the recent speeches by President Moon Jae-in and BTS at the UN General Assembly. The basic concept of SDGs is harmonious development of society, environment, and economy and the creating institutional base for it. It consists of 17 goals: poverty, food and agriculture, health, education, gender equality, water, energy, jobs, industrial innovation infrastructure, cities, resources, climate crisis, marine and terrestrial ecosystems and governance partnerships.

In order to make economic activity of agriculture become a sustainable activity that can solve environmental, social and institutional problems, it is necessary to review the benefits of transforming the current agricultural system into organic farming and carbon farming in line with the SDGs system.

1. No poverty – Current agriculture is increasing the poverty rate of small family farmers. Family farming, organic farming and traditional farming can provide food security and opportunities to escape poverty for family farmers and many poor people.
2. Zero Hunger and Sustainable Agriculture – Ecological agriculture increases unit production through prolificacy and enables plant genetic resource conservation agriculture, highly resilient agriculture to shift away from single species cultivation that is vulnerable to environmental changes, and transition from land expropriation agriculture to land recovery agriculture.
3. Good Health and Well-being – It guarantees healthy food that simultaneously solves obesity and malnutrition caused by excessive consumption of meat and excess nitrogen, and guarantees health and safety from chemicals such as pesticides.
4. Quality Education – High-quality education, including cultivation, environmental, and dietary life education can be provided to schools, cities, and regions.
5. Gender Equality – Multi-variety, labor-intensive agriculture strengthens the role of women farmers who are marginalised by mechanization and improves gender inequality.
6. Clean Water and Sanitation – Eco-framing contributes to securing clean water quality and abundant water resources by reducing soil pollution and restoring the soil's excellent storage capacity.
7. Affordable and Clean Energy – Eco-farming contributes to carbon neutrality by reducing the use of fossil fuels, and helps establish a resource and energy circulation system through the use of

bio-resources.

8. Decent Work – Sustainable jobs will be increased by eco-friendly production, distribution and consumption.
9. Innovation and Infrastructure – It contributes to the development of appropriate and transitional agricultural technology and transition to green industry.
10. Reduced Inequality – The increase in the value of agricultural food narrows the gap between urban and rural areas, promotes win-win cooperation, and responds to regional discrimination caused by population decline.
11. Sustainable Cities and Communities – Urban eco-farming can guarantee green space and healthy food for citizens.
12. Responsible Consumption and Production – Spreading sustainable production methods, reducing food waste, ensuring safety from chemicals, promoting energy circulation with biomass, and integrated crop-livestock circulation can establish a resource circulation system in the region.
13. Climate Action – Soil recovery agriculture that has improved carbon absorption by converting from carbon-emitting agriculture responds to climate change.
14. Life Below Water – Reducing the emission of non-point pollutants tend to be absorbed and improving water quality can preserve the marine ecosystem.
15. Life on Land – Through ecological agriculture, it is possible to preserve biodiversity, restore the health of rivers, freshwater, and wetlands, and secure genetic resources such as native seeds.
- 16 · 17 Peace and Justice Strong Institutions and Partnerships – Transition to carbon-capturing eco-farming promotes systems such as the public concept of land ownership, basic income, and balanced regional development, develops local self-reliance and decentralization capabilities and promotes cooperation between urban and rural areas and regions.

In order to answer the question of whether agriculture is a problem or a solution to overcome global crises, organic farming and carbon sequestration were proposed to build a sustainable economic system for happiness in Jeonju, the center of agricultural province Jeonbuk. Agriculture is expected to solve various environmental, economic and social problems more than simply providing healthy food.

Agricultural and food policy needs a shift to make farmers and people happy by ensuring sustainable agriculture and safe and healthy food for them

Lee Chang-han

Regional Foundation Project Director

1. Overview

- Transition is urgent for our life and human society.
- Global agriculture and food system is dependent on oil.
- Climate change and agricultural issues are not dealt with as social agenda: failure of political community or media to cover it as social agenda leads to lack of public interest.
- Both producers and consumers need to step up as joint problem solver against agriculture and food system, as well as climate crisis, as a way to move toward a transition society.
- Shift needed to low growth and zero growth economic system.
- Shifting to eco-friendly and organic farming
- Producers, consumers and citizen need to work in solidarity to play an active role for social transition.

2. Discussion

- Farming and food crisis caused by COVID-19 and climate crisis
 - COVID-19 significantly disrupted the global food supply chain and raised the chance of global food crisis.
 - With spread of the pandemic, 30 countries around the world including Russia, Vietnam and other food exporting countries imposed export ban and increased food stocks in their countries.
 - Due to shipping and transport restrictions caused by national or regional lockdown, disruption in supply chain for materials and lack of workers caused by travel restrictions, production and supply were disrupted.
 - Goods banned from export due to COVID-19 accounted for 30% of the global market and 50% of global trade volume.
 - In particular, only 4 countries reported to WTO when they imposed crop export bans due to COVID-19 between March and May 2020 when COVID-19 spread globally.
 - It fully revealed how pointless and groundless WTO and free trade are as governance, after they forced opening of agriculture and trade liberalization (abolition of tariff) claiming that comparative advantage and free trade would guarantee well-being of each country's people.
 - Experts warned climate disasters can happen any time, caused by a 2nd or 3rd pandemic and climate crisis.
 - If it leads to global crop crisis again, food exporters or international crop major players¹⁾ may

1) It refers to transnational crop corporations dominating the global crop market and strong political power. It reminds "oil major" in that crop major's market dominance is as strong.

put pressure on vulnerable countries or control supply to charge ridiculously high prices, using food as their weapon. Along with it, food crisis on a global scale also remains global risks.

- Obviously in order to respond to pandemic and climate crisis, global reciprocal cooperation needs to be enhanced enough to effectively respond to market dominance of major crop producers, export ban of crop exporters or maneuvering of speculative capital.
- However, such global promises and work in good faith can fail any time, as was evidenced by recent case.
- As such, most importantly it is a government's essential responsibility, more than anything else, in ensuring public safety and political and social stability to set up a national response system in order to create the national food security system and ensure food supply for people and political and social stability of food policy.

□ Key role of agriculture is to stably supply food essential for citizen's life and health.

- Unless a country has self-supporting capacity to supply food stably, it cannot protect public's life and safety under challenging international conditions.
- In particular, when faced with climate crisis, pandemic crisis, and resulting imbalance between food supply and demand, the survival of people will be in danger.
- That is why most advanced countries have worked hard to protect domestic agriculture and support farmers, in order to improve self-supporting capacity for food production and ensure food security from a national security perspective, taking as seriously as national defense in protecting the people.
- Korea imports food worth of KRW 26 trillion per year.
- In particular, imports take up 68.7% of major processed food materials, whereas local produce accounts for merely 31.3% as of 2019.
- Food crisis showed that there is absolute limitation of international trade in establishing food security, as evidenced by food crisis caused by pandemic or climate crisis in a globally sourced food market of today.
- Era of food crisis where food importers are vulnerable
- With accelerated globalization, countries are mutually dependent on each other under increasingly intricately-linked food supply chain.
- But as was witnessed during COVID-19, the global food supply chain connecting the whole world can stop all at once, and thus it was found that absolute importers of food like Korea are so vulnerable.
- Worsening climate and environmental crisis led to more frequent flood, draught, extreme heat, disease and insect pest, and caused an era where food production crisis on the other side of the earth affects importing countries on this side and even grocery stores around the corner.
- With frequent extreme weather conditions around the world, if not COVID-19, the world experiences more floods, droughts and heat, which is likely to result in even more unstable crop supply.

□ Enhancing self-support of food and stable production and consumption of healthy and safe food are like two wheels of a bicycle.

- Stronger self-supporting capacity for food is essential, but stable production and consumption of healthy and safe food are also essential.
- Eco-friendly food is stagnant or on decline in terms of production area or number of farmers

involved.

- Green farming area with zero pesticide or organic certification, number of certified farmers and their production decreased between 2015 and 2019: from 82,764ha to 81,717.5ha, from 67,617 to 58,055, and from 577,456 tons to 494,307 tons respectively.
- As of 2019, green farming merely accounted for 5.2% of arable land and 5.8% of entire farmers.
- Transition needed to green ecological agriculture overcoming climate crisis
- Carbon capture in soil is the most efficient measure to reduce climate change (IPCC, '19), but current high input agriculture and excessive industry-scale livestock industry are driving factors of climate crisis.
- As such, green agriculture organizations and food movement organizations in Korea conduct policy campaign to increase green agriculture 20%, reduce chemical fertilizer and pesticide 30%, shift to low-carbon livestock system, expand crop-livestock farming model, and manage scale of livestock industry at an appropriate level. They plan to raise them as important agenda in the 20th Presidential Election next year.
- Development of green ecological farming to supply healthy and safe food stably to citizen and preserve ecological environment in the low carbon era should be the top priority for agriculture and food policies. Producer and consumer citizen will take the initiative in solidarity.

□ Food justice with basic rights to food guaranteed

- Need to guarantee food for vulnerable groups
- There is no barley hump these days and people can have basic necessities satisfied with reasonable amount of money. Free meals are available for kindergarten, elementary, middle and high school students, with further food support given to low-income families.
- However, if you look around carefully, still there are many vulnerable groups. Even if their needs for basic food are met, quality and safety issues are getting serious.
- In other words, vulnerable groups for food in terms of quantity as well as food quality and safety are also a serious social problem.
- Those who take in less than 75% of recommended calorie take are deemed lacking nutrition. 12.9% of Korean people are categorized as such as of 2018, among which 14.4% are aged 65 or older and 35.1% are 19 or below.
- Building food welfare system for the elderly, and stably providing safety and nutrient food for children and the youth are essential to ensure wholesome growth and development of our future generation.
- Therefore, food support system tailored to life cycle stages, by stably setting up public school meal program which are healthy, safe and nutrient for kindergarten, elementary, middle, high and university students is needed.

□ Food inequality and skipping breakfast are social issues to tackle.

- Food problems create a vicious circle where economic inequality leads to food inequality and healthy inequality.
- In obesity rate alone, the lower income is, the higher rate is. Depending on diet habits, prevalence rates of obesity, hypertension, diabetes and other chronic diseases increase. Low-income families also show a high rate of malnutrition.
- For low, medium and high income groups, share of people with malnutrition was 10.5% for high income group as of 2018, whereas share of lower group (including low-mid and

low groups) was as much as 28.7%²⁾. It indicates even food consumption is polarized economically and socially.

- Rate of skipping breakfast is also high, and rate of people skipping breakfast went on rising between 2015 and 2018 from 26.2% to 28.9%.
 - Youth's skipping breakfast is a major problem. 35.7% skips breakfast 5 or more days a week as of 2019, and 25.5% takes fast food 3 times or more a week, showing food consumption pattern is getting worse.
 - Reasons may vary including economic hardship, diet, dual-income family or single-parent family.
 - But in terms of health and nutrition, having regular breakfast is essential in developing body, staying fit and mentally awake, as commonly recommended by WHO, health authorities and experts. The serious issue of skipping breakfast is a social issue that cannot be just left to individuals or families.
 - Achieving food justice by guaranteeing food should be done jointly by the central and municipal governments and civil society.
 - Reducing vulnerable groups is the fundamental responsibility of the central and municipal governments which are supposed to prevent social vicious circle of food issues where food inequality feeds into health inequality, and to achieve food justice³⁾ by guaranteeing healthy, safe and sustainable food for everyone. IT also requires interest and involvement of civic groups.
- Importance and roles of citizen in food
- Policies to make every citizen happy should seek to increase number of citizen who fulfill their obligations and rights to support governments, although it is equally important to create central and municipal governments working for citizen who are yet happy.
 - To ensure basic rights to food for all citizen, it is important to have individual citizen have right understanding of social aspects of food and public aspects of food policy, and take part in addressing issues in society and their daily life.
 - The citizen with the right mindset can be called "food citizen".
 - "Food citizen" refers to those who understand social relationship of food issues and significance of food education where they can learn how to live and put into action with right mindset; share food and collaborate with neighbors in solidarity; and participate in diverse social movements to tackle food issues.
 - Developing food citizen should start from children and youth of the future generation. It is to help them learn by experience in realizing social values of healthy environment and kindness.
 - To this end, food education must be a required part of curriculum (food citizen development course) in kindergarten, elementary, middle and high school years, and it should be also mandatory for the central and municipal governments to provide courses across life cycle stages as a part of life-long learning.
- Policy initiatives to ensure sustainable farming and basic rights to food
- The central and municipal governments need to develop and implement comprehensive food strategy (food plan).

2) Ministry of Health and Welfare (2019), 『Public Health and Nutrition Survey』

3) Food justice means a situation where the central and municipal governments need to implement active intervention and policies to address food inequality and achieve food justice in an unjust situation where food can be only chosen and accessible by groups who can afford to pay. (Heung ju Kim et al, "Korea's food guarantee status and policy challenges: 〈Health and Social Study〉, 2012)

- In the era of climate crisis and food crisis, enhancing self-supporting capacity for food, ensuring stable production and consumption of sustainable food and guaranteeing basic human rights to food for all citizen require the central and municipal governments' efforts to develop and implement comprehensive food strategy (food plan) as a legal requirement.
- In addition, across all stages of planning, implementation, monitoring and evaluation, it is important to facilitate civic participation and guarantee cooperation of private and public with legal grounds.
- As a governing law, Food Framework Law should be put in place, with Basic Ordinance on Food as a governing ordinance for food policies formulated by municipal governments.
- The initiatives are to build foundation to protect basic rights to food at a local and national level, ensure public's safety and health with sustainable production and consumption, and enhance public aspects of food.
- In other words, it is a journey and a challenge for individuals and society altogether to create a system where citizen can sustain healthy life with healthy food.
- If it is relevant to every member of our society, it should not be left to individuals, but handled by community, which highlights policy responsibility of the central and municipal governments for public aspects of food.
- Now is the time for both public and private must work to implement the following 9 policy initiatives when developing and executing strategies and policy programs to ensure food for citizen.

1. To enhance self-supporting capacity and crisis response for food in order to establish food security system
2. To create and enhance food guarantee system for healthy and safe food by life cycle for public (local residents)
3. To set up locally produced food procurement system across public meal programs including childcare facilities, schools and welfare centers
4. To promote consumption and production of local food and develop green farming
5. To ensure basic income of farmers who plays a major role in sustainable production and support sustainable production
6. To make dietary education for children and youth a required part of curriculum and provide life-long learning on food by life-cycle stage in order to develop food citizen
7. To support and facilitate social-economic efforts and diverse community-based cooperation by citizen with regards to food
8. To improve connect and integration of related policies across all stages of production, processing, distribution, consumption and circulation (disposal, recycling), and enhance basic rights to food and public aspects of food for public (local residents) with inter-ministerial or inter-departmental cooperation
9. To promote participation of public (local residents) in developing and executing comprehensive food strategy (food plan) and execution plan, and build and operate public-private cooperation system (food plan governance) at a local and national level

CHAPTER 4

SESSION 2

How to Revitalize Green Climate Finance in Jeonju City

- Fire in the basement: climate finance, rapid transition and action by towns, cities and regions
| **Andrew Simms**
- Jeonju Green Climate Finance Revitalization Plan
| **Lee Jong-oh**

Session 2

How to Revitalize Green Climate Finance in Jeonju City

■ Program Order ■

Time (Min)	Program	Details
14:00~14:02 (2')	Opening	Opening remarks, Topic Overview and Panel Introduction, Introduction of Guests, Housekeeping notes
14:02~14:32 (30')	Speak 1	Fire in the basement: climate finance, rapid transition and action by towns, cities and regions Andrew Simms
14:32~15:02 (30')	Speak 2	Jeonju Green Climate Finance Revitalization Plan Lee Jong-oh
15:02~15:50 (48')	Free Discussion	ESG, the protocol of the new capitalism Yoon Deok-chan Exploring social economy-based climate finance and green fund Lee Jung-hyun Jeonju's ESG Initiative Roh Eun-young
15:50~16:00 (10')	Result Sharing	Result Sharing

Moderator and Chairperson | **Son Hyeon-ju** Jeonbuk National University Professor

Fire in the basement: climate finance, rapid transition and action by towns, cities and regions

Andrew Simms

Co-director, New Weather Institute

It is not enough that we boost green and climate finance, to preserve a planet on which life can flourish, human and other kinds, we need to stop all other kinds of finance from fuelling the climate and ecological emergencies.

While it is urgent to identify and create new sources of funding to pay for fair and rapid transition, international bodies, nations, regions and cities have to stop resourcing economic activities that do not respect planetary boundaries. We will fail unless we take a whole economy approach. It would be like raising the finance to fit solar panels on the roof of a building whilst ignoring the fact that somebody else is paying for petrol to be poured into its ground floor and set alight.

Let me illustrate the central importance of this fact with reference to a major global financial centre that I am familiar with, a familiarity borne of the fact that it is my home city, London. Ranked second only to New York as a major global financial centre its influence is huge. For that reason we might be briefly encouraged to learn that London has also been ranked third in another list of 78 international financial centres for its importance as a base for global green finance. The world's second highest ranked financial base being near the top of the league for climate finance should be a great reason for hope.

Until, that is, we recall the warning of Mark Carney, until recently Governor of the Bank of England. He drew attention to an analysis of pension funds, virtually all of whom will have some foothold in the City of London, which revealed that current high carbon investment portfolios "are consistent with warming of 3.7–3.8°C", a catastrophically high level of global heating, far beyond international targets. Solar panels on a building are a good thing, but they will not save us if there is a fossil fuel, financial fire in the basement. And that is what we have.

I will talk about and illustrate some of the innovation in green and climate finance, which is an exciting and rapidly evolving field. But the greatest and fastest advances will result from a shift in overall economic policy that moves us away from the financialisation driving debt-fuelled overconsumption of the biosphere. We need more climate finance, but we need all money to be green. We need to start imagining what the day-to-day reality of an economy compatible with the 1.5°C climate target looks like, and ask how do we overcome the forces currently locking us into those planetary financial fires?

JPMorgan Chase reportedly contributed \$51.3 billion in fossil fuel financing in 2020 alone, and \$317 billion in total from 2016 to 2020. As of January this year BlackRock, the world's largest asset manager, still had investments worth \$85bn in coal companies twelve months after promising to sell most of its shares (which even if it does, merely passes the investment on).

Links to such financial institutions are like heavy carbon chains weighing us down in the rising waters of a warming world. We need to break those chains and build new financial institutions. The

City of London demonstrates the difficulty of tackling 'anti' green and climate finance because of its ancient and special privileges – such as its own special lobbyist in parliament who sits in a special seat in Parliament watching out for its interests, called – The Remembrancer – and its very own police force once known as the Night Watch. What this means is that as well as embracing bold new innovations in finance, we need municipal leaders who are brave enough to reject the financial interest that represent the old, fossil fuel order.

Green finance offers no simple fix if we do not also see cultural and regulatory change to end the high carbon lifestyles in which people aspire to drive SUVs and regularly world-hop on polluting airplanes.

I will give a few examples of what that might look like in practice

But first how do we align money with ecology?

I want to talk now about the price of money, and why I think we need what would, in effect be 'ecological interest rates'.

We need to change the way we talk about economics and how its purpose is understood. Is it possible to imagine a world in which the money system, and the prices placed on money, operate in such a way that they help resize the economy to fit with in planetary boundaries?

If we're going to tether the economics discipline to the real world, a new language is needed. One place to start is with the challenge of attempting to make interest rates, well, interesting. With more focus than ever on a green economic recovery from the pandemic and before that the global financial crisis, the fact there is no constructive connection between money, its cost & our ecological life-support system could, and should, stop us in our tracks.

Always of concern to policy makers, interest rates tend only to capture the attention of the wider public if they have savings or a mortgage. But, if you take even a passing interest in life's ecological foundations we should be talking about having an ecological interest rate. Globally the economy has outgrown the carrying capacity of the biosphere, as a conservative, annual assessment of ecological overshoot makes clear. It is as if we are trying to push size 10 economic feet into size 6 planetary shoes (in Korea that would be about a size 290mm foot into a size 250mm shoe).

The size of the economy, in turn, is fuelled by the supply of credit, which may then take different monetary forms. More money in circulation tends to increase conventional economic growth – as measured by a rise in the narrow indicator, GDP. This doesn't necessarily mean the productive economy is getting bigger, or that the majority are benefitting from it, but it almost certainly does mean that sources of irreplaceable ecological value are being liquidated.

Interest rates are the price paid for borrowing money, and when the price of money is positive, which it usually is, more has to be paid back than was actually borrowed. Hence interest, and especially compound interest (interest paid on the original sum borrowed and the accrued interest), also motivates orthodox growth reliant, as it is, on an extractive economic model that exploits the biosphere and human labour.

Why efficiency will not save growth

We know that the economy's footprint is already too big. The UN Environment Programme's late 2020 publication of the International Resource Panel (IRP) Report, *Resource Efficiency and Climate Change: Material Efficiency Strategies for a Low-Carbon Future* found that emissions from the extraction and production of materials such as metals, minerals, woods and plastics more than doubled from 1995 to 2015, accounting for a full quarter of global emissions. In 2020 it was reported that for the first time that consumption of resources passed the 100 billion tonnes mark, and global material use is projected to rise dramatically on current trends to 170–184 billion tonnes by 2050.

Driving all this growth and increased consumption is our wider economic and financial system, with money and its price as lubricant and enabler. Because money is a social construct – 'a promise to pay', it cannot be finite. We can always make another promise. But the human or ecosystem's ability to fulfil that promise – to meet the liability – is finite.

So, is it possible to imagine a world in which the money system, and the prices placed on money, can operate in such a way that they help resize the economy to fit within planetary boundaries? What might an ecological interest rate look like? Monetary policy (control of the amount of money in circulation and how it is created) is essentially meant to warm things up, or cool them down (more than appropriate given the threat of global heating). This depends on the needs of the economy at any particular time, and what is needed in the interests of society and ecological health.

In a climate emergency this means making money expensive and hard to access for what you want less of – such as high carbon goods and services – and cheap and easily available for what you want more of – such as clean, community owned renewable energy, large scale home energy retrofit programmes and public transit systems. It's basically the same principle as for good taxation policy, namely – tax more what you want less of, and less what you want more of.

It is worth saying at this point that there is one very obvious option open to city and regional authorities who are committed to low carbon transition. The divest–invest movement aiming to remove investment from fossil fuels and see it shift to green options has grown from virtually nothing less than a decade ago to be a major force for change. From the first known, active divestment from fossil fuels by the small Unity College in Portland, Maine, United States in 2012, the movement grew in just six years to reach its 1,000th divestment by late 2018. Today there are over 1,300 institutions, including government and pension funds, with a combined value in excess of \$14 trillion engaged in fossil fuel divestment. Every municipality that cares about the future should be scrutinising its full investments and switching any that are high carbon to green options.

Returning to the cost of borrowing, it should be made much higher for those banks and other investors who are actively investing in coal, oil and gas, and fuelling the crisis for as long as that is allowed to continue. Currently, the rate of interest rarely if ever includes ecological impact. There's plenty of talk about so-called ESG factors (environmental, social and governance), but this doesn't even scratch the centrality of the interest rate in allocating the trillions of capital in the economy.

Yet, even within the scope of already available mechanisms, there are practical ways to implement these principles. Banks have to hold certain amounts of capital against the lending they do. These so-called 'capital adequacy requirements', are set in Basle, Switzerland, by the Bank for International Settlements, according to the risk weighting of a loan which ranges from 0% (not at all

risky) to 150% (very risky).

At the moment the cost of debt to the big oil and gas companies is the same as to the major renewable power companies. But the risk weighting of lending to fossil fuels could be raised so that more capital would need to be held against it. Conversely clean energy loans could carry very low-to-zero risk weightings.

Because this system is already set up, and because big companies are already pre-categorised for their type of activity under standard industrial classifications for things like their listing on exchanges such as the FTSE, it could be changed automatically. Hence renewables might, for example, attract a risk weighting of 20% or less (possibly aided by government guarantees as essential support for a green industrial policy), and fossil fuels have a new higher rate of, say, 200%. This would mean that when 'Company Green' – focused on renewables – goes to the bank, it will pay a much lower rate of interest compared to 'Company Brown' working in the fossil fuel sector.

At one end of the market for selling money, following outrage at predatory pricing by so-called 'payday lenders', a modest interest rate cap was introduced in the UK in 2014. And, most countries have 'usury laws' to control the upper limit of how much interest can be charged. But, of course, that logic could be flipped, and states could insist on a higher, minimum rate to be applied to money lent to fossil fuel companies. Immediate and profound intervention is needed to influence energy investment patterns and carbon 'lock-in'. This alone would transform the availability of green and climate finance.

At a more household level, high carbon lifestyles have been locked-in by the easy availability of credit which actively incentivises them and makes them attractive. The highly evolved system of car finance is a major example. But, with everything that we know about the human health and climate impacts of SUVs, petrol and diesel cars, why are banks allowed to lend for their purchase in such a way that people don't even think twice? Rather than waiting years for the phase-out of internal combustion engines, the risk weighting of loans to petrol and diesel engine cars could similarly be top rated. In this way high carbon loans become less attractive to the lenders, making them and more expensive to borrowers, and dramatically increase the finance available to support purchases of green transport options.

One of the other many current hidden subsidies to commercial banks in the UK is the public guarantee of individual depositors. The state deposit guarantee scheme means that the first £85k for every saver is insured by the government – if the bank goes bust, you still get your money back. It's a huge public underpinning of private backing. In return – as a quid pro quo – a government that is serious about its climate policy could determine that those deposits – cheap money for the banks – could only be used for investing in the public good, and prevent them going towards high-carbon activities.

A new approach is needed for both private and public rates of interest. Central banks and supervisory monetary authorities have as their core mandate the maintenance of financial and monetary stability. Acting to prevent the allocation of vast financial resources into climate breakdown, with its catastrophic implications for humanity and the wider economy, is therefore directly aligned with their fundamental purpose. When recently the UK Treasury published *The Economics of Biodiversity: The Dasgupta Review*, it was lauded in some circles as official recognition of the need for economics to more fully account for its reliance on nature. It was also condemned by others for

seeming to promote the potentially destructive financialisation of ecosystems.

Both of these points of view can be true! But, one point it concedes clearly, is that large parts of nature need removing from the price-based market system altogether. "In light of the non-linearity of ecosystems," it observes, "quantity restrictions are a more effective policy approach than pricing mechanisms," and quantity restrictions mean setting aside large parts of the biosphere from exploitation, and hard limits on extracting from nature and pouring waste into it. Figures of between 30% – 40% of land and sea areas needing protection are mentioned.

At least three decisive shifts are needed in the financial system.

One is a cultural shift within banking, has been much discussed, partly perhaps because it is attractively easy to create an impression of taking action by doing so. But it is also vague and its material impact hard to measure.

Second is the overdue, needed shift in policy and regulation, to immediately make bad things harder and more expensive to do, and good things easier.

The final shift acknowledges the limitations of the other two. There is a need for a fresh, new set of financial institutions and mechanisms – ranging from regional banks, to mutuals and, national green investment banks – whose primary purpose is to enable an economically beneficial and socially equitable low carbon transition.

The creation of green investment banks will be a key part of the new financial architecture needed. The UK experienced a 'false start' after the disappointment of its original Green Investment Bank, sold to the Australian bank Macquarie (ironically a major financier of coal and fracking projects). Following calls for a replacement in late 2020 the Chancellor, Rishi Sunak, confirmed plans for a new Infrastructure Bank, and in June this year the UK Infrastructure Bank was launched with an initial £12 billion of capital and permission to issue £10 billion of government guarantees. Campaigners lobbied for it to be given a solid mandate to invest in a low carbon, rapid and socially just transition, and its declared mandate is "to help tackle climate change and support regional and local" economic development or, in other words, levelling-down carbon emissions whilst levelling-up poorer regions.

The OECD has looked at the range of national and sub-national green investment banks created to leverage green and climate finance, and there is a global network for different green investment banks to learn from each other. In mid-2020 there were already twenty-seven known green banks in existence with 25 additional jurisdictions exploring the creation of one.

But the potential for a much bigger shift as the world works to recover from the coronavirus pandemic is much bigger. Of the huge sums allocated by OECD and other countries, \$336 billion worth has 'environmentally aligned measures.' But this is less than one fifth of the total allocations. Other regions, such as Latin America have spent with radically less aligned, only allocating 2.2 percent to environmentally aligned measures.

As well as setting and resourcing national objectives for fair, low carbon transition at the national level, where examples range from new, separate institutions like Mongolia's Green Finance Corporation to new, add-on facilities like the Development Bank of Southern Africa's Climate

Finance Facility, Green Banks can optimise action at the city and regional level. They can be the vanguard of financial system change and provide purpose-built institutions or facilities that are tailor made to meet local financial, political and institutional contexts and needs, and specific challenges. There are of course many other innovations happening right now that don't require whole new banking infrastructures, but can work with and complement them.

In the UK there is experimentation happening with Community Municipal Investments (CMI). These allow individuals to invest directly in their local authority for specific purposes. The attraction for individual investors is that any risk relating to the investment is not linked directly to the project, but rests with stability of the overall council, which carries the project risk. In the UK there is legislation that requires councils remain financially viable giving a broader guarantee, and council borrowing is tightly regulated, perhaps too much so. So, there are lower returns but investments are relatively safe, such as with other Government-backed investments. Recent examples include West Berkshire District Council's CMI used to build new local solar power with about one fifth of money coming from local people. Another CMI allowed Warrington Borough Council to fund a new hybrid solar-storage farm. The solar farms is expected to generate not only clean energy, but a £100m+ operating surplus over 30 years, helping to fund other core services. Since these two pioneering examples, another five councils from England and Wales – Blaenau Gwent, Cotswold, Eastbourne, Islington and Lewes councils have committed to a bond or similar municipal climate investment. Other recent changes in the tax-free ISA savings sector, should enable councils to tap into the £650 billion ISA market.

Placed based green investment

There is a rising interest also in so-called 'Place based finance'. A finance platform was set up in 2019 by the Place Based Climate Action Network (PCAN) which explicitly is directed by open citizen engagement through climate commissions, which are based on 'sortition', a process like jury selection to ensure broad representation of the community. The PCAN Finance platform 'aims to build a community of practice which helps to connect the supply and demand for finance at the local and regional levels.'

It has done so by working with three Climate Commissions in the major UK cities of Belfast, Edinburgh and Leeds, and operates on three levels, mobilising finance within place identify the scale and potential sources of finance, mobilising finance into place, working with financial sector institutions and policymakers to improve inward flows of capital, and mobilising finance from place working with the financial community within the cities.

The Leeds Climate Commission and Leeds City Council raised funds to develop a Leeds Low Carbon Investment Prospectus (LLCIP) to attract investment for transition in commercial and public buildings.

In the South West of England a new regional mutual bank, the South West Mutual, aims to exemplify the kind of new dedicated financial institution to exemplify and help mediate this approach of place based green investment.

Belfast demonstrated how local anchor institutions like building societies, credit unions and pension funds provide a potential financial ecosystem could play. The Northern Ireland Local Government Officers Superannuation Committee (NILGOSC) has a climate policy and manages £8

billion of assets. The region also has estimated household savings of £11 billion.

The Local government pension scheme (LGPS) has a potentially huge role to play. With £326 billion the LGPS is the UK's largest public sector pension scheme. Its funds are locally managed by 98 sub-regional Administering Authorities. At the moment its contribution to high priority areas for transition is tiny with just £300 million earmarked for so-called place based impact investment. But interest is growing in places like Greater Manchester, Strathclyde in Scotland, and West Yorkshire. The Nottinghamshire Pension Fund provided long term finance to Nottingham Community Energy to build a solar farm for the benefit of the community. Not only does this provide jobs and clean energy, but also generates a regular income to community fund which supports a range of local projects.

Never forget the basics – a society can always pay for what it needs when there is a will

These are some of the new and specific ways to boost green and climate finance at the city level. But it is important to remember also the big picture, which reminds us that there is no excuse for finance not to be available to do what is needed.

As we have addressed in our Green New Deal Group, looking at the UK as an example, there are basically two ways of financing investment in a Green New Deal: by accessing new credit and by drawing on existing savings.

Credit is available from the traditional banking system. Commercial banks can provide credit to the government as they did at scale during the Second World War, receiving valuable 'Treasury Deposit Receipts' (TDRs) in exchange. The Bank of England provides credit to the government by influencing and managing first the bond market and second, the rate of interest. It does this by purchasing government bonds at low rates of interest, helping the government finance its spending at low cost.

As such the government is able to draw on its version of credit financing for the purchasing power it needs – subsequent government spending has a multiplier effect generating tax revenue. Government can also draw on existing savings held by individuals, banks, pension funds, insurance companies and other savings institutions. UK savers put £70 billion a year into accounts that have tax incentives (ISAs). £100 billion a year goes into various pension funds that also benefit from tax relief. It is attractive to the managers of all these savings to deposit them with the government because it is a safe and flexible place to invest. Hence, in the UK a Green New Deal costing around £100 billion a year could be financed by a government with a mix of credit and savings.

Additionally, on the Bank of England's website, the large scale public creation of money (quantitative easing, 'QE') has gone from being a seemingly exotic financial tool to one so standard that it now sits as one of the two default tools of monetary policy alongside the interest rate. The 'magic money tree' has set down deep roots. Since the financial crisis in 2008, the UK has created £895 billion of QE, the vast majority, £875 billion, created to buy UK government bonds. While much of this has been poorly managed and undirected, both the former governor of the Bank, Mark Carney, and former Chancellor, George Osborne, conceded that there is no reason in principle why QE could not be directed, such as being used as green or climate finance.

What else?

I've talked about some of the shifts in mindset, power and institutional architecture needed, and given a flavour of the many innovations going on in green and climate finance. But I want to finish with a couple of examples of what cities can do right now to signal a change in culture. First of all cities can signal a decisive break with the polluting past by endorsing the newly proposed Fossil Fuel Non Proliferation Treaty. Jeonju could join the many other cities and sub-national governments who already have including those ranging from the city of Los Angeles, to Barcelona, Sydney, Toronto, Vancouver and the Australian Capital Territory. The Treaty seeks to draw a line under our fossil fuel past and commits to locking-in no new dependence on coal, oil and gas. This is tackling the systemic supply side problem of fossil fuels.

But secondly we need to stop the culture of demand that encourages lifestyles based on overconsumption. For this reason Jeonju could emulate the pioneering spirit of local councils and cities like Norwich, Liverpool and North Somerset in the UK and Amsterdam in the Netherlands who are taking measures to end high-carbon advertising for things fossil fuels, aviation and petrol engine cars. Internationally there is a clear precedent in what was done to end tobacco advertising. We are familiar with air, water and noise pollution, but the adverts which promote high carbon products, lifestyles and services have become a kind of brain pollution that in the public domain we are exposed to without our consent. There is now a Europe wide campaign to introduce a new regulation to end this kind of advertising to help clear the air and clear our minds in cities.

I am very aware that Korea's own Green New Deal is already greatly more advanced than measures in my own country, but I hope that at least some of things I have said have been of interest, and may be of some use to put out the fire in the basement as we install solar panels on the roof.

—ends—

Andrew Simms, October 2021

Andrew Simms is an author, political economist and campaigner. He is co-director of the New Weather Institute, coordinator of the Rapid Transition Alliance, assistant director of Scientists for Global Responsibility, a research associate at the University of Sussex, and was policy director for many years at the New Economics Foundation. He was a co-author and publisher of the original Green New Deal in 2008. Andrew devised 'Earth Overshoot Day,' marking when in the year we start living beyond our ecological means and, with Prof Peter Newell, proposed the Fossil Fuel Non Proliferation Treaty, now a major international campaign. He also coined the term 'Clone Towns' describing the homogenisation of high streets caused by chain stores. New Scientist magazine called him a 'master at joined up progressive thinking'. His books include *Cancel the Apocalypse*, *Ecological Debt*, *The New Economics*, *Tescopoly* and *Do Good Lives Have to Cost the Earth?* His latest, *Economics: A Crash Course*, is the first beginners guide to the subject written from a plural, new economics' perspective, co-authored with David Boyle. He has also edited and contributed to a series of collections of 'modern folk tales for troubling times'. His other current campaigns include *Badvertising* – to stop adverts fuelling the climate emergency, and *Car Free Mega Cities*. He tweets from @andrewsimms_uk

JeonjuGreen Climate Finance Revitalization Plan

Lee Jong-oh

Korea Sustainability Investing Forum Secretary-general

Jeonju Green Climate Finance Revitalization Plan



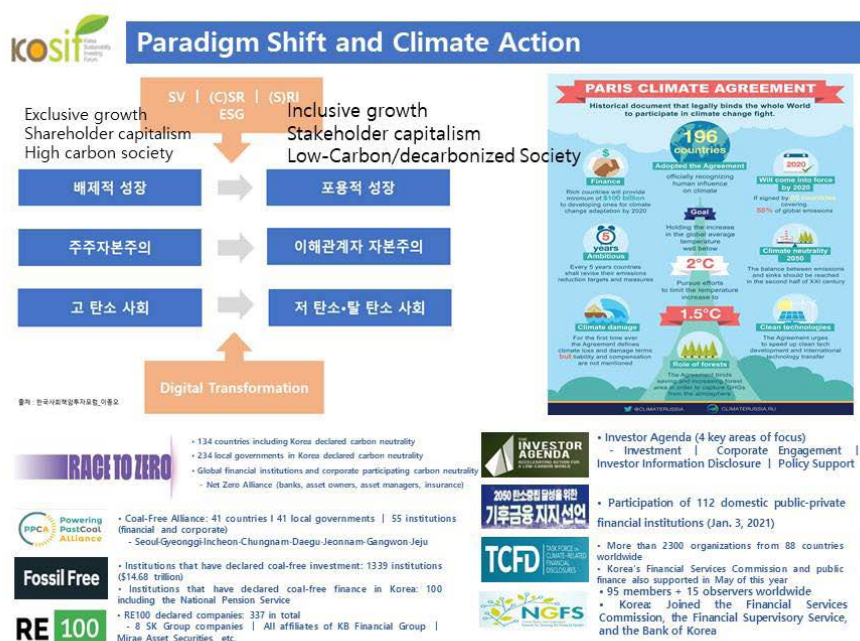
Oct. 21, 2021

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1



2



The Definition of Green Finance and Climate Finance and Changes in Global Interest

■ Global interest in green finance and climate finance

- the interest in the three keywords of green finance, climate finance, and sustainable finance has recently increased from January 2004 to September 2021 in Google Trends. In particular, the interest in green finance is the highest.

■ Global definition of green finance and climate finance

- Climate finance: focus on financing to tackle climate change including climate change mitigation and climate change adaptation

- Green finance: climate change mitigation (GHG reduction) + climate change adaptation + other environments

- To support green growth by providing funds to the production of goods and services that improve resource, energy efficiency and environment throughout economic activities

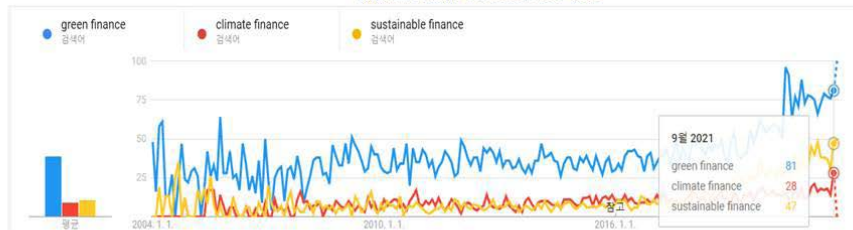
- To create an autonomous review and monitoring system to effectively block the funding which destroys the environment (UNEP FI)

[Figure] Concept of Sustainable Finance



Source : UNEP(2016)

[Figure] Change of interest over time



Source : Google Trends

3



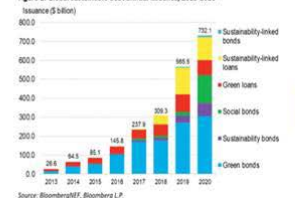
Domestic and Overseas ESG Investment & Bond Size

FIGURE 1 Snapshot of global sustainable investing assets, 2016-2019 (USD billions)

REGION	2016	2018	2020
Europe*	12,040	14,075	12,097
United States	8,723	11,995	10,081
Canada	1,065	1,699	2,423
Australasia*	516	734	906
Japan	474	2,180	2,874
Total (USD billions)	22,839	30,683	35,301



Figure 1: Global sustainable debt annual issuance, 2013-2020



Source : Bloomberg L.P., Bloomberg L.P.



2020 Global Sustainable Bond Issuance \$732 billion

ESG investment size as of the end of 2020
About 105 trillion won (estimated)
National Pension: KRW 101.37 trillion (direct management KRW 93.7 trillion, commission management KRW 8 trillion)
ESG Public Offering Fund: KRW 3.37 trillion

4

Strategies for 2050 Carbon

Neutral Promotion Strategy (draft)
Policy financial support
Transition to a low-carbon industry
Capital inflow
Green classification system
Green portfolio
Climate risk management
Public disclosure of environmental

onsible Investment

ance Promotion Plan Detailed

ing the role of the public sector
strategy to expand financial support
ctor
a dedicated green finance
r each policy financial institution
Green Finance Council among
institutions
reen finance performance in the
ent company selection index

f Mangan Finance
reen classification system
est standards for green finance
g green bond guideline pilot

climate risk management

n for financial companies
cial infrastructure maintenance
ic announcement and disclosure
information of a corporate

tewardship Code Revision
nt of environmental standard
sm
information sharing platform



Korea's Green Finance Promotion Plan

Green Finance Promotion Plan

The green finance promotion plan draws 12 actionable tasks by substantiating the green finance activation part of the <2050 Carbon Neutral Promotion Strategy>

<2050 Carbon Neutrality Promotion Strategy> : ① Leading policy finance support ② Inducing private capital inflow ③ Reorganization of market infrastructure

2050 탄소중립 뒷받침을 위한
녹색금융 활성화 전략

Source: Financial Services Commission + Ministry of Environment, 2021 Green Finance Promotion Plan, Jan. 25, 2021

Implementation strategy, 12 tasks, Institution		2021년			
추진전략	12대 실천과제	주관 기관	1Q	2Q	3Q 4Q
1. 공공부문 역할 강화	① 정책금융기관별 녹색분야 자금지원 확충전략 마련	금융위, 정책 금융기관	Financial Services Commission, Policy Financial Institutions		
	② 정책금융기관별 녹색금융 전담조직 신설	정책 금융기관	Policy Financial Institutions		
	③ 정책금융기관 간 '그린금융협의회' 신설	금융위, 정책 금융기관	Financial Services Commission, Policy Financial Institutions		
	④ 기업운용사 선정지표에 녹색금융 실적 반영	환경부	Ministry of Environment		
2. 민간금융 활성화	⑤ 녹색분류체계 마련	환경부	Ministry of Environment	초안 마련	시행 적용
	⑥ '금융권 녹색금융 모범규준' 마련	금융위, 금융권 협회	초안 마련	시행 적용	
	⑦ '녹색채권 가이드라인' 시험사업 시행	환경부	Ministry of Environment		
	⑧ 금융회사 '기후리스크 관리-감독체계' 수립	금융위, 금융회사, 감독기관	계획 수립	계획 수립	영향 분석
3. 녹색금융 인프라 정비	⑨ 기업의 환경정보-공시-공개 단계적 의무화	금융위, 거래소, 환경부	계획 수립	계획 수립	법 개정
	⑩ 스톡에드십 코드 개정 검토	금융위	Financial Services Commission		
	⑪ 환경 표준평가체계 마련	환경부	Ministry of Environment	모형 설계	시행 적용
	⑫ 정보공유 플랫폼 구축	금융위 등	Financial Services Commission, etc.		

- (1) Strengthening the role of the public sector
- (2) Establishing a dedicated green financial institution
- (3) Establishing Green Finance Council
- (4) Reflecting green finance performance in company selection index
- (5) Establishing green classification system
- (6) Establishing best standards for green
- (7) Implementing green bond guideline
- (8) Establishing climate risk management financial companies
- (9) Green financial infrastructure maintenance
- (10) Making public announcement and information of a corporate mandate
- (11) Review of Stewardship Code
- (12) Building an information sharing platform

5



Jeonju Government Administration Direction

- Four key policies: ① Great transformation into an eco-city, leading 2050 carbon neutrality ② Advancement of four new growth industries ③ Creating high-tech bio-industry innovation valley ④ Building a foothold to become a metropolitan city
- Four major projects to enhance urban competitiveness: ① Establishing a base as a global tourism base city ② Expanding green area in the city ③ Establishing a city of books ④ Promoting Jeonju's regional regeneration

01 생태도시 대전환, 2050 탄소중립 선도적 추진

Reduction target

- 50% reduction by 2035, realization of 2050 carbon-neutral city
- Reduction roadmap (as of 2017 emission: 5,389 thousand tons CO₂)

Reinforcement of the carbon-neutral system

- Jeonju established 2050 Carbon Neutral Promotion Plan (2021) – 2050 Carbon Neutral Vision Setting, Strategies for Each Area, etc.
- Enactment of the Carbon Neutral Implementation Ordinance (2021)

2050 Carbon-neutral private governance operation

- Jeonju public-private cooperation organization launched (April 2021)
- Comprehensive promotion of the 2050 carbon-neutral task

2050탄소중립 9개 전략

- ① 신재생에너지 확산
- ② 건물 그린 리모델링
- ③ 스마트 신단 조성
- ④ 천만그루 정원도시 조성
- ⑤ 폐기물 저감 및 녹색자원 전환
- ⑥ 로컬푸드 활성화
- ⑦ 시민환경교육
- ⑧ 탄소중립 실행 기반 구축

Raise citizen awareness and spread participation

- Carbon-neutral customized education by stage • Citizens' participation through public-private cooperation

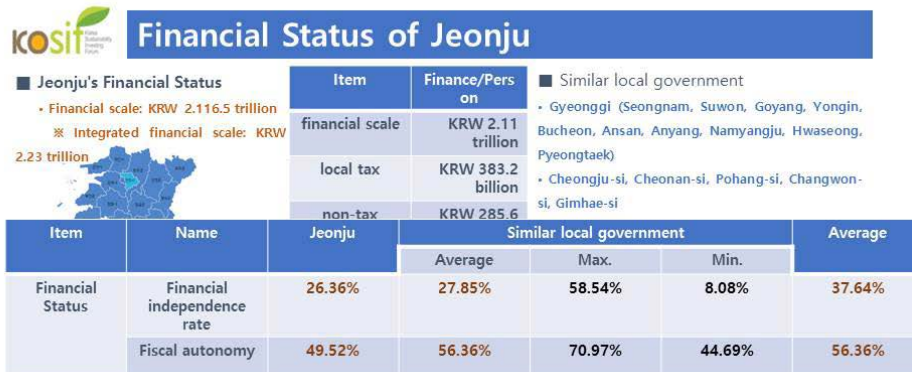
ESG public-private cooperation projects

- Jeonju ESG Cooperation Promotion Team • Jeonju ESG Policy Forum • ESG Management by Jeonju Affiliated Organizations
- Green Purchasing in Public Procurement

9 Strategies for 2050 Carbon
Renewable energy
Green remodeling
Smart Industrial Complex
Urban greenery
Waste reduction and green resource conversion
Local food
Citizen Environmental Education
Establishing the basis for carbon



6



[Figure] Comparison of financial independence rate



[Figure] Comparison of fiscal autonomy



7

KOSIT Status of Jeonju Industry and Emissions Ratio

■ Number of businesses by industry (as of 2018)

- Proportion of the number of businesses by industry: wholesale and retail (26.72%), accommodation and restaurants (17.82%), associations and organizations, and repair and other personal services (12.43%) in order
- Number of businesses by employee size: businesses with 100-299 employees increased

<산업대분류별 사업체수>

(단위: 개, %)

산업분류	사업체수	구성비
전 산업	53,859	100.0
A. 농업, 임업 및 어업	24	0.04
B. 광업	4	0.01
C. 제조업	2,665	4.95
D. 전기, 가스, 증기 및 수도사업	30	0.06
E. 하수·폐기물 처리, 원료재생 및 환경복원업	73	0.14
F. 건설업	2,040	3.79
G. 도매 및 소매업	14,392	26.72
H. 운수업	4,927	9.15
I. 숙박 및 음식점업	9,598	17.82
J. 출판, 영상, 방송통신 및 정보서비스업	388	0.72
K. 금융 및 보험업	740	1.37
L. 부동산업 및 임대업	2,176	4.04
M. 전문, 과학 및 기술 서비스업	1,584	2.94
N. 사업시설관리 및 사업지원 서비스업	1,049	1.95
O. 공공행정, 국방 및 사회보장 행정	120	0.22
P. 교육 서비스업	3,345	6.21
Q. 보건업 및 사회복지 서비스업	2,206	4.10
R. 예술, 스포츠 및 여가관련 서비스업	1,802	3.35
S. 협회 및 단체, 수리 및 기타 개인 서비스업	6,696	12.43
T. 가구내고용활동 및 달리 분류되지 않은 자가소비 생산활동	-	-

■ Greenhouse gas emissions

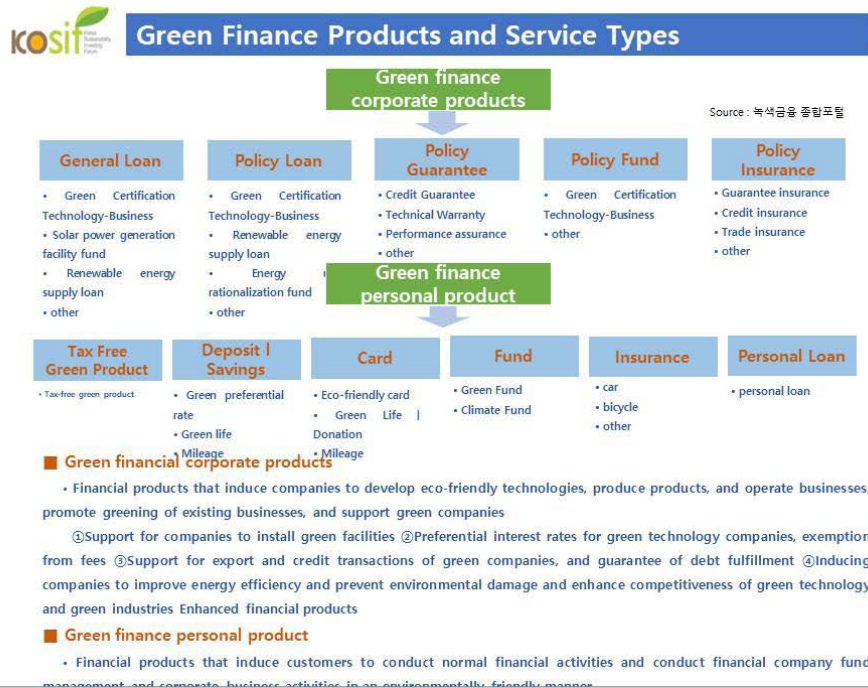
- About 60% share in road transport and commercial sector
- Establishment of eco-transport and energy conversion system, green industry conversion

<산업대분류별 총사자수>

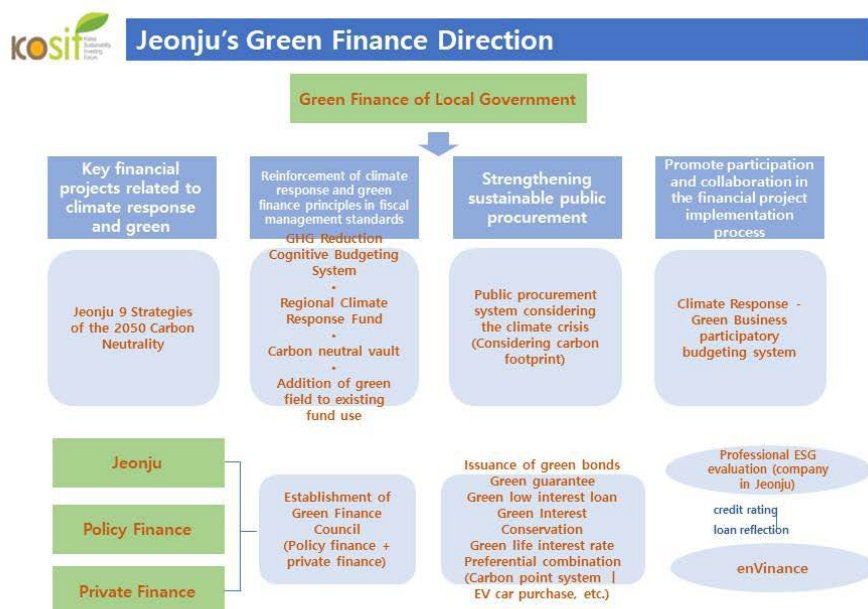
(단위: 명, %)

산업분류	총사자수	구성비
전 산업	247,388	100.00
A. 농업, 임업 및 어업	350	0.14
B. 광업	48	0.02
C. 제조업	13,885	5.61
D. 전기, 가스, 증기 및 수도사업	707	0.29
E. 하수·폐기물 처리, 원료재생 및 환경복원업	1,226	0.50
F. 건설업	23,951	9.68
G. 도매 및 소매업	39,834	16.10
H. 운수업	10,883	4.40
I. 숙박 및 음식점업	29,160	11.79
J. 출판, 영상, 방송통신 및 정보서비스업	3,968	1.60
K. 금융 및 보험업	12,447	5.03
L. 부동산업 및 임대업	7,223	2.92
M. 전문, 과학 및 기술 서비스업	8,756	3.54
N. 사업시설관리 및 사업지원 서비스업	10,763	4.35
O. 공공행정, 국방 및 사회보장 행정	9,403	3.80
P. 교육 서비스업	24,338	9.84
Q. 보건업 및 사회복지 서비스업	30,531	12.34
R. 예술, 스포츠 및 여가관련 서비스업	5,780	2.34
S. 협회 및 단체, 수리 및 기타 개인 서비스업	14,135	5.71
T. 가구내고용활동 및 달리 분류되지 않은 자가소비 생산활동	-	-
U. 국제 및 외국기관	-	-

8



9



10



Carbon Neutral Vault Evaluation Index

Index	Description
Index ①	• Whether or not to declare carbon neutrality internally and externally (organization + financial portfolio) • Establishment of carbon-neutrality implementation plan and public announcement internally
Index ②	• Whether or not an exit plan for existing coal investment has been established and performance results ☞ The exit strategy is to withdraw all existing investment within 2030 (to limit global warming below 1.5 degrees, OECD and EU member countries must phase out coal power plants within 2030. Financial institutions wishing to become members of PPCA, the coal-free coalition) It is stated that financial support should not be provided for coal power plants operating after 2030.)
Index ③	• Participation in international initiatives of climate finance (green finance) and the performance ☞ Criteria for selecting international initiatives related to climate finance: From the point of view of financial institutions, identify what activities are necessary for carbon neutrality of the organization and, in particular, the financial portfolio, and select them based on this ☐ (Necessity of information disclosure) - CDP (Former Carbon Disclosure Project) TCFD (Climate Related Financial Information Disclosure Task Force) ☐ (Necessity of calculating financial emissions) - PCAF (Carbon Accounting Finance Partnership) ☐ (Necessity of setting carbon reduction targets) - SBTi (Science-Based Reduction Target Initiative) ☐ (Carbon-neutral International Cooperation and Solidarity) - Net-Zero Banking Alliance ☐ (De-coal implementation) - PPCA (Coal-Free Alliance) ===== ☐ (Principles and Direction of Banking Activities): PRB (Principles of Responsible Banking) of UNEP FI ☐ (Principles and directions for participation in large-scale development projects): Equator Principles

11

JeonjuGreen Climate Finance Revitalization Plan

Yoon Deok-chan

Who's Good CEO



Sustainable Loan

The International Capital Market Association (ICMA) announced four sustainable bond principles, the Loan Market Association (LMA) announced three sustainable loan principles, and recently announced the standards of the sustainability-linked finance.

Classification	지속가능대출 (Sustainable Lending)	지속가능채권 (Sustainable Bond, ESG Bond)	
Environment	Green Loan Principle (2018.4)	Green bond principle (2014) Climate bond principle (2010)	Sustainability bond Principle (2018.6)
Social	Social Loan Principle (2021.4)	Social bond principle (2017)	
Sustainability	Sustainability-Linked Loan Principle (2019.3)	Sustainability-linked bond principle (2020.6)	

↓
지속가능성 연계 금융
(Sustainability-Linked Finance)

자료 출처 : ICMA, LMA

Who's Good WE SUPPORT SUSTAINABLE FINANCE

1

Sustainability-linked Loan

After the Loan Market Association (LMA) announced the SLLP in March 2019, it updated in July 2021 to clarify KPIs and SPTs. → In the Q1 of 2021, SLL issuance tripled (USD 87 billion, KRW 97 trillion) from the same period last year

Sustainability-linked Loan

- 1) Select key performance indicators (KPIs)
- 2) Establishment of Sustainability Performance Targets (SPTs)
- 3) Loan characteristics
- 4) (Post) Reporting
- 5) (Post) Verification

SLL means any type of loan that encourages borrowers to achieve ambitious sustainability performance targets (SPTs) set in advance, which aims to promote environmentally and socially sustainable economic activity and growth through SLL. Therefore, the SLL verifies whether the sustainability of the borrower improve over the loan term. Clear definitions of key performance indicators (KPIs) should be provided: (i) indicators related to the borrower's sustainability issues and strategies and having significance; (iii) indicators using measurable or quantitative methods; and (iv) benchmarkable indicators for comparison.

Borrowers are required to clearly communicate and agree on key performance goals and sustainability performance targets with lenders (banks)

SPTs for each KPI must be compulsorily verified/reviewed by an external evaluator when ex post facto reporting (at least annual).

By actively providing capital to companies implementing strong sustainability strategies, lenders encourage and support improving sustainability.

Status of SLL in Q1 2021

Reuters reported that it is also becoming a trend for private equity funds to adopt ESG-linked loans or sustainability-linked loans (SLLs).

The amount of ESG-linked loans in the Q1 of this year reached USD 87 billion (about KRW 97 trillion), which has tripled compared to the same period last year.

Leveraged Loan is a representative example. The issuance of ESG-linked leveraged loans until May of this year amounted 1.9 billion euros (about 2.5 trillion won), a 14-fold increase from the same period of the previous year. ESG-linked leveraged loans can lower borrowing costs by 0.05~0.15%p when the target is achieved.

For a recent instance, the global private equity fund Carlyle was offered a loan by Blackstone Group lending arm in which the interest rate drops if Acrotec hits sustainability targets such as limiting its energy usage and recycling more. Blackstone also required an independent ESG evaluation by an external company in accordance with the SLL principle to verify that they achieve their goals

As such, ESG-linked loans are becoming a trend not only for banks, but also for loans that provide sustainability (ESG) goals and take non-debt-related interest which may come up with slightly lower interest rate.



자료 출처 : LMA/APLMA/LSTA, Osborne Clarke, LMA, Reuters

Who's Good WE SUPPORT SUSTAINABLE FINANCE

2

Sustainability-linked Bond

In June 2020, ICMA announced the Sustainability-Linked Bond (SLB) Principles that link bond yields to sustainability targets. Unlike GBs, which are targeted at specific projects, SLBs can be used for any purpose, broadening the scope of issuers.

Sustainability-Linked Bond

- 1) Select key performance indicators (KPIs)
- 2) Calibration of Sustainability Performance Targets (SPTs)
- 3) Bond characteristics
- 4) Reporting related information
- 5) (Post) Verification

Select key performance indicators: (i) significant indicators relevant to the issuer's sustainability issues and strategies; (ii) three-year indicators included in the last annual report or at least externally verified; (iii) selected indicators use measurable or quantitative methodologies; (iv) benchmarkable indicators for comparison

Calibration of Sustainability Performance Targets: (i) consistent with the issuer's sustainability/ESG strategy; (ii) one or more SPTs by KPI; (iii) science-based targets (SBT) or official government/global goals (Paris Agreement, SDGs); (iv) comparable to benchmark/external reference standards; (v) Second Party Opinion issuance or baseline verification is encouraged.

Bond characteristics: (Mainly use coupon rate) The interest rate is linked with SPTs (set-up coupon) and the rate rises if SPTs are not achieved.

SLB issuers are required to be verified/reviewed by an external evaluator when ex post facto reporting (at least annually)

SLB allows to raise funds for general corporate purposes, but at the same time, it promises to pay investors extra expense if sustainability targets such as mitigating carbon emission are not met.

Status of SLL in Q1 2021

- Green > Social > Sustainability > SLB > Transition

The volume of SLB issuance is significantly increasing!
FYI, from early 2020, the size of social bonds increased in order to support small businesses struggling with covid-19 measures .



자료 출처 : SLBP, ICMA, NN Investment Partners

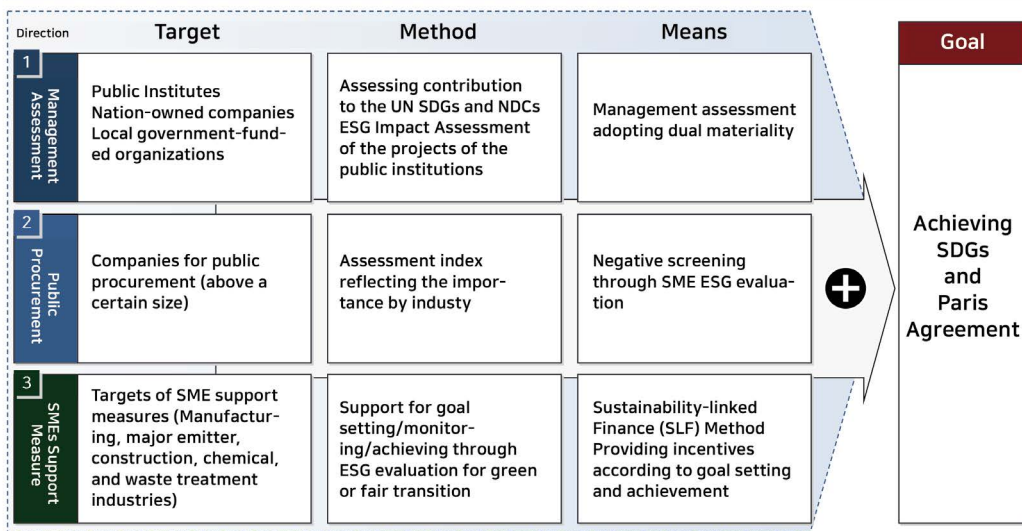
Who's Good WE SUPPORT SUSTAINABLE FINANCE

3

ESG Utilization Measures for (Local) Governments

The key is to use ESG as a fashion to reduce risk and support reorganization or transformation of business models so that many companies can participate in the transition to a low-carbon economy.

ESG integration directions and goals for central and local governments



Exploring social economy–based climate finance and green fund for Jeonju to solve regional issues and accelerate green transition

Lee Jung-hyun

Korean Federation for Environmental Movement Vice President

- For transition to the society of net neutrality in the era of climate crisis, the roles of climate fund are critical as it serves as the foundation for the technology of green new deal, carbon economy based on the idea of free market, green technology, basic income, and expandable renewable energy.
- However, looking at the policy proposals contained in '2050 Net Neutrality Scenario*¹' unveiled by the Moon administration, climate fund is not clearly explained and no more than a declaration (The plans for the 2021 green finance by the FSC and MOE cited in the statement identified 12 implementation tasks for <2050 Carbon Neutrality Implementation Strategy> but still lack specialized strategies and tasks for local regions).
 - * Support for facility investment to improve industry process energy efficiency (low-interest loan, financial subsidies, and tax breaks)
 - * Encourage net neutrality by strictly controlling total allowed permissions of cap-and-trade, but create virtuous circle of re-investing proceeds from auction
 - * Encourage voluntary GHG reduction by businesses through green classification system and green finance and create favorable investment environment
- As green new deal focuses on growth such as reorganizing industry system and job creation, it stresses helping large companies enhance competitiveness such as RE100, cap-and-trade, and carbon border tax. ESG management at large companies and financial investment agencies and investment in climate fund are growing very fast.
- In the meantime, initiatives in the realm of social economy such as 'mutual aid-based fundraising for climate aid'¹⁾ for post-growth and local economy, and private-public cooperation in response to climate change appear to be slow. Climate fund and climate finance based on regions are still in the stage of concept presentation.
- Climate finance has a far-reaching implication for net neutrality and energy transition by the capital-intensive strategy of institutional finance. However, it may come with limitations depending on proceeds generated. To complement, solutions must be sought locally.
 - For instance, they can be sold like poor-performing securities (Jeonju Citizens' Sunshine Power Plant started with a 4% dividend but it appears hard to achieve the promised yield due to condition changes. Gunsan Citizens' Power Plant offered a profit as high as 7% but should change the plan. They ended up as no more than another investment project)
 - In this regard, it is necessary to actively use the existing network and structure of cloud funding, social finance, alternative currency, climate mutual aid, and credit association, and depart from the capitalization strategy which ended up as green finance of derivatives in the institutional finance.

1) Green New Deal and Policy Report on Climate Finance (Shin Seungcheol-Biological Wisdom Research Institute Co-op) (Park Sukhyun-Sustainable System Research Center)

- The climate fund, which has recently raised the question over whether it is another financial derivatives based on the growth idea, can be discussed in the context of regional currency or alternative currency like the Pig Card (local pre-paid card, distributed from disaster relief subsidy center), if it is to become effective.
- Local currencies and local gift certificates are very popular. Disaster relief subsidies were distributed with Pig Card (156,000, or 24% of citizens applied for the card in six months)
- Jeonju's Pig Card is a pre-paid debit card exclusively available in the region. However, users feel that they are contributing to promoting local economy by paying with the card. As such, local currency connected with climate fund can help spread the values of citizen participation.
- Local climate fund should be connected with local banks and investment option should be created for such purposes. Ways should be sought to engage citizens in raising climate fund which can work locally.
- Climate fund to be institutionalized by the central government has the potential to be a large resource considering the financial market trend. Renewable energy cluster and energy transition can also become the biggest investment target and the center of fund management.
- Investment targets of such large funds such as Saemangeum and Gunsan is home to small champions with different carbon reduction portfolio. They are critical as carbon absorbers as well. However, eco-friendly farming, basic income for farmers for organic cattle raising, zero-waste, vegan, and new youth movement should become the center of local climate fund and project areas.
- Jeonju is implementing the 2021 『Subsidy for Loan Interest of Solar Power Generation Facilities』 to reimburse part of the cost of power generation facilities. The budget is KRW 50 million with a 2% interest but expected to contribute to promotion.
- Jeonbuk Bank paid a total of KRW 4.34 billion in collaboration project budget to 13 local governments for the local vault operation. Of the 13 local governments, only Jeonju is the primary vault and the rest governments are secondary vault. Last year, it won the bid to operate the primary vault for Jeonju city again, contributing KRW 20.5 billion for the next three years. It contributed KRW 1.4 billion for the secondary vault of Jellabukdo, accounting for 78.9% of the total contribution of the two local governments.
- Provincial vault is a subsidiary of Nonghyup which has a higher proportion of coal investment. It will promote local economy and expand local climate financial derivatives. The use of contributed money can be reserved for supporting the class who are vulnerable to climate change or citizens campaigns.

Now here are questions based on the above views.

- What are the forms of climate fund or climate financial products connected to participation-based profit sharing renewable energy project such as Citizens' Sunshine Power Plant, carbon welfare as a measure for climate crisis adaptation for low-income class, or support for citizens' movement such as Climate Change Emergency Action?
- Please introduce if there are green fund which can be tried by small champions, root companies, agricultural industry, or young local people, and is there a way to circulate personal product in local economy (turn proceeds into capital)?
- Please share us with your tips on how to encourage people's participation in climate finance and climate mutual aid and expand social economy for local virtuous circulation.

Jeonju's ESG Initiative

Noh Eun-young

Jeonju City Department of Future Strategy Innovation Director

1 Introduction

The global community and the central government's interest in the climate crisis and the environment gradually picks up due to COVID-19 pandemic. As the peripheral role is emphasized, the role of local governments, which practically implement related measures by combining local citizens, businesses, and administration, is becoming more important. In order to overcome the climate crisis and become a sustainable city, Jeonju introduced carbon neutrality and ESG (environmental, social, governance) in its decision-making process, and is looking for ways to expand ESG management in the private sector along with eco-friendly utilization of existing financial resources.

2. Introducing carbon neutrality and ESG in decision-making process of the public sector

Carbon neutrality and ESG must first be introduced in the decision-making process of the public sector to become foothold of the private sector and to provide meaningful support measures based on this experience. In particular, Jeonju has both experts from various fields and citizens who are interested in the climate crisis. Their voices will help Jeonju to quickly introduce carbon neutrality and ESG from the public to the private sector.

- Establishing the Comprehensive Climate Change Response Plan for Carbon Neutrality by 2050
Jeonju declared that 2021 would be the first year of carbon neutrality to reduce greenhouse gas emissions by 50% by 2035, and realize a carbon-neutral city by 2050 through the Jeonju 2050 Carbon Neutral Declaration on April 22. Starting with the declaration, a comprehensive climate change response plan is being established for systematic implementation. Jeonju plans to analyze the current climate change in the city, establish goals and strategies that are appropriate for them to implement practical measures. In particular, in the planning stage, Public-Private Governance for the Realization of 2050 Carbon Neutrality, which everyone from environmental group activists and experts to the general public participates, will be established to reflect various opinions and build decision-making systems.
- Operating ESG Cooperation Promotion Team
It is very important to support and open a forum for ESG, which is essential for preparing for the climate crisis along with carbon neutrality, rather than directly introducing it to the public sector. To this end, Jeonju has formed and is operating an ESG Cooperation Promotion Team made up of experts in each field, including universities, civic groups, enterprises, economic groups, and administration. Through monthly advisory meetings, they play a role of discovering and promoting cooperative projects, proposing and consulting on ESG-related policies. Also, the team plans to build a network of civic groups, enterprises and local governments.

○ Hosting ESG and Public–Private Cooperation Policy Forum

Last May, to spread ESG citizen awareness, for the first time, a forum was held under the theme of 'Finding policy measures to promote public–private cooperation from the perspective of ESG with public interest'. The second forum was held under the theme of 'Seeking'. About 100 citizens and officials from public institutions, including businessmen belonging to the Jeonju Association of Small and Medium Enterprises, participated online and offline, and a meaningful event was prepared to listen to the presentations of experts and exchange opinions. The city will continue to hold forums to promote the practical application of ESG in the public sector, the private sector, and the lives of citizens.

3. Expanding ESG Wave

ESG was introduced to create a sustainable society. In order to create a sustainable society, ESG, which is implemented in the decision–making process in the public sector centered on Jeonju, needs to be expanded to the local communities. ESG is being introduced from the city–affiliated organizations of Jeonju to universities and local businesses that play a major role in the local community.

○ Introducing ESG management in the city–affiliated organizations

In Jeonju, there are 6 city–owned companies and city–funded organizations, including the Jeonju City Facility Management Corporation and the Jeonju Food Integration Support Center. ESG is going to be introduced to these organizations first since there is a limit to directly introducing ESG management to the public sector. Complying with the Ministry of the Interior and Safety's 'Proposal Model for Evaluation of Management Performance of Locally Invested and Funded Institutions', the organizations will seek for a promotion plan based on the decisions of internal board of directors after forming a consensus on the need for ESG with the directors and employees.

○ ESG Management Business Agreement between Jeonju and Universities

To introduce ESG management and spread the ESG ecosystem for the sustainable development of the region, a business agreement was concluded with a total of six universities in Jeonju on Sep. 18th. It aims to promote business cooperation and publicity for the expansion of ESG management, and a working–level council for the networking.

○ "Using My Tumbler" campaign to practice carbon neutrality in daily life

A trial "Using My Tumbler" campaign is promoted at about 20 cafes near the city hall frequented used by the city officials. It's about carrying a tumbler and leaving a spare tumbler at a cafe so that they can use that tumbler for takeaway. Jeonju plans to develop a tumbler sharing service app and expand it as a "Tumbler Sharing Project." It is expected to create jobs by linking the cleaning and disinfection self–support business.

4. Eco–friendly Utilization of Existing Financial Resources

Rather than investing new financial resources, we need to utilize existing resources. By correcting the wrong spendings and making public procurement and contract, the trickle–down effect can initiate green consumption of the private sector.

- Increasing Green Product for Public Procurement

First, Jeonju is increasing the purchase of green products, such as eco-friendly and recycling certified products. A pilot project is currently being carried out in order to prevent reverse discrimination such as increasing burden on local businesses and weakening competitiveness. The city is looking for complementary and support measures so that local companies can increase producing green products.

- Introducing good consumption evaluation for the subsidy-awarded organizations

As for subsidies, which are public sources of funding, "Jeonju good consumption pledge" will be promoted for various organizations receiving subsidies so that they can participate in the spread of carbon neutrality and ESG. Good consumption is to purchase goods or services in consideration of ESG values such as environmental and social impacts. When subsidy is awarded, the organizations will be involved in the pledge to spread ESG.

5. Conclusion

Jeonju aims to become an ESG leading city by building an ESG platform centered on public-private cooperation.

Rather than suggesting and participating in, Jeonju will focus on creating a playing field for expanding ESG and putting its efforts to make policies to establish a sustainable city. I hope that the International Conference on the Economics of Happiness will be a place to share diverse and useful opinions on what one can do to overcome the climate crisis and create a sustainable society.

CHAPTER 5

SESSION 3

Job policy in response to the climate crisis

- The Post-Growth Transition: What about Jobs?
| **Jason Hickel**
- Climate change and job crisis, community-led jobs
| **Oh Ki-Chul**
- Job policy in response to the climate crisis
| **Lee Yu-jin**
- Jobs Responding to Climate Crisis in the Region
| **Seo Nan-yee**
- Climate Crisis and Employment Policy
| **Bae Kiu-sik**

Session 3

Job policy in response to the climate crisis

■ Program Order ■

Time (Min)	Program	Details
16:10~16:12 (2')	Opening	Opening remarks, Topic Overview and Panel Introduction, Introduction of Guests, Housekeeping notes
16:12~16:42 (30')	Speak 1	The Post-Growth Transition: What about Jobs? Jason Hickel
16:42~16:57 (15')	Speak 2	Climate change and job crisis, community-led jobs Oh Ki-Chul
16:57~17:12 (15')	Speak 3	Job policy in response to the climate crisis Lee Yu-jin
17:12~17:27 (15')	Speak 4	Jobs Responding to Climate Crisis in the Region Seo Nan-yee
17:27~17:42 (15')	Speak 5	Climate Crisis and Employment Policy Bae Kiu-sik
17:42~18:10 (28')	Result Sharing	Free Discussion and Result Sharing

The Post-Growth Transition: What about Jobs?

Jason Hickel

Professor London School of Economics

Let me open by first thanking the organizers for inviting me to join you today. I hope that this intervention will provoke an interesting and useful debate.

I want to use my time with you to put forward what I think is a crucial but also challenging idea. I will argue that we must fundamentally transform the nature of the economy – and fundamentally rethink the notion of work – if we want to have any hope of reversing the ecological crisis. Indeed, this is key to the possibility of creating a just and ecological society.

First, let me briefly describe the stakes of this question. As you already know, we are presently facing a crisis of ecological breakdown. Global heating has now hit about 1.1 degrees, and the consequences are already devastating: extreme storms, deadly heatwaves, wildfires, droughts, crop collapse and human displacement. And this is just the beginning. On our present trajectory, taking account of the existing policies promised by the world's governments, we are headed for 3 degrees of global warming in the coming decades, during my lifetime.

What does 3 degrees look like? At this level of heating, scientists tell us that 1.5 billion people will be displaced, 30–50% of species will be wiped out, and yields of staple crops will decline by 30% on average, triggering what the United Nations refers to as "multi-breadbasket failures" and "sustained food supply disruptions globally". Significant chunks of the tropics will become virtually uninhabitable for humans. Such a future is not compatible with organized human civilization as we know it. We must take dramatic action to preclude such a future.

And climate change is not the only crisis we face. Human economic activity is also overshooting several other planetary boundaries, including in terms of habitat destruction and biodiversity collapse, which is being driven by excess resource use – in other words, all the material stuff that we extract and produce and consume. The rate of extinction is already 100 to 1,000 times faster than prior to the industrial revolution. If we continue on this trajectory, more than 1 billion species are at risk of extinction in the coming decades.

People have a tendency to think of ecological breakdown in terms of "the Anthropocene". Clearly this language is useful for certain purposes, to highlight the role of humans. But it is also incorrect. It's not actually humans as such that are causing this crisis; rather, it is a global economic system, capitalism, that is organized around, and dependent on, ever-increasing levels of commodity production and consumption, which we gloss as "growth."

Now, this might not be a problem if growth was just plucked out of thin air. But in reality there is a strong relationship between economic growth and material and energy throughput. The more we grow, the more resources and energy we use. This is what's driving ecological breakdown.

Crucially, this is only a problem when it comes to high-income countries. High-income countries,

including Korea, have extremely high levels of resource use and energy use, vastly in excess of sustainable levels, and also in excess of what is required to meet human needs, even at a high standard. For instance, high-income economies use on average 28 tons of material resources per capita per year. This is four times over the maximum sustainable level. In other words, if all nations consumed like high-income nations, we would need four planets to sustain us.

Meanwhile, poorer countries in the global South remain well within sustainable levels, and indeed in many cases need to increase their use of energy and resources in order to meet human needs at a good standard. We must be clear on this fact: richer countries are overwhelmingly responsible for causing this crisis.

[show slides]

In Western Europe and the rest of the OECD, including in Korea, the dominant response to this problem is to try to make growth "green". We can keep pressing on the accelerator of economic growth so long as we can manage to decouple GDP from resource use and emissions. To do this, we can roll out renewable energy capacity to reduce emissions, and invest in technological innovation to improve resource efficiency. This vision of green growth is sold as having the added benefit of creating thousands of new "green jobs".

The promise of green growth has been around since the 1970s, always claiming that salvation is just around the corner. It was repackaged in 2012 by the World Bank and the OECD. In the European Union, it features centrally in the Green Deal framework. And in Britain, politicians have billed the idea as the "Green Industrial Revolution".

It may sound wonderful, this notion that we can keep the status quo of capitalist growth more or less intact, with a few tweaks around the edges. But this vision suffers from serious conceptual and empirical flaws.

First, high-income nations cannot reduce their emissions fast enough to stay within the carbon budget for 1.5C or 2C while pursuing growth at the same time. The reason is because growth is coupled to energy use, and the more energy we use the more difficult it is to transition the energy system to renewables in the short time we have left. In other words, growth makes it more challenging to achieve our climate goals. And indeed, this is why we are failing to make any significant progress. Climate scientists are clear that, in the absence of speculative negative-emissions technologies, meeting the Paris Agreement targets will require rich countries to actively reduce their energy demand.¹⁾ This requires abandoning growth as an objective.

Even if this was not a problem, we still have to face the question of resource use. There is zero evidence that growth can be absolutely decoupled from resource use, even under high-efficiency conditions. The reason is because in a growth-oriented economy, efficiency improvements are leveraged to expand the process of production and consumption, which ends up wiping out most of the gains. There is a strong consensus on this in the scientific literature.²⁾ So, here again, if we want to reduce resource use in absolute terms, we must abandon growth as an objective.

1) Hickel, J., Brockway, P., Kallis, G., Keyßer, L., Lenzen, M., Slameršak, A., ... & Ürge-Vorsatz, D. (2021). Urgent need for post-growth climate mitigation scenarios. *Nature Energy*, 6(8), 766–768.

2) Hickel, J., & Kallis, G. (2020). Is green growth possible?. *New political economy*, 25(4), 469–486.

Finally, the notion that growth of any kind – green or otherwise – will solve the problem of unemployment and livelihoods simply does not hold up. Growth never solves unemployment. It doesn't matter how much you grow, the unemployment rate never goes to zero. Under capitalism, unemployment is constantly produced anew. This is because of the "productivity trap". Productivity is constantly increasing, which produces unemployment, and in order to solve unemployment we believe we must grow the economy to create more jobs and absorb unemployed workers. But it is a temporary fix and the problem is never ultimately solved: more productivity always produces more unemployment.

The problems with the green growth narrative are exemplified by Korea. In 2009, Korea adopted a green growth policy platform, and over the past decade analysts have been watching carefully to see what the results look like. Unfortunately, the outcomes have not been good. Per capita resource use and emissions have both increased in consumption-based terms, by roughly 30%. In other words, Korea's green growth programme has failed. Furthermore, all of this growth has not solved Korea's unemployment: indeed, unemployment has been rising steadily since 2013.

So, let me sum up so far:

- 1) Meeting Paris targets and avoiding catastrophic ecological breakdown cannot be accomplished if high-income nations continue to pursue economic growth as usual.
- 2) Growth does not permanently reduce unemployment.
- 3) Green growth promises have no empirical grounding, and also have failed to deliver reductions in ecological impact and in unemployment. Korea is an example of this.

In light of this evidence, ecological economists call for a fundamentally different approach. High-income countries need to abandon growth as an objective and shift to post-growth models. Post-growth policies are designed to keep economies stable and support strong social outcomes without growth. This would enable us to reduce excess energy and resource use and thus make it much easier to achieve rapid decarbonisation, fast enough to stay under 1.5C, while reversing ecological damage.

The principle here is quite straightforward. Right now we assume that all sectors of the economy need to grow, all the time, regardless of whether or not we actually need them to. Clearly, in an era of ecological crisis, this is not a reasonable approach to managing the economy. Instead, we should decide what things we actually want to improve (things like public transportation, renewable energy, etc.), and what sectors are clearly destructive and should be scaled down: things like SUVs, private jets, air travel, private cars, industrial beef, advertising, fast fashion, the military industrial complex, planned obsolescence, and so on.

Most people would see this approach as quite sensible. Indeed, clearly our lives would be better under such a scenario. Except for one sticking point. What about jobs? If we scale down unnecessary industrial production, won't that lead to unemployment? Indeed, the spectre of unemployment keeps us all lining up shouting for more growth, because we believe that more growth is necessary to ensure jobs and livelihoods. We even find it difficult to contemplate closing down things like coal mines, because of the impact it might have on employment. This is why governments have come under pressure to bail out oil companies and airlines in the middle of a

climate emergency – to prevent the chaos of mass layoffs.

But there is another way. As the economy needs less labour, we can shorten the working week to share necessary work more evenly, thus preventing – and indeed permanently ending – the problem of unemployment. What's exciting about this approach is that we have strong data showing that shorter working hours lead to significant improvements in people's well-being. It reduces stress and anxiety, it reduces commuting, it reduces gender inequality in the home, it reduces mindless consumption, and it reduces emissions and resource use. It also frees us to spend more time doing what is valuable and meaningful, such as caring for our families and communities.

At the same time, we need to distribute income more fairly. People often ask whether in a degrowth scenario there will be enough income for people to buy what they need. The answer is yes, by definition. Remember, income is simply the mirror image of the total price of the commodities produced in the economy. There is, by definition, always enough income to buy the things the economy produces. So as long as we are producing things that people need, there will always be enough income for everyone to live well. What matters is distribution.

To ensure a fair distribution of income, we can introduce strong living wage policies, pegged to the month rather than to the hour, to accommodate changing working hours. And just as we have a policy on minimum income, we can have a policy on maximum income, and introduce a wealth tax, recognizing that over-accumulation by elites is bad for the environment, bad for society, and bad for democracy. Excess consumption by rich people is a major driver of emissions and resource use. You cannot simply ask rich people to consume less; their consumption is an effect of their income! The only reasonable approach is to tax them to the point where they are no longer rich, to bring their consumption down to sustainable levels.

Finally, we need to expand public services, including high-quality, universal public healthcare, education, public transport, housing, water, energy and internet. This approach is key to ensuring that everyone has access to the resources they need to live good lives, without needing ever-rising incomes in order to do so. This approach removes the pressure for additional growth. Some will say that we need GDP growth in order to tax income and fund public services, but this view is incorrect. Any government that controls its own sovereign currency can issue that currency to fund public services directly, as Modern Monetary Theory proposes. For those that cannot, progressive taxation of the rich can do the job just as well.

Toward this end, we can introduce a public job guarantee program, as proposed by economists like Stephanie Kelton, Pavlina Tcherneva and a growing chorus of others. The idea is that anyone who wants to can train to do dignified, socially useful work, paid at a living wage. The power of this approach is that it can be used to mobilize the labour that's needed for the ecological transition. There's a lot of work to be done, and it needs to be done quickly. We need to ramp up renewable energy capacity, installing solar panels, wind turbines and batteries. We need to retrofit houses to improve insulation and replace gas boilers. We need to restore degraded ecosystems, plant forests, and rewild land. We need to expand public transportation networks. And we need to shift to regenerative farming methods to restore soils and biodiversity, sequester carbon, and provide healthy, local food.

All of this requires labour, and it's not going to happen on its own. We need a public program, run both at a national level (for big projects like railways, power lines and national forests) as well

as at a decentralized community level (to meet specific local needs). This would give people real skills and empower them to contribute to the most important collective projects of our generation, building an eco-social society. This is the opposite of what David Graeber called "bullshit jobs". Of course, at the same time we should ensure that there is a basic income for those who cannot work or who for whatever reason choose not to.

If the jobs programme pays a living wage, this would set a standard that the rest of the economy will have to follow. Private firms would have to pay living wages too – and would have to offer equally enriching work – if they want to retain staff. Why would anyone agree to flip burgers at McDonald's for poverty wages when they could make a real living doing something more meaningful and important? This would also strengthen the bargaining power of labour, and therefore go a long way to reducing inequality. We can also use the jobs programme to shorten the working week. If we set hours at 30 instead of the usual 40 or 50, private employers would be under pressure to follow suit. The jobs programme can be used to adjust the length of the working week as needed.

This is a much more rational, ecologically coherent way to address the present crisis. Trying to grow the economy in order to create jobs is effectively make-work. Almost by definition, jobs created this way are in industries that we don't really need to expand. A job guarantee does the opposite: it mobilizes labour and resources around things that our communities – and ecology – actually need, and which the private sector is unlikely or unable to provide.

It also happens to be astoundingly popular. A YouGov survey found that 72% of people in Britain support the idea, and even in the United States it polls as high as 69%. Better yet, it is not expensive to implement. Drawing on data from the Levy Economics Institute, Tcherneva reports that rolling out a Job Guarantee in the United States would cost only about 1% of GDP, and it could be funded with the very same mechanism that governments are presently using to bail out corporations and prop up stock markets: quantitative easing, but this time for people and planet.

The power of the job guarantee is that it takes the question of employment and livelihoods off the table. It cuts through the Gordian knot, and allows us to have an open, democratic conversation about scaling down ecologically destructive and socially less necessary parts of the economy, without worrying about the spectre of unemployment, while ensuring that affected workers can retrain for jobs in a better, cleaner, fairer economy, without skipping a beat. This approach also reduces the social imperative for growth. Right now, politicians, and even union leaders, line up to call for more growth because they believe it is the only solution to unemployment. The job guarantee would liberate us from the straightjacket of growthism and free us to build an economy that's organized around human well-being and ecological regeneration, rather than around perpetual expansion.

So, let me sum up by putting it this way.

The problem with the existing capitalist economy, including in Korea, is that we have extraordinary industrial capacity but it is organized around production not in order to meet human needs, but in order to facilitate ever-increasing capital accumulation and elite consumption. As a result, we use an extreme amount of resources and energy, with extreme ecological impact, and yet people still live in poverty. We need urgently to transition to an eco-social economy, where production is focused on meeting everyone's needs at a high standard, while reducing forms of production that are not in fact necessary for a good society.

Kore is in a good position to adopt these ideas, because unlike the USA and other neoliberal economies there is an understanding of the important role that state-led industrial policy can play. The key thing now is to realise that such policy should not be organized around growth for its own sake, but should be organized rather around human needs and ecological stability.

I realise that this is a challenging idea. But it is time we stop deceiving ourselves that we can make capitalist growth "green". It is time for a different approach, and the sooner we take this path, the better chance we have of survival.

Climate change and job crisis, community-led jobs — on global cases

Oh Gi-Chul

Greenasia Permanent Director

1. Job crisis connected with climate crisis

Climate crisis has been happening very fast in the past three years. The WMO said that the average global temperature rose by 1°C in 2018, and by 1.25°C again this January. It rose by 0.25°C in just two and a half years. This is causing climate emergencies.

As climate crisis accelerates, so do climate responses in the globe. The Biden Administration, which took power in 2021, is accelerating the shift to post-carbon society. The EU announced Fit for 55 on July 14th aimed at reducing GHG by 55% by 2030. The EU went on to unveil CBAM to be ready in 2023 and to be launched by 2026. The US presented carbon border tax to the Congress to be enforced in 2024. China and Japan will likely follow suit. The era when carbon is not free is coming.

But what if we fail in the shift to post-carbon society? Here are some examples. The Climate Summit was held by the US attended by 40 world leaders on April 22nd. President Moon declared at the meeting that Korea will stop providing financial support for the export of new coal power plants.

But the problem is, President Moon's declaration immediately affected the 340 companies working to export two new coal power plants to Indonesia. Banks suspended low-interest loan.¹⁾

How will the post-carbon order take shape and impact Korea following the Climate Summit on April 22nd?

First, the coalition between the US, China, EU, and Japan will cooperate to secure the lead in clean technology, standard, and green finance, while demanding other countries to cut down on GHG and form climate clubs with countries that agree. If not, what awaits is stringent carbon border tax.

Second, the G7, which President Moon was also invited on June 13th, announced the Communique, declaring to suspend subsidies for fossil fuel by 2025. They also said that they would share the Communique with other countries around the world. Our government would choose to accept this because we are dependent on import. Then not just will coal industry collapse, but we would have to give up gas power generation. Carbon Tracker, the UK think tank, says that the amount of stranded asset will be \$106 billion in coal plants and \$60 billion in gas power plants.

1) Ministry of Economy and Finance hurriedly resumed loans to those companies on May 20th. However, it did nothing to facilitate shift to post-carbon, but barely resuscitated their very survival. (Impact on, 2021.05.20.)

Steel, cement, and petrochemical companies in Korea which depend on fossil fuels are already growing concerned about carbon border tax to be introduced in 2023 in by the EU and in 2024 in the US. But none of them have measures since they haven't been doing anything in response. To be sure, high-carbon industry of Korea is in crisis.

Here is the scenario. Post-carbon shift arrives out of nowhere. Companies unprepared for it go down, so do the lives of workers and their families in the industry. Severe job turmoil shocks the whole country. Communities that depended on the industry and the workers end up in crisis. Government without measures is in crisis too.

Failure in climate action is seriously adding to the uncertainties surrounding Korea along with Covid-19 and economic crisis.

2. Path of capital: Has capital really found the solution to climate change?

What solutions has the global capital found in response to climate crisis?

The great capital is developing a vaccine to lead us to decarbonization in the era of climate crisis. It is a rediscovery, rather than a newly developed vaccine. Global capital of Apple, Google, Tesla, and China has found four solutions to climate crisis: 1. clean energy; 2. ESS, or battery; 3. EV; and 4. green hydrogen.

Why is it a rediscovery? Wind farm, EVs, solar power, and battery have been around for long but they were expensive and uneconomical. However, as their prices fall and demand rises, capital has found a breakthrough and rediscovered that those four solutions can bring them money.

The four solutions that capital has found are very well known. Some even see this path as the only breakthrough for climate crisis. But is it really a breakthrough?

First, whether EVs or batteries, we must be able to pay to buy them. According to the survey by 'Naomi Klein', the author of *On Fire*, you have to make \$25,000 or more a year to afford them. That's top 6% of the people on Earth. So, the path of capital seems to be the liberty enjoyed by the top 6%. Then, how about the remaining 94% who can't afford?

Second, energy analyst Vaclav Smil says that the energy transition which depends on technology progresses so slowly due to energy inertia.²⁾ Furthermore, according to the *Statistical Review of World Energy* released by BP in January 2020,³⁾ fossil fuels account for 85% of the global energy while renewable energy takes up 5%. In the same report released 30 years ago, fossil fuel accounted for 88% in the 1990s and 87% in 2010. The difference over the three decades is a paltry 3%. As evidenced by Vaclav Smil, energy transition is happening too slowly.

Given that the only top 6% of the population is saved by the four solutions discovered by the great capital and the pace of shift through the green technology developed as the climate vaccine by the great capital is too slow, we will have to find another path to navigate climate crisis.

2) Meet Vaclav Smil, the man who has quietly shaped how the world thinks about energy By Paul Voosen, 2018, 5,21

3) Statistical Review of World Energy 2020

3. Path for citizens: What is the solution to climate crisis and jobs through citizens' community?

Do 'citizens' path' or 'path for citizen community exist for the capital's path?
Let us rediscover the path for the citizen community.

Why the rediscovery? When climate crisis brings about change to the system that supported society, way of thinking, way of behaviour, industry, trade, and finance, it is citizens, workers, farmers, fishers, self-employed, and SME owners who bear the brunt. They are the vulnerable citizens and communities. Citizens should rise up to climate crisis.

1) Biden's climate measures: Invest 40% of climate budget into citizen communities

First and foremost, we need to learn from the Biden administration. Biden's government had to return the help by citizens who helped his election. In the late March, the Biden administration proposed a \$2.25 trillion job plan to fight climate change, so-called the Infra Plan. Over 40% of the budget would be spent for climate victims. \$400 billion would go for the care service for the elderly, and \$200 billion for energy efficiency improvement and house remodeling for low-income people. The plan was crafted to use money for vulnerable communities. This is how we find the path toward the transition through citizens' participation.

2) New York State's Green New Deal, the goal of climate leadership is to protect community

Where did the idea of 40% for citizen communities in Biden administration's budget come from? It originated from the Climate Leadership and Community Protection Act enacted by the New York State.

In 2014 when New York Governor Cuomo tried to pass climate change act exclusively aimed at reducing GHG, civil groups and organizations which supported them⁴⁾ launched campaigns and held protests.

The Latin community which was affected by the hurricane 'Nancy' caused by climate change claimed that low-income people in the black community should get the direct benefits and demanded social inequality be addressed.

The majority of New York congress in 2014 was conservatives and Cuomo was on their side. However, the voices persistently raised by citizens over the five years caused the New York congress to turn progressive. Finally, the Climate Leadership and Community Protection Act was enacted in June 2019. New York State allocated up to 40% of the budget for climate citizen communities and protected it by law.

New York State government does not execute the law itself. An independent governance organization called 'Climate Action Committee' does.

New York State's climate leadership aims to protect citizens' communities. Citizens' communities decide on projects and get the direct benefits from it. Communities to which 9.5 million New York

4) Called working group. Official name is New York Renews

citizens, or 50% of the 19 million population belong are participating in green new deal projects.

Participating citizens can receive support but the benefits become their own. Electricity generated by the solar panels installed with the support from green new deal is owned by citizens.

New York State is working on an act that connects carbon budget with jobs as part of green new deal. The Climate and Community Investment Act is supported by over 30 members of the New York State Council.

This law will impose carbon tax on polluters which emit GHG or fossil fuel importers to raise \$15 billion in revenue every year.

This law also plans to promote grass-root green companies to grow green market. It is aimed at generating 160,000 stable jobs from the beginning. 16,000 jobs, in particular, will com from professional service, energy design, manager, maintenance staff, and training experts.⁵⁾

3) 'Cleveland model' and 'evergreen co-op'

This model was first tried in Cleveland, Ohio since in 2009. This model is worth our attention as it tried to address issues through co-op. Cleveland, once the most prosperous industrial city, was reduced to Rust Belt, as manufacturing industry collapsed and people began to leave the aging cities. The population of 900,000 in 1950 fell to 400,000 in 2009, with poverty standing at 30%. The income was the second lowest in the US at \$18,500. 'Democracy Collaborative' of Maryland University inspired the idea and theory of the early Cleveland model.

'Democracy Collaborative' served the same working group role as 'New York Renew'. This group continued to share models by hosting workshops with congress, colleges, and hospitals. Local governments, public institutions, colleges, hospitals, and military force with abundant resources became the anchor groups to purchase goods and services made by workers' co-ops of vulnerable class and citizens' co-ops. Anchor institutions which had procured goods from other cities and regions began to source from local co-ops. It contributes to local economic revitalization. The goal is local community wealth building.

Anchor institutions and non-profit working groups for consultative body to expand and strengthen co-ops. Evergreen Laundry Cooperative, founded by low-income class and unemployed people in the local community in 2009, is a good example. By introducing state-of-the-art laundry technic to reduce GHG and water resources, they were able to reduce water used to wash one pound of clothes from 3 gallons to 0.8 and save input energy. This met the criteria of environmental standards of hospitals and anchor institutions, allowing the co-op to grow from 12 members in 2009 to 150 in 2018.

Evergreen Laundry Cooperative led to the foundation of Evergreen Energy Solution in 2009, then Green City Growers Cooperative in 2013. It ultimately grew into Evergreen Co-op Corp with 320 people as of 2018.

This model revives in the city of 'Prestone' in the UK in 2013 which resembled Cleveland where manufacturing industry collapsed. CLES, or Center for Local Economy Strategies was founded in

5) Analysis by NY Renews: The Climate And Community Investment Act, An Engine Good Job Creation, 2021.

2011 in Prestone to serve as the working group like the 'Democracy Collaborative' of Cleveland.

They persuaded anchor institutions together with Prestone's parliament to support the creation of local co-ops. The Labor Party in the UK has accepted this model as the party policy and is spreading the model in regions where population is decreasing.

4) Mongolia Bayannuur model: Solve climate crisis and job crisis at once

Bayannuur sum is about 200km west of Ulaanbaatar, Mongolia. Once a vast green land, this area saw water and grass disappear due to abrupt climate change. In 2002, around 10 million cattle were frozen to death across Mongolia. Half of around 2,000 people in Bayannuur became climate refugees when their cattle died. 700 of them moved to city, where they had to struggle with extreme poverty. About 200 climate refugees of 40 households that remained began to plant trees on the desert land of 1 million m². They managed to farm and grow fruit trees, gaining economic independence.

Climate Response NGO and Purun Asia supported Bayannuur for education, consulting, necessary fund, and relation with the government. Residents formed community (initially mutual aid association and later transformed into a co-op) to make necessary decisions. Forestation, farm, fruit tree growing, sales, and deposit of common fund were all managed by residents.

Six years later in 2013, however, Bayannuur governor and rich people began to build houses around the 100-hectare land that the residents managed. The governor, who was also the head of local government with the power to issue land use license, revoked the residents' request to extend the land use for the purpose of taking the land. If the international NGO Purun Asia was leading the ecological restoration there, it would have been forced to leave.

Climate refugees had always known that they are the most vulnerable all the time and they would end up getting hurt if they rise up against those in power. They have been doing almost nothing for the past six months but now they were about to lose their land. Out of the desperation that if the 40 household lose their land, they would lose everything, they began nomad meeting and town hall meeting to battle against those who want to take their land. Opinions began to emerge that the governor be impeached. The governor finally succumbed and extended the land use license. If we had only recovered the ecology, we would have lost the land and failed. Community members realize their power and gain the strength to defend themselves through collective action and experience like this. This model is expanding to climate sites where Mongolian climate refugees reside. What's special about Bayannuur is that the 400 climate refugees who left the city have begun to return since 2015. They now know that there is a new hope as the land which had nothing but dust when they left a decade ago has turned into forest.

In 2014, the UN recognizes this Bayannuur case as the model case to solve climate crisis as other countries in Asia and Africa are in a similar situation. The UN gave the 'UN Land of Life Award' to recommend this model for sites in Asia and Africa.

This is how we rediscovered the community on the sites of climate crisis. We could have failed if what we did was just plant trees. But we learned the lesson that we have nurture people. We realized after failures over the past 20 years that citizens community is not build with participation only but needs empowerment and ownership for citizens.

Though not powerful enough now, the collective action taken by climate avictims gave them the power to defend their right to decision. There are models that resemble the Bayannuur model in nine cities in Mongol with 200 households forming citizens' co-op and mutual aid association. Good jobs and green jobs effect like this is spreading.

The structure of co-ops participated by climate victim citizens features 'fruit processing plant', 'urban organic shops' that sell local produce, 'town co-op', 'cultivation center', and 'forestry and agriculture education center'. Their tasks are promoting the collaboration between co-op association and co-ops that connect individual bodies.

Asia is serving as the working group on this process.

4. Conclusion

We would like to offer 'citizens' path' as a solution for climate crisis. We can't solve climate crisis with the coalition between government and great capital. No one has been to the path to decarbonization. We have no prior examples of solutions, which makes it all the more important to try in a more bold and various manner. As voters, consumers, New York citizens, and Mongolian climate refugees have shown, the key to the path made by citizens lies in executing and winning rights. The result is good and green jobs. The challenge is how we organize. New York, Cleveland, and Bayannuur will present a good reference.

Job Policy to respond to Climate Change

Lee Yu-jin

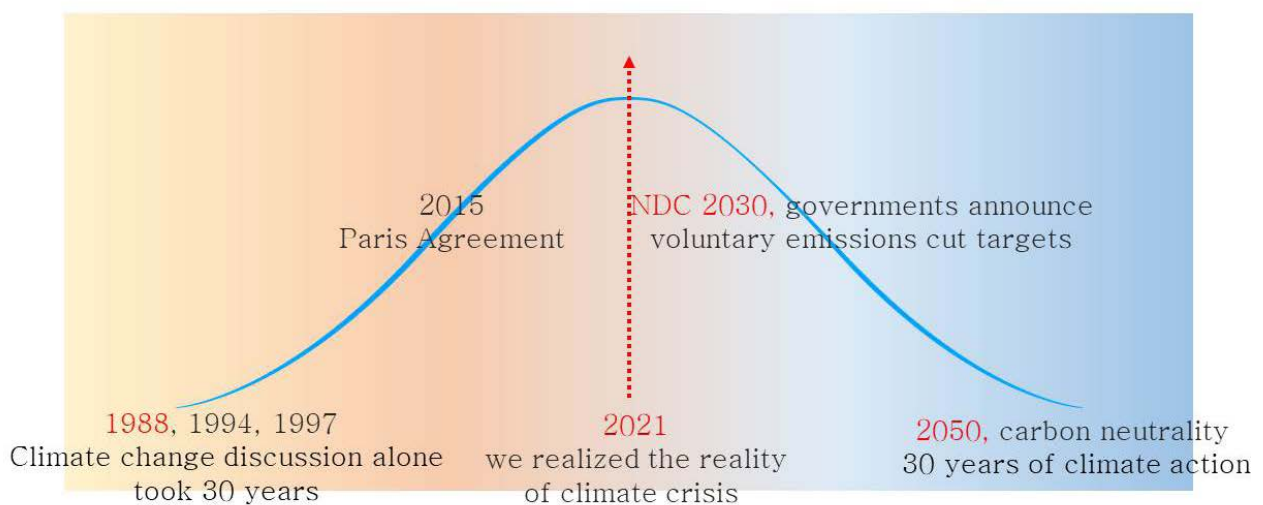
Institute for Green Tranformation vice director

Job Policy to respond to Climate Change

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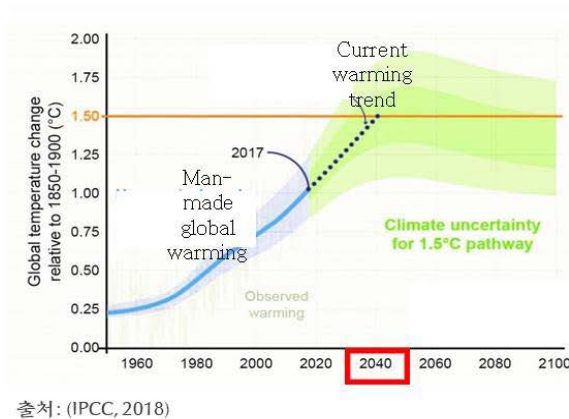
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Where do we stand now?

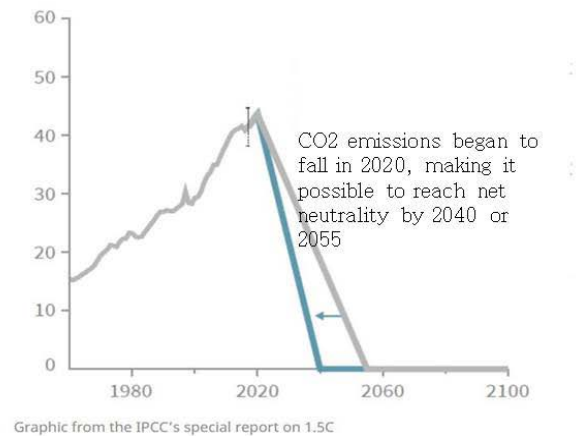


Reasons for 2050 carbon neutrality

When will the average global temperature reach 1.5°C?



Path to carbon neutrality



3

How can we make society carbon-neutral?

10 Key Solutions Needed to Reduce Greenhouse Gas Emissions

1. Shutdown all coal power plants
 2. Invest in energy-efficient renewable energy
 3. Building remodeling
 4. Decarbonize cement, plastic, and steel
 5. Transition to EVs
 6. Expand public transit
 7. Decarbonization of air and shipping industry
 8. Stop deforestation and recover soil
 9. Reduce food loss and waste
 10. Vegetable-rich diet
Cut down on meat consumption
- Source: WRI
- WORLD RESOURCES INSTITUTE

Population of 51.8 million, 40.7% of electricity generated by coal power plants

24.3 million vehicles (As of Dec. 2020), 150,000 EVs

11,331 gas stations

1,225 industrial complex, industrial sector 36%

3.645 million cows

In what year will **combustion engine** cars be banned?

When will **coal power plants** be shut down in Korea?

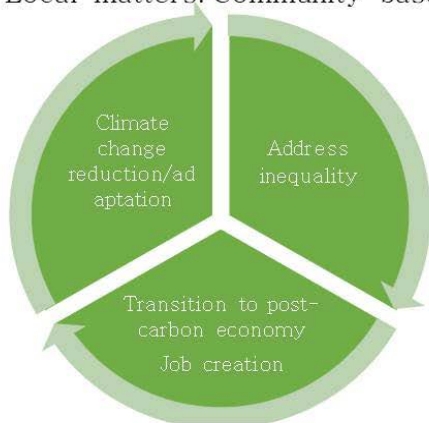
What are the policies for disappearing jobs in carbon neutral society?

Education? Tax? Energy price in carbon neutral society?

4

Economy in the carbon neutral era in 2050? – Alternative economy

– ‘Local’ matters! Community-based social economy



Great transition to post-carbon economy and society for climate change response, inequality eradication, and creation of green jobs



Can we keep the current economic system and its scale if we are to achieve net GHG emissions by 2050?

Local-based social economy –
Providing citizens with local-based necessities and services and restoring community resilience

Resilience infrastructure for local communities in the era of with-Corona and climate crisis

– Roles of local communities and local governments grow

- Covid-19 → Reduced travelling and mobility → living area within local governments and precinct unit
- What's necessary for community in case of disaster : friends in neighborhood
 - ① Medical health that guarantees public benefits
 - ② Anti-disaster drill and manual
 - ③ Houses for cold and heat response and reduces energy cost
 - ④ Locally generated renewable energy
 - ⑤ Healthy food that reduces CO2 emissions
 - ⑥ Public transportation and bicycle
 - ⑦ Resources circulation (wastes and plastic)
 - ⑧ Care support for seniors, disabled people and children
 - ⑨ Green zones and bio-diversity



① Houses for cold and heat response and reduces energy cost

- Remodeling project to improve insulation of aged houses (reduce GHG, and job creation)

- Purpose : Support cost for **voluntary house remodeling** to help low-income citizens living in aged houses
- Outcomes :
 - President Obama spent \$5.6 trillion over three years for 1 million houses to improve house energy efficiency. A dollar invested for extra project returned as \$1.72 for energy convenience, and \$2.87 for economic impact.
 - Seoul City's Gaggum House(1,600 houses remodeled as of August 2020).
 - Energy demand of aged houses could fall by 30~40%
 - 10,000 aged houses can generate a market worth ₩150 billion
 - (Average remodeling cost of ₩15 million per house. About ₩700 million-project that covers up to 50% of the construction cost for Gaggum House)

- Policies to connect with social economy :
 - Engage social enterprise for energy efficiency projects for houses
 - Job creation in house insulation projects, performance assessment and quality control, and certification management
 - urban regeneration, LH Green Remodeling
 - Social house co-up and GHG reduction, town management co-op

Source: Hakyong Park (Director for Urban Regeneration Support Center House Project), Policy to Connect Seoul's Gaggum House Project and Green New Deal



② Locally generated renewable energy

- Participatory energy co-op that generates renewable energy

- Purpose : Create energy co-ops based on citizens' participation to generate renewable energy including solar power

- Status :
 - Sunshine power generation co-op created based on Seoul FIT policy of 2013
 - Misinformation about solar power and difficulties in securing land to install solar panels hamper the project

- Policies to connect with social economy :
 - Renewable energy co-ops of solar power, wind farm, and bio energy necessary to promote
 - Policy improvement and capacity building to help citizens organize energy co-op (Spatial cooperation with local government essential)
 - Finance and collaboration: Launch 'Korea Plant Roof-top Holdings Company' through the governance between Korea Social Value Solidarity Fund's 'Solar Connect' and impact investment firms

Participatory energy co-ops in Seoul

협동조합	설립일	조합원 (명)	조합원 평균 출자금 (만원)	총출자금 (만원)	발전소 (kW) 발전량 (kWh)	출자금 대비자입 비율(%)	배당 유무/비율	상근 활동가 유무(명)
강남햇빛발전협동조합	13.01.10	104	105	11,000	3/205.2	60	유/3	유(1)
강서햇빛발전협동조합	16.08.08	140	30	3,260	1/48.2	90	무	무
공천햇빛발전협동조합	12.12.27	65	68	4,420	1/50	80	유/1	무
노원햇빛발전협동조합	13.02.16	815	20	22,413	2/104.3	0	유/2	무
동구햇빛발전협동조합	13.07.14	476	134	62,898	29/서울3/ 2,139/서울 139.2)	50	유/4	유(2)
서울시민햇빛발전협동조합	13.01.09	396	112	44,286	3/72.2	70	유/1	유(17)
우리동네햇빛발전협동조합	12.12.15	509	34	16,775	3/99	30	유/1	유(1)
대안과미래에너지협동조합	13.04.19	371	104	35,222	5/330.2	50	유/3	유(2.5)
전체		2,846	75.8	200,274	48/2529.1 (서울22/ 529.3)	53.7		

출처: 서울연구원(2019) 시민참여형 에너지협동조합 발전방향

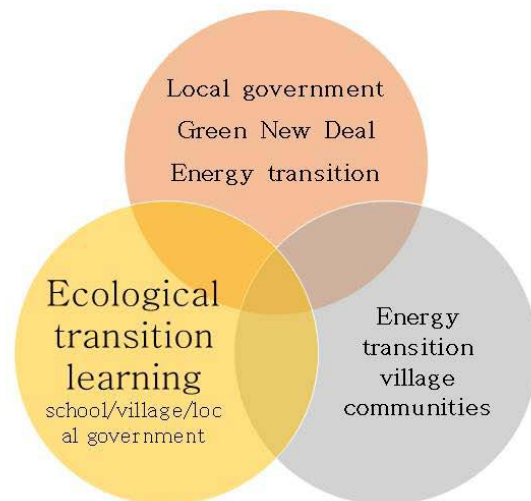
③ Transition learning and ecological transition school

– Learning about promoting citizens' participation in carbon neutrality by 205

- Purpose : The Korean government declared carbon neutrality by 2050 on October 27th, 2020, but people's awareness about carbon neutral society is still low. It is urgent to learn about and prepare for carbon neutral society
- Status:
 - Demand growing for increasing environmental education in schools and transition education
 - Convergence project between digital and green for the government's green smart school

Ministry of Education and Office of Education will spend a total of ₩18.5 trillion - ₩5.5 trillion (30%) of central budget and ₩13 trillion (70%) of local budget to improve 2,835 aged school buildings across the nation (green remodeling, smart devices, and online platform)

 - Ministry of Industry's dispersed energy roadmap-build regional energy center
- Policies to connect with social economy :
 - Educational co-op to teach about climate crisis and 2050 carbon neutral society
 - Train educational activists (Seoul citizen activists



④ Transition culture and art, entertainment, tourism

– Social enterprise for climate change response culture, art, and tourism

- Purpose : Sustainable entertainment, culture, and tourism should continue despite Covid-19 through social economy.
- Status:
 - 'Climate justice creativity company' collective 'duinggul', and Hwacheon cultural space Art Tutbat's [Art Tutbat artists residency - climate change] raise artists' awareness of climate change
 - Local community-based ecological expedition cases such as Sunheulgot social co-op (Ministry of Environment's pilot project, 2020 'Local customized ecological tourism director training and diagnosis (consulting))
- Policies to connect with social economy :
 - (Transition art space) Community-based town theater, transition theater, transition culture
 - (Community-based ecological tourism) wetland, ecology, environmental education
 - (Sustainable lodging industry) Sustainable management of hotels
 - (Carbon zero · low carbon tourism) transportation, accommodation, specialties

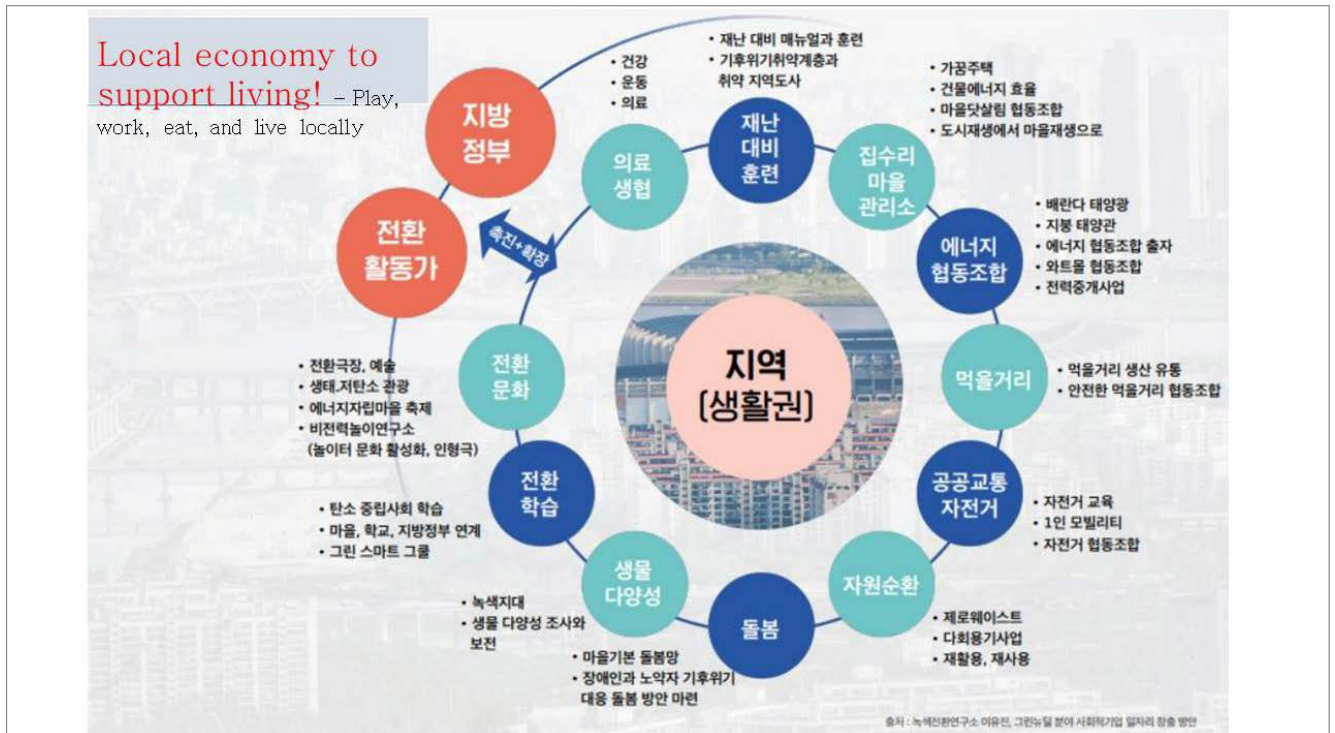
Sources: Heiyung Yu, An exploration into environmental activities in playing community, http://webzine.e-stc.or.kr/03_story/plan_view.asp?idx=1592



제주특별자치도 공모사업으로 환경을 생각하는 생태관광 프로그램
기후변화대응에 앞장서는 선율생태관광

Sources: Sunheulri, the village with wetland <http://ramsar.co.kr/>

Sunheulgot social co-op helps generate income for communities by operating ecological tour programs in Dongbaekdongsan in Jeju Island since 2017. The courses include Uljin Upright Korean red pine trail, Jumbong mountain Gombaeryeong forest trail, and Jeju Geomun Oreum UNESCO Heritage site.



Jobs Responding to Climate Crisis in the Region

Seo Nan-ye

Head of Welfare and Environment Committee Jeonju City Council

On August 9, 2020, Kyunghyang Newspaper ran an article that read: "It's Not Monsoon Rains, It's Climate Crisis." The main example the article suggested was the unprecedented damages caused by heavy rainfalls in Jeonju.

Jeonju citizens now feel the threats of climate crisis including high fine-dust levels, urban heat island, and devastating floods. It is the time to call it "climate disaster" instead of climate crisis and designate our city as a climate disaster-stricken region so that we can take actions to design comprehensive solutions.

While climate crisis has been an agenda for decades, it was deemed an issue to be resolved by the central government. There have been no long-term plans by local governments.

However, with the New Deal Project by the Moon administration pursuing regionally balanced development, things are changing. Local governments are now entitled to diverse support programs including special grants, excess issuance of municipal bonds, and special accounting benefit for balanced development.

Locally financed projects are required to pass no or simplified screening processes while projects invested under the New Deal Project are exempted from preliminary feasibility study.

In line with that, Jeonju has also taken diverse measures. For example, the city has been devising solutions to fight air pollution using big data and has built gardens and forests to benefit its citizens and the environment.

With that, I would like to share with you some ideas and directions for climate crisis-related jobs that can be made by civic society and private institutions entrusted by the local government.

First, citizens can form a cooperative with the mission to reduce packaging wastes. According to the 2019 GreenPeace report "Plastic Korea: Lure of the Disposable," Koreans use 3.3 billion disposable plastic cups per year. If you make a bridge with all those cups, you can go as far as 384,400km connecting the earth and the moon.

It is inevitable for our city to take actions. I believe that we must find ways to recirculate resources and reduce wastes. We need reduction targets and indices, which offer the grounds for action plans and implementation.

It is not that we do not have eco-friendly alternatives. Domestic companies have made and sold containers made of marine plants, but businesses can not easily choose them over plastics due to their high costs.

In addition, while the eco-friendly products can create meaningful and practical values only when they are buried in a landfill after use, they in most cases end up in waste incinerating facilities.

Against this backdrop, I came up with an idea to connect this issue with catering services providers who have been struggling since the outbreak of COVID-19.

Catering businesses that already have dishwashing facilities, containers and plates, and delivery vehicles can work with food delivery businesses within the region, recollect used containers from citizens to wash and reuse them. The city government will do sanitary inspection on the businesses and disclose the results to the public to make sure the containers citizens use are clean and safe.

The prolonged pandemic had people embrace food delivery as part of their life, resulting in more plastic wastes for every household. To reduce them, we need to promote the use of alternatives. The current "Yongginae Campaign" that gives discounts for consumers bringing their own containers is good but can go only so far because it is not practical for office workers. In many cases, they have no option but to throw away plastic containers after use. I believe if we divide the city by sections and apply this business model for each section, it will surely help create jobs.

Second, we can provide support for businesses that replace their parcel packing materials with eco-friendly products. One good example is Market Kurly that improved their packing and containers. We now need to work with parcel delivery businesses in the region so that all businesses in the field make a concerted effort to adopt recyclable and reusable packages and containers.

Styrofoam, ice packs, duct tape... Businesses need to think about what they use and take small yet bold actions. And we must think about what we can provide for participating companies, such as job creation support.

Third, we need to provide research support for businesses in the industrial complex. Currently, the city offers no support for eco-friendly businesses in the Jeonju industrial complex. Companies producing eco-friendly products and those adopting green manufacturing processes must be compensated. The city needs to expand such benefits to attract more eco-friendly businesses as well. It is pressing time to implement policies that can actually change the life of citizens. If we fail to make a change and build the basic structure for resource recirculation now, we will never have an opportunity to work with the world towards carbon neutrality.

In addition to creating jobs responding to climate crisis, we can also devise policies to protect the vulnerable who are in a dangerous position due to the crisis.

As mentioned earlier, Jeonju city has commissioned a private energy business to operate an energy center, build a solar plant, and provide energy training. Also, the city's upcycling center supports creative works of artists in an effort to recirculate resources. The Elderly Care Department has launched a comprehensive caring service to provide care beyond the elderly to the disabled.

Creating jobs responding to climate crisis must be organically linked with other systems, such as social services, resource recirculation, living support and eco-friendly jobs in the industrial complex.

However, regional governments lack policies to support people suffering from climate crisis.

This year, the Association of Local Governments for Carbon Neutrality consisting of all local governments in Korea (17 wide-area units and 226 basic units) had a declaration ceremony for "Carbon Neutrality in 2050." The declaration itself was meaningful but it still lacks practical policies for the vulnerable and ideas to unite local governments to play an active role.

To achieve carbon neutrality by 2050, local governments will develop and implement carbon initiatives in phases while identifying and supporting projects to reduce GHGs in urban areas and improve climate adaptation capabilities. But that is a macro-level approach. I believe we need to further our discussion for micro-level policies so that we can make climate response measures from citizens perspective, create jobs for the marginalized, and provide living and labor support for environmentally challenged people.

Last but not least, I want all of us to review the attached list of jobs and see whether we have proper jobs to fight climate crisis in the region. In addition, while our city proclaimed it is to become a hydrogen city, we still produce hydrogen using electricity instead of renewable energy. That is not the right direction towards the carbon neutral era.

An atmospheric scientist, Cheonho Cho, said in an interview that "climate crisis cannot be recovered. For example, think about the day where you cannot find any food in a market due to climate crisis. Today, the governments spend public money in a form of disaster relief trying to overcome crises. But if the climate crisis goes beyond a certain point, you cannot buy anything in a market with that money. It is an incalculable risk that will break the civilization. Europe is not putting climate crisis at the top of its agenda for fun or to be snobbish."

Climate disaster is not in the future. It is the disaster here with us already and we cannot wait anymore.

<Annex>

1. List of Jobs in Jeonju City

Classification		Bureau	Department	Project Title (Details)	No. of People	Budget (Million won)					
Type	Area					Total	Central Gov.	Province	City	Others	
Grand Total					24,556	189,851.28	97,054.71	22,949.58	66,628.59	3,218.4	
Total					19,573	137,571.26	76,725.7	17,236.17	43,115.99	493.4	
Direct Job Creation	City Admin Affairs Innovation	Planning & Coordinating	General Affairs	Short-term jobs	427	4,500			4,500		
		Planning & Coordinating	General Affairs	Hiring government employees	190	2,280			2,280		
		Planning & Coordinating	General Affairs	Temporary jobs	50	86			86		
		Planning & Coordinating	Planning & Budgeting	New jobs and local facility management corp.	20	480			480		
		Planning & Coordinating	Local Administration	Jobs for volunteering coordinator	2	58.96	29.48	11.79	17.69		
		Welfare & Environment	Life Welfare	Operating JeonjuSaram, Jeonju Welfare Foundation	7	540			540		
		Welfare & Environment	Women & Family	Increasing public kindergarten	75	1,320	660	198	462		
		Eco-City	Living Welfare	Repairing old houses for low incomers	7	177		38.5	138.5		
		Welfare & Environment	Clean Air & Energy	reduction support and illegal exhaust monitoring staff	4	132	66		66		
		Public Health Center	Health & Administration	Public project for dementia caring home	1	20	10		10		
		Clean Water	Water Quality Mgmt.	Weeding at water cleaning facilities	5	70			70		
		Civil Transportation.	Bike Policy	Visiting safety class	8	50			50		
		Garden Resource Recirculation	Green Park	Wildfire monitoring staff	63	684		82	602		
		Garden Resource Recirculation	Green Park	Wildfire prevention & extinguishment team	86	943	377	170	396		
		Garden Resource Recirculation	Green Park	Forest biomass collector	5	75	38	11	26		
		Garden Resource Recirculation	Green Park	Forest resource researcher	3	251	125	38	88		
		Garden Resource Recirculation	Green Park	Pest control team	8	102	53	15	34		
		Garden Resource Recirculation	Green Park	New green jobs (Urban green area managing staff)	2	16		5	11		
		Garden Resource Recirculation	Green Park	Forester	5	84			84		
		Garden Resource Recirculation	Green Park	Forest building patrol	5	84	43	12	29		
		Garden Resource Recirculation	Green Park	Forest coordinator	1	21	11	3	7		
		Garden Resource Recirculation	Green Park	Eco-forest maintenance and management	3	21		3	18		
		Garden Resource Recirculation	Green Park	Forester	8	144			144		
		Garden Resource Recirculation	Green Park	Urban green area managing staff	2	21	11	3	7		
			Clean Water	Water Admin.	DB management for e-water bill	14	57	28	9	20	
		Small business owners support and stabilization	New Growth Economy	Youth Job Policy	Traditional market support	26	408		122	286	
			New Growth Economy	Youth Job Policy	Traditional market manager	1	24	12	7.2	2.4	2.4
			Increasing public jobs	New Growth Economy	Youth Job Policy	Local social work	960	4,873	4,386.22	194.68	292.1

Classification		Bureau	Department	Project Title (Details)	No. of Peopl e	Budget (Million won)				
Type	Area					Total	Central Gov.	Province	City	Others
		New Growth Economy	Youth Job Policy	Public work	480	1,901			1,901	
		New Growth Economy	Youth Job Policy	Local community work	54	309	154	46	109	
		New Growth Economy	Youth Job Policy	Quarantine work	144	630	315	126	189	
		Garden Resource Recirculation	Cleaning support	New cleaning staff for directly managed area	15	15.3			15.3	
		Social solidarity support	Social solidarity support	Self-support project	700	6,456	5,811	258	387	
	Customize d for different groups and classes	New Growth Economy	Youth Job Policy	Region-led youth jobs	192	3,675	1,764	166	1,374	371
		Welfare & Environment	Life Welfare	Local social service investment	300	4,870	3,409	487	974	
		Welfare & Environment	Life Welfare	Housework and nursing help at home	100	1,413	989	141	283	
		Welfare & Environment	Life Welfare	Helping the disabled for daily activities	1,451	31,622	22,136	3,794	5,692	
		Welfare & Environment	Life Welfare	Rehab for disabled children	50	2,045	1,431	205	409	
		Welfare & Environment	Life Welfare	Job welfare for the disabled	165	1,063	532	212	319	
		Welfare & Environment	Life Welfare	Dispatching visually impaired masseur	16	328	164	66	98	
		Welfare & Environment	Life Welfare	Helping caregiver for people with developmental disorder	12	349	174	70	105	
		Welfare &	Comprehensi ve Care	Caring service for the elderly	330	6,147	4,302	645	1,200	
		Environment	Comprehensi ve Care	Supporting the elderly's social activities	11,233	40,811	20,406	8,162	12,243	
		Welfare &	Comprehensi ve Care	Creating jobs for the elderly	200	705			705	
		Environment	Comprehensi ve Care	Paid volunteering for the elderly	1,170	50			50	
		Welfare & Environment	Comprehensi ve Care	Senior club operation	300	980		87	893	
		Welfare & Environment	Life Welfare	Jobs for war veterans	28	97			97	
		Welfare & Environment	Women & Family	Childcare support	35	6,879	4,815	825	1,239	
		Welfare & Environment	Women & Family	Alternative teachers for kindergarten	52	1,417	850	283.5	283.5	
		Total					3,082	1,078.3	288.7	75.3
Employment Service	Employment Service	New Growth Economy	Youth Job Policy	Job support center at universities	100	20			20	
		New Growth Economy	Youth Job Policy	Job support center operation	950	-				
		New Growth Economy	Youth Job Policy	Jobseeker and recruiters meeting event	150	10			10	
		New Growth Economy	Youth Job Policy	Youth job study group support and consulting	40	105			105	
		Welfare & Environment	Life Welfare	Job support center for the disabled	2	70			70	
		Welfare & Environment	Life Welfare	Customized job support for disabled low incomeers	20	200			200	
		Welfare &	Comprehensi ve Care	Job support center for the elderly	400	219			219	
		Environment	Comprehensi ve Care	Support for socially contributing activities	100	153	138		15	
		Welfare & Environment	Women & Family	Support for women with interrupted career	1,320	301.3	150.7	75.3	75.3	
Total					60	1,988	1,110	83	795	-
Attracting Businesses	Attracting Businesses	New Growth Economy	SMB	Attracting businesses and promoting investment	60	1,988	1,110	83	795	-
Total					115	15,530.26	8,051.11	1,435.23	3,543.92	2,500

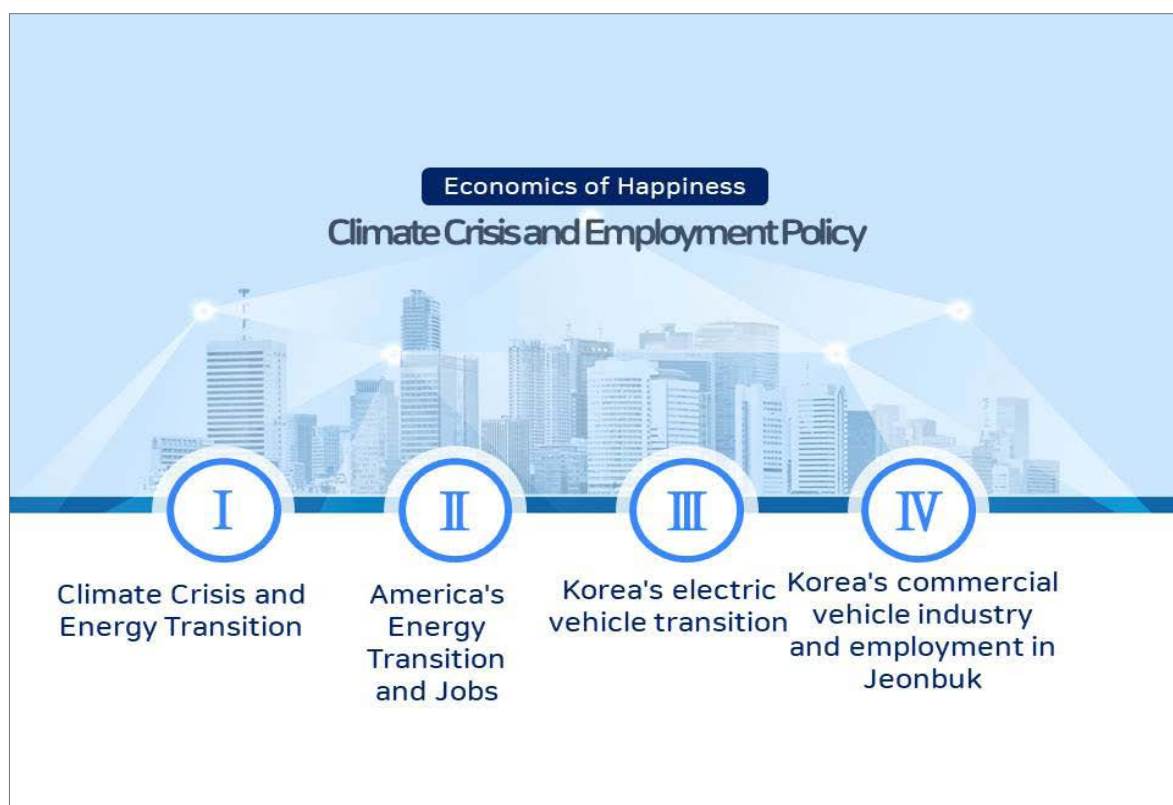
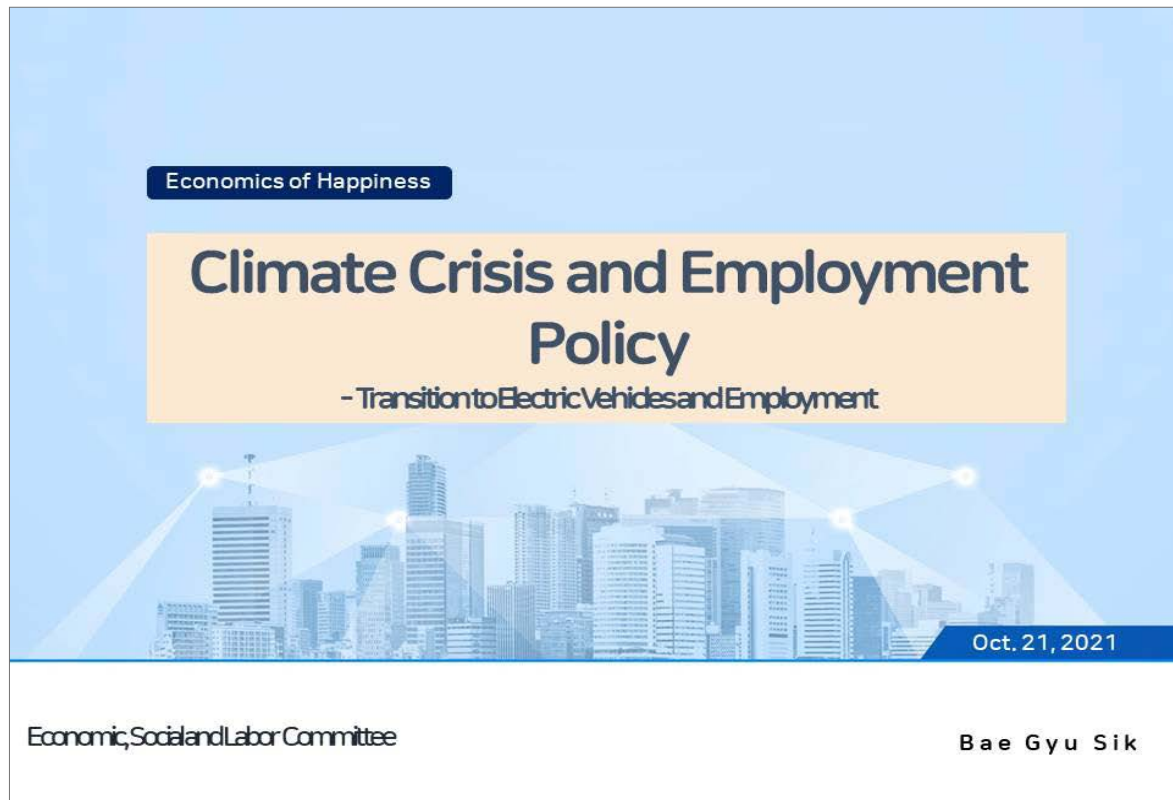
Classification		Bureau	Department	Project Title (Details)	No. of People	Budget (Million won)				
Type	Area					Total	Central Gov.	Province	City	Others
Job Infrastructure	Nurturing New Growth Industry	New Growth Economy	Hydrogen Economy Carbon Industry	Promoting global drone soccer	3	343			343	
		New Growth Economy	Hydrogen Economy Carbon Industry	Operating the K-ICT 3D printing center in Jeonju	3	250			250	
		New Growth Economy	Hydrogen Economy Carbon Industry	Nurturing professionals for the financial industry	5	200			200	
		New Growth Economy	Smart City	Jeonbuk Jeonju Smart Media Center operation	3	420	120		300	
		New Growth Economy	Smart City	One-person creative business center operation	5	143	93		50	
		New Growth Economy	Smart City	ICT Device Lab operation	5	320	160		160	
	Cultural and Tourism Jobs	Culture, Tour & Sports	Tourism Industry	Establishing Kimchi Marketing/Processing Center	4	130	65		65	
		Culture, Tour & Sports	Cultural Policy	Nurturing handicraft industry	50	280		140	140	
		Agri-Chemical Center	Food Policy	Jeonju Food Plan 2025 (Opening directly managed store)	13	160			160	
	Promoting social Economy	Social solidarity support	Local Community Support	Nurturing youth activists to support local communities	6	141.16	59.11	13.23	68.82	
		Social solidarity support	Urban Regeneration	Seohak-dong regeneration	6	4,221.5	2,400	4.54	367.5	1,000
		Social solidarity support	Urban Regeneration	Yongmeori Yeouiju village regeneration & new deal	4	1,827.6	1,353	223	251.6	
		Social solidarity support	Urban Regeneration	Dotorigol new village construction	4	989	731	94	164	
		Social solidarity support	Urban Regeneration	Jeonju station Innovation & growth	4	6,105	3,070	511	1,024	1,500

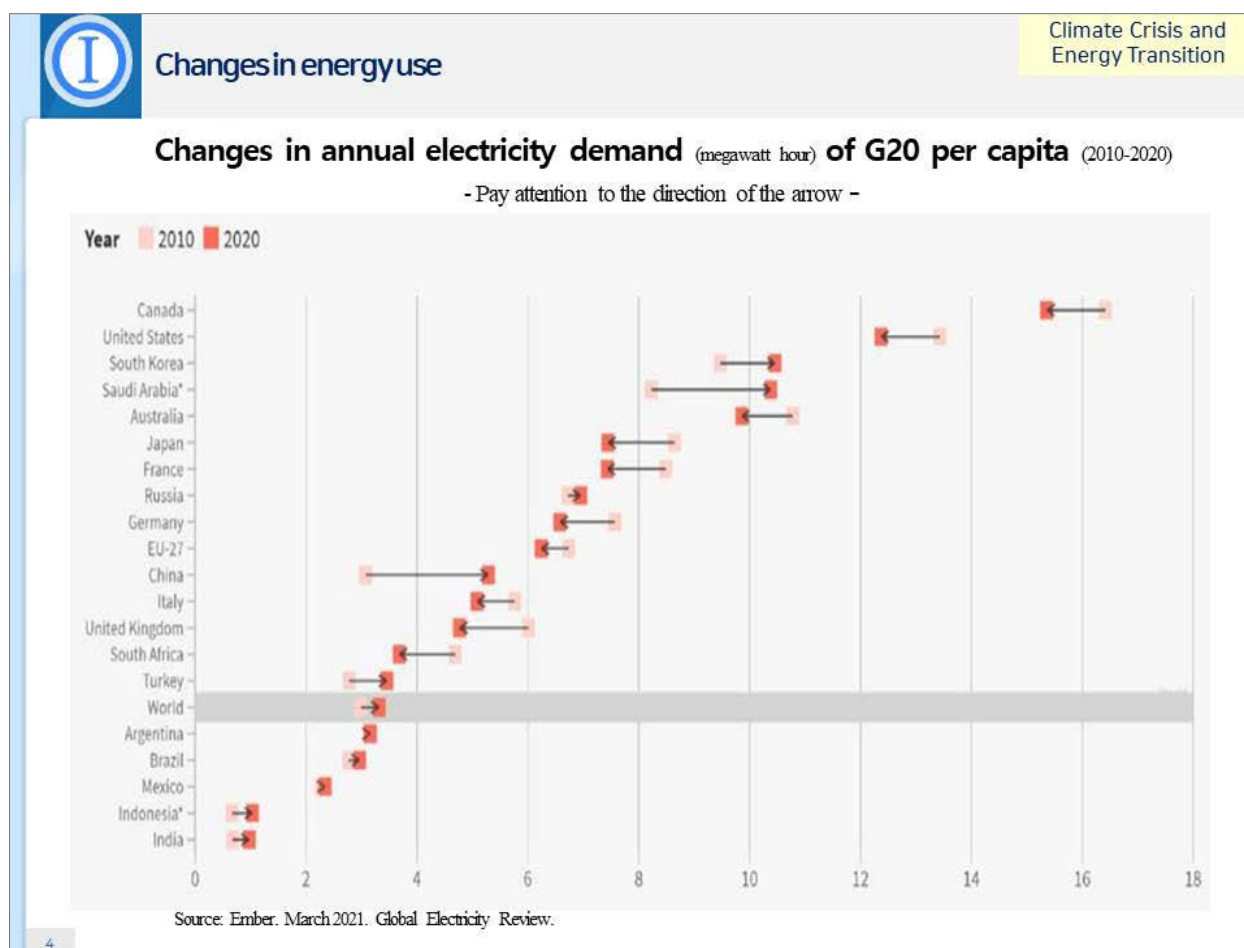
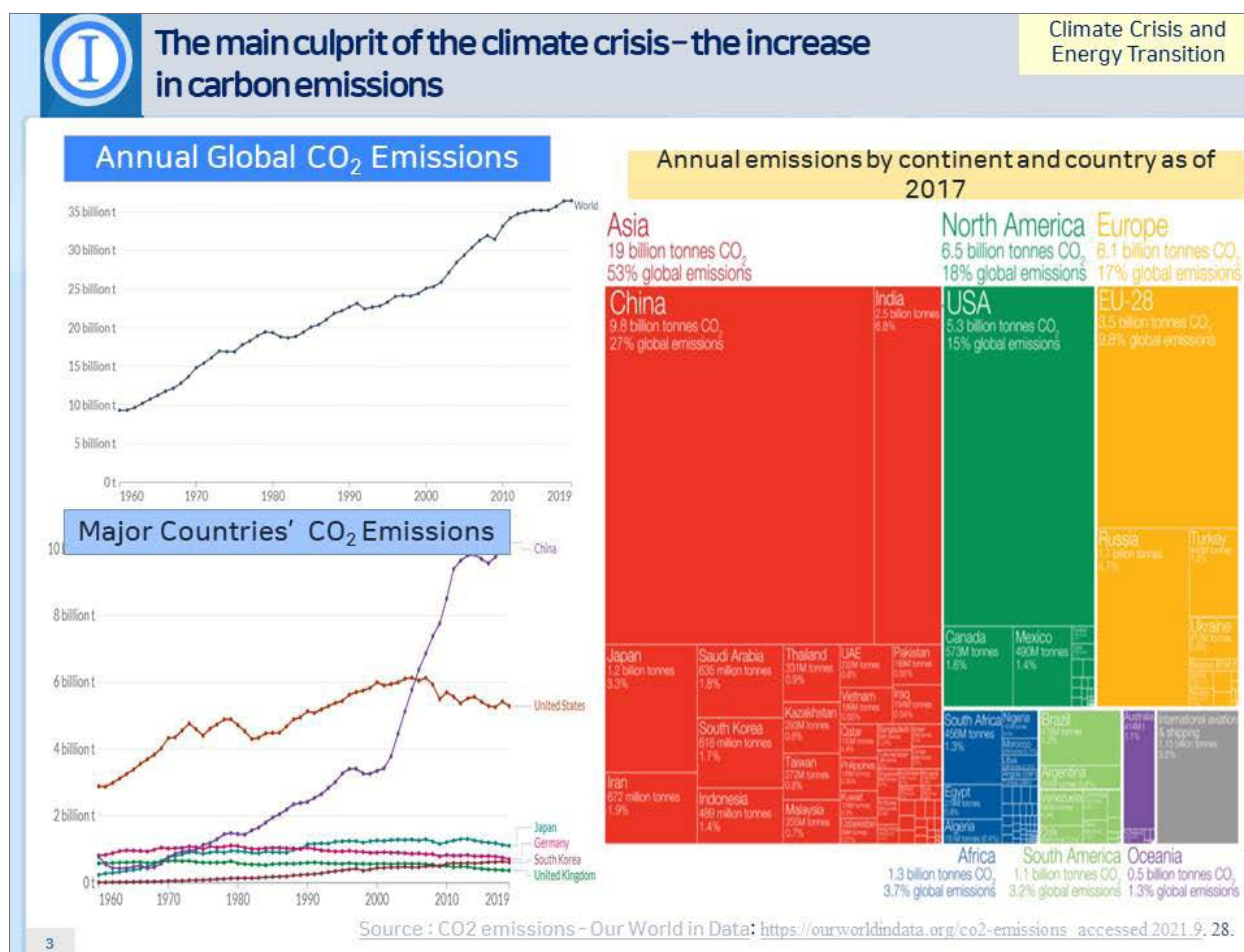
Climate Crisis and Employment Policy

– Transition to Electric Vehicles and Employment

Bae Kiu Sik

Economic, Social and Labor Committee





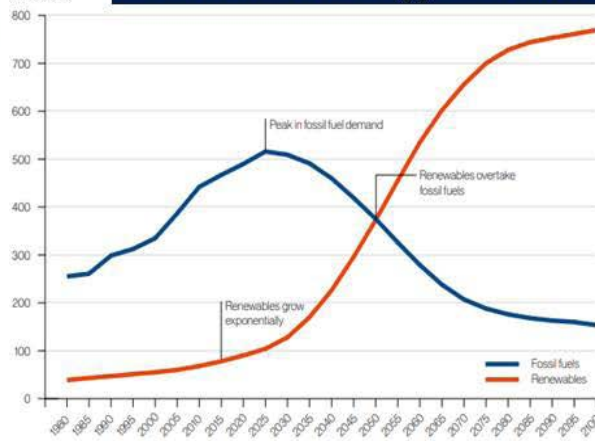


Energy Transition

Climate Crisis and
Energy Transition

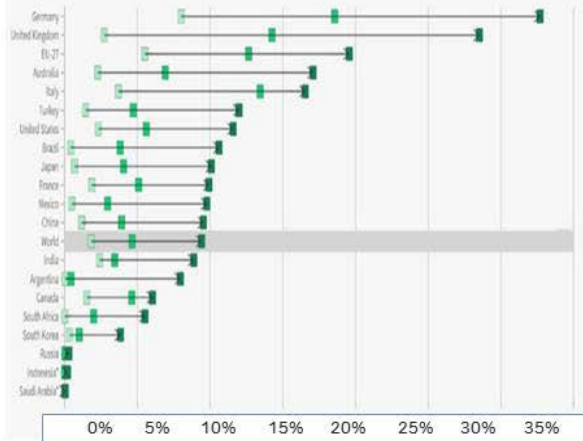
Major
energy
demand

The Frame of Energy Transition



Source: Irena. 2019. A New World The Geopolitics of the Energy Transformation, 17쪽

Comparison between the G20 countries in the ratio of solar/wind power generation in total electricity production



- Carbon neutralization in 2050 – Achieving carbon neutrality by reducing the use of fossil fuels and increasing the use of renewable energy
- During 2010-2020, the share of solar/wind power in G20 countries was 33% in Germany, 28% in the UK, 19.5% in the EU27, 12% in the US, 10.5% in Japan, and 9.5% in China. The world average is 9.5%.
- Korea is far less than 3.5%.

5



Recent changes in the composition of electricity by energy source.

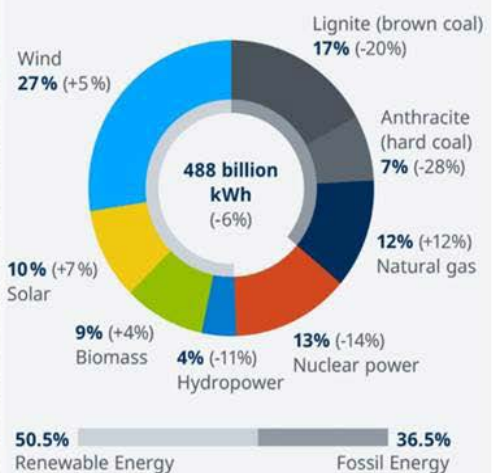
Climate Crisis and
Energy Transition

2015-2020 Changes in market share by energy source (G20)



Source: Ember. March 2021. Global Electricity Review.

Power source in Germany in 2020



Figures rounded (In brackets, difference from previous year)

Source: Fraunhofer ISE 2021 | *on the electricity grid

Note: +/- in parentheses indicate changes between 2019-2020

Source: Deutsche Welle. 2021.3.10. How Fukushima triggered Germany's nuclear phaseout

As of 2020 in Germany, renewable energy accounts for 50.5% of total energy, fossil fuels 36.5%, and nuclear 13.5%. The share of fossil fuels and nuclear power has fallen considerably compared to 2019, while the share of renewable energy has risen quite quickly.

6

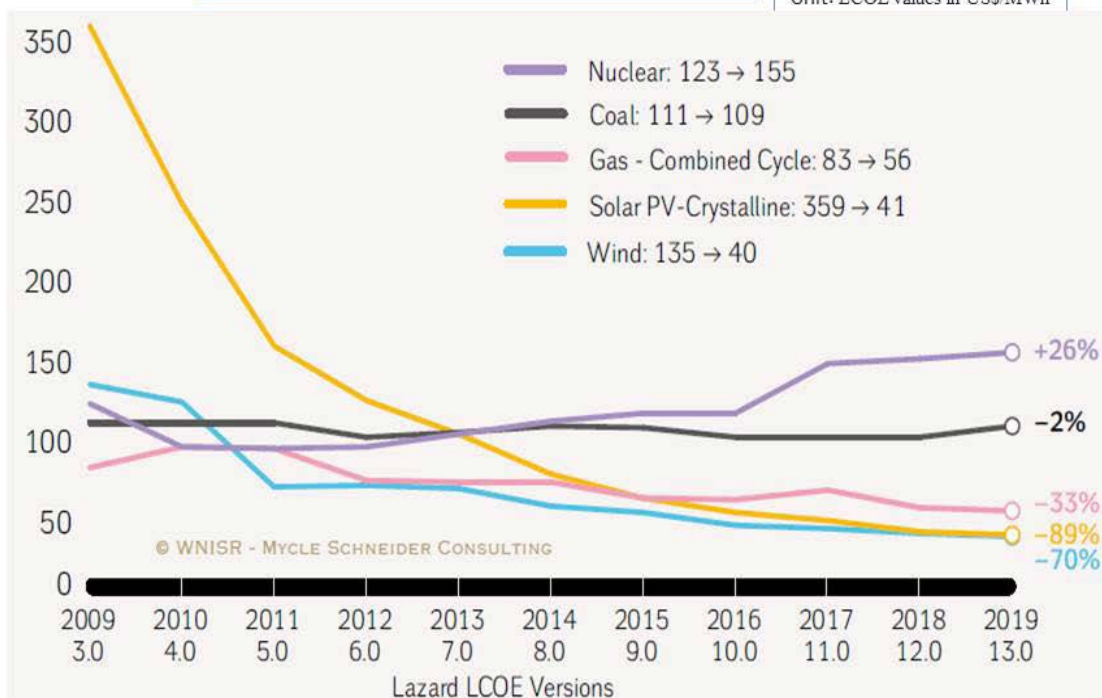


Reduction of power generation cost of renewable energy and increase of unit cost of nuclear power generation

Climate Crisis and Energy Transition

Changes in power generation cost by energy source

Unit: LCOE values in US\$/MWh



Source: Schneider & 2020. World Nuclear Industry Status Report 2020, p.269 Figure 50 - The Declining Costs of Renewables vs. Traditional Power Sources

7



Changes in global employment due to carbon neutralization

Climate Crisis and Energy Transition

Global job distribution by industry critical to the climate crisis

Industry	Jobs
Energy	30 million
Forestry	44 million
Logistics	88 million
Construction	110 million
Resource-intensive manufacturing	200 million
Agriculture	100 million
Total	147.2million

Source: UNFCCC, 2016

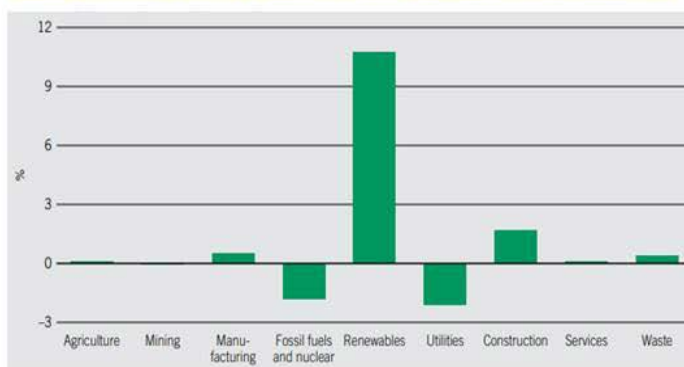
Risk of job loss and potential job creation according to energy sustainability scenarios

Risk of job loss		potential job creation (25 million jobs)	
7 million jobs	5 million jobs that can be relocated	20 million new jobs	5 million jobs
2 million jobs - the number of jobs that could be lost if workers were not re-skilled for new jobs		new training needed	Attracting workers who lost their jobs
	Needs re-skilling and skill enhancement to be reassigned within the same profession in a growing industry		

Source: ILO.

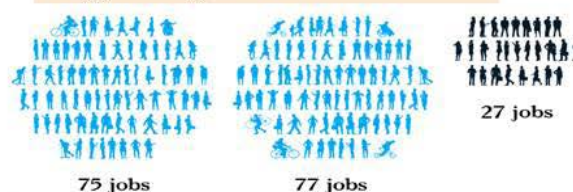
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Changes in employment by industrial sector due to carbon neutralization



Note: Utilities - industries that provide essential public services such as gas, electricity and rail
Source: ILO, 2018. World Employment Social Outlook 2018: Greening with jobs, p. 42

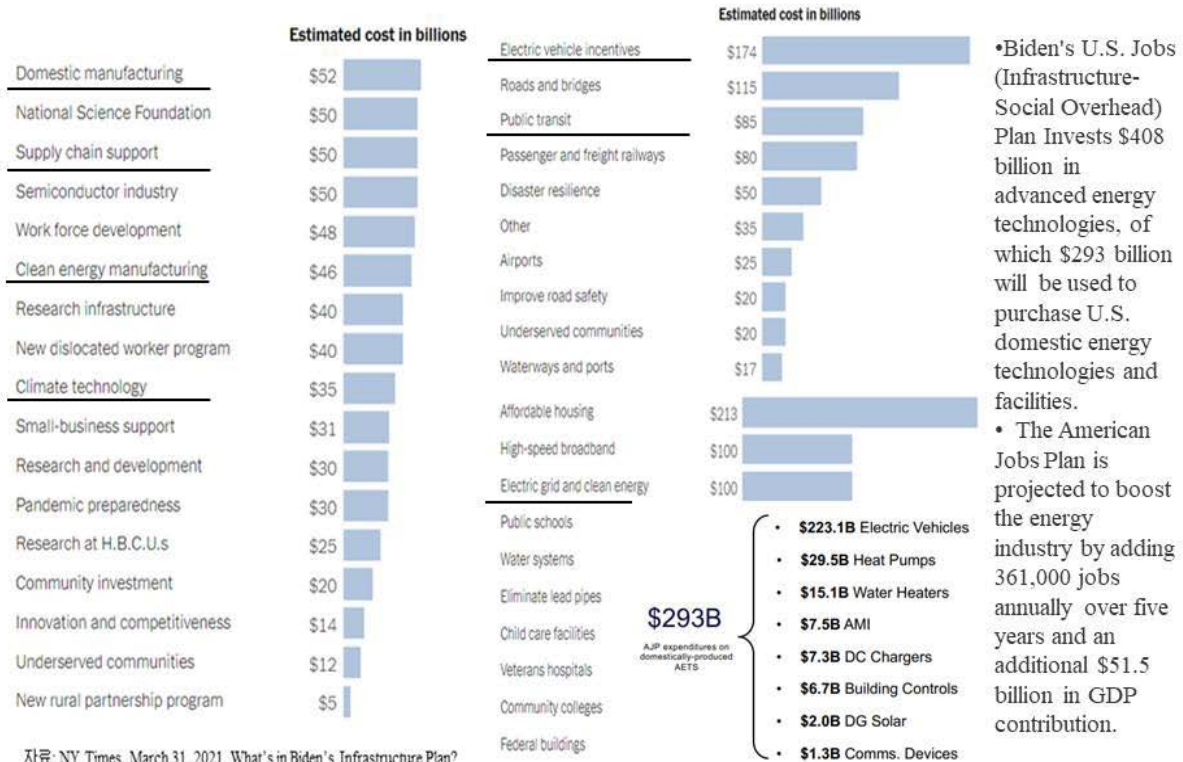
Number of direct and indirect jobs created per \$10 million - Renewable energy technology, energy efficiency, fossil fuel



Source: Heidi Garrett-Pettier, 2017. Green versus brown: comparing the employment impacts of energy efficiency, renewable energy and fossil fuels using an input-output model⁴⁴ Economic Modelling pp 439-47.



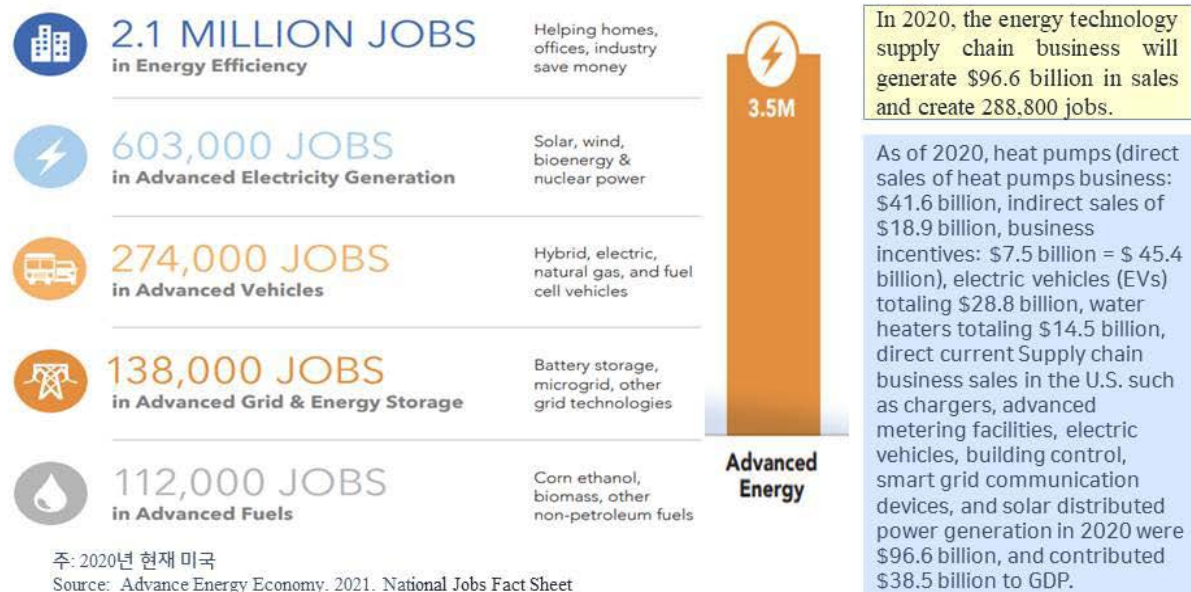
Energy Technology and Industrial Investment Plans in the Biden's Job Plan



9



Advanced Energy Technology Jobs (US, 2020)

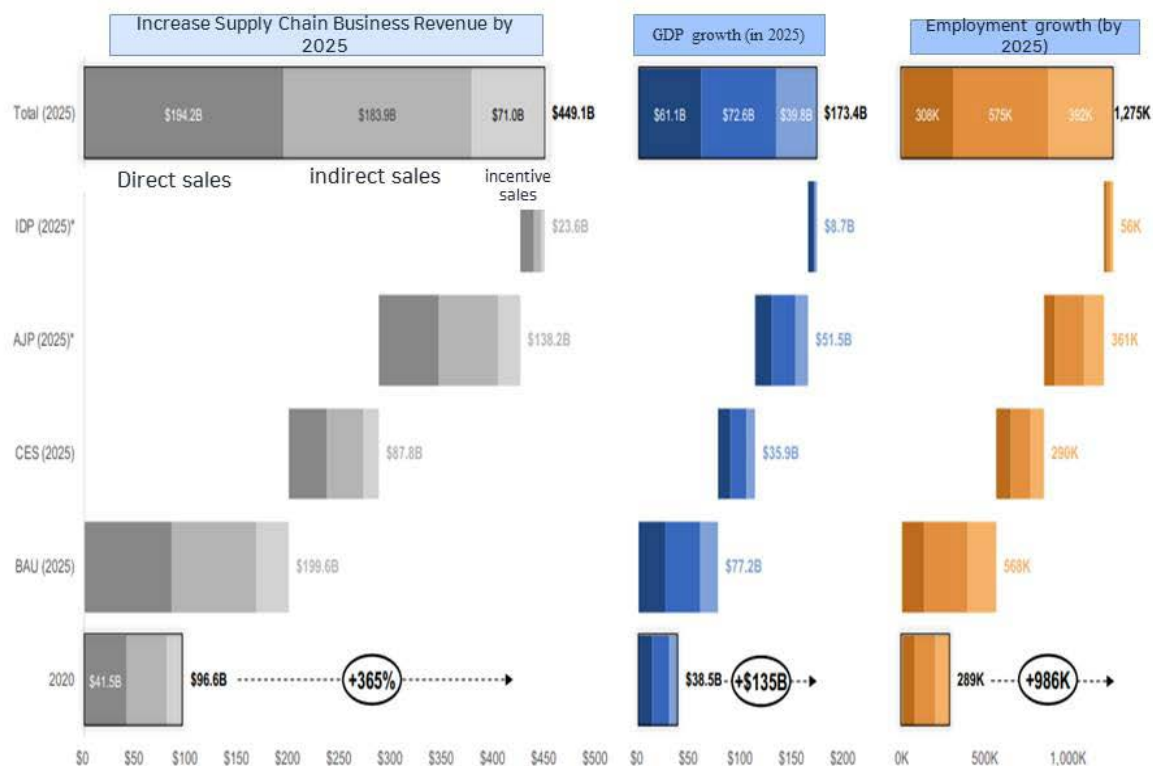


- In 2020, there will be 3.2 million jobs related to advanced energy technology (2.17% of the total employment of 147.8 million in the United States). In 2021, employment related to advanced energy technologies is expected to grow by 8%, doubling the projected overall employment growth of 4%.

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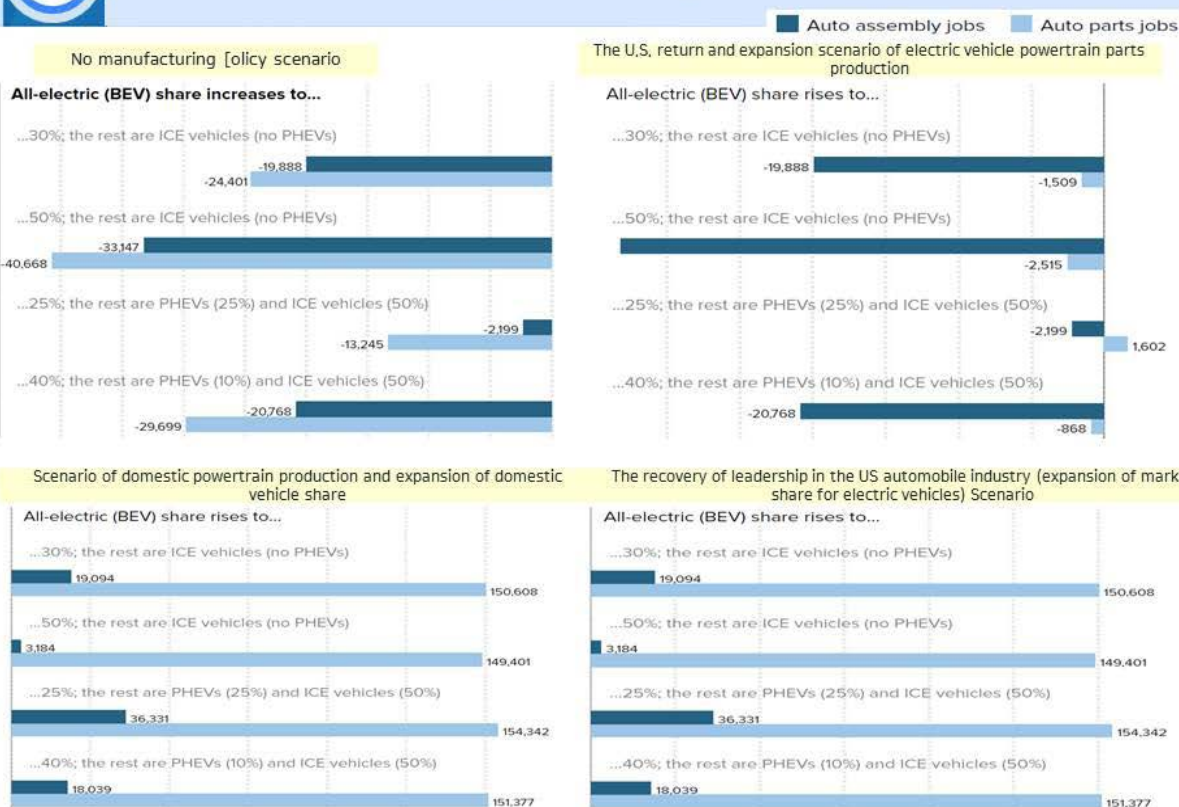
Increase in income and employment through the manufacturing supply chain using advanced energy technology in the US



11



Transition to Electric Vehicles (by 2030) and Changes in U.S. Employment by Scenario

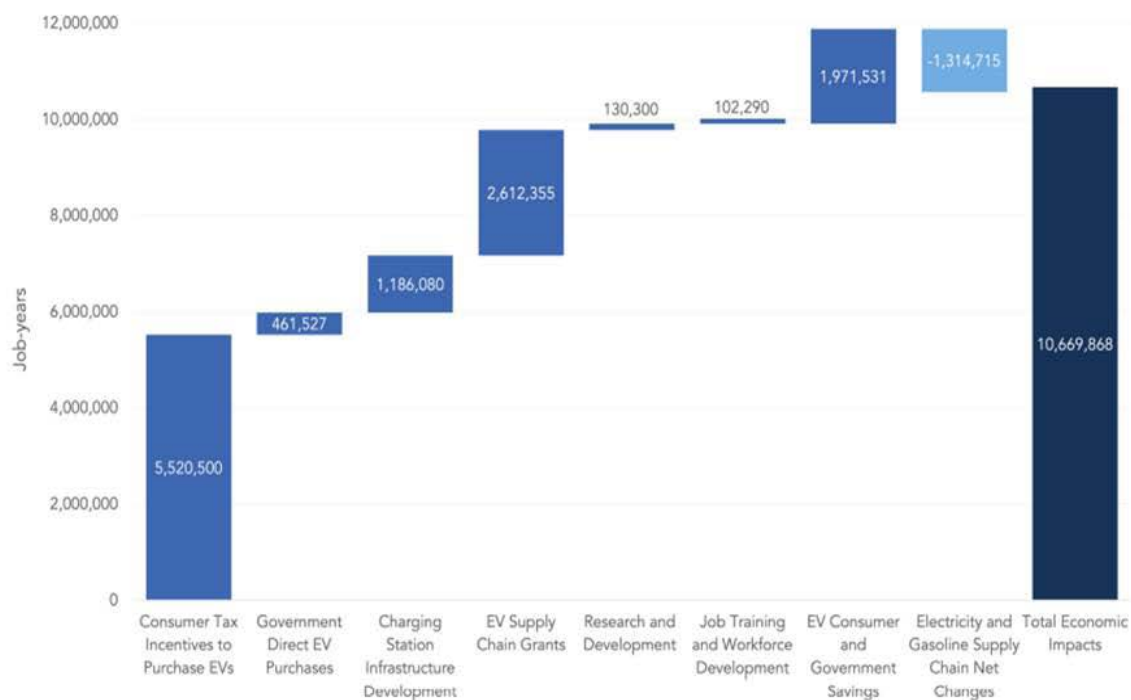


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Source: Barrett and Bivens. 2021.9. The stakes for workers in how policymakers manage the coming shift to all-Evs, Economic Policy Institute



Effect of \$274 billion electric vehicle investment on U.S. employment



Source: Hibbard and Darling. 2021. 6 Economic Impact of Stimulus Investment in Transportation Electrification, Analysis Group



Korea's electric vehicle transition

Korea's Electric Vehicle Distribution Strategy

Car type		Supply Status (August 2020)	Supply Strategy	Supply Goal (2025)	<Value added by future car parts>		
EV	Car	109 thousand	- Absence of new cars in 2019-2020-> Massive launch of new cars in 2021 (5 types) - Expand electric taxi subsidy in 2021 (7.5 million won + 2 million won additional payment in 2021) - Expensive compared to internal combustion engines -> Half price sale due to battery-less, etc. (2022)	920 thousand		Part	Added value (10 thousand won)
					Future car parts	Battery	1100
	Bus	1125	- Encourage the use of electric buses in semi-public areas (support for route bus operation costs) - Continuous launch of medium and large electric buses, introduction of purchase target system for bus operators - Conversion of scrapped city buses to eco-friendly buses (cooperating with Seoul Metropolitan Government)	110 thousand		Sensor	800
						SW	1000
						Motor	400
						Power management	200
	Truck	7607	- Secure subsidy (16 million won) at the level of maximum production capacity (25,000 units) in 2021 - Launched 0.8-ton~3.5-ton light-to-medium truck, continued expansion of subsidy budget - From 2023, the sale of trucks and diesel vehicles for parcel delivery will be banned.	1920 thousand		Sub total	3500
					Internal combustion engine	Body, wheel, etc.	1200
						Total	4700

Import-dependent items; localization of 14 core parts
Technology independence of core parts (14 types) that are highly dependent on foreign countries such as buses and trucks and large motors
161.7 billion won invested in the development of ceramic materials for bearings from 2020 to 2026
(Example of major parts for GVC)

Part	Description
Large motor	Motor for large hydrogen truck
High speed motor bearings	Mounted on an ultra-high speed electric motor
Capacitor thin film material	Used for electric direct current (battery), alternating current (motor) power conversion parts, high temperature durability is required
Electric vehicle high voltage relay	Electric vehicle power supply parts, overcurrent accident prevention parts in case of an accident
High-speed communication connector	Signal transmission between electronic components, dustproofing, and waterproofing are required through high-speed communication, etc
Wiring harness	Wires (bundle) between electronic products in the vehicle

(2) Core parts
o (Battery) Retaining about 20% of automobile exports (\$43 billion in 2019), we achieved the world's first place in orders for secondary batteries (\$7.4 billion in 2019) and technology level, and foster secondary batteries and fuel cells as secondary semiconductors
o (Other core parts) Cultivate the world's best company in future car parts by taking the lead in core technologies for future cars that are highly value-added and highly dependent on imports, such as automotive semiconductors, sensors, electronics, SW, and lightweight materials

Source: Joint government ministries, 2020, 10, Future automobile expansion and market preoccupation strategy



Changes in auto parts due to the transition to future vehicles (electric vehicles)

Changes	Classification	Auto parts
Decreased or unnecessary part	engine body	Crankshaft, piston, piston pin, piston ring, cylinder, cylinder head, cylinder head bolt, cylinder head cover, cylinder head gasket, V belt, fly hole, drive plate, ring gear, engine block, engine assembly, cylinder Liner, connecting rod, engine metal, etc.
	Engine valve system	Camshaft, valve rocker arm, engine valve, valve spring, valve seat, valve guide, valve lifter, timing chain, timing crank pulley, variable valve timing unit, variable valve lift mechanism, timing tension, timing chain cover, pulley (pulley), etc.
	engine fuel gauge	Fuel injector (gasoline), throttle body (gasoline), pressure regulator, fuel pump (gasoline), fuel tank, volatile fuel return device (canistor, etc.), electronic diesel fuel injection device, fuel tube, fuel filter
	engine intake and exhaust	Air cleaner, intake manifold, type charger, inter cooler, exhaust manifold, exhaust pipe, EGR valve, O2 sensor, catalyst, catalytic converter, muffler, etc.
	engine lubrication and cooling system	Oil pan, oil pump, oil strainer, oil filter, radiator, water pump, thermostat, cooling air fan, cooling air fan drive device, etc.)
	auto electric system	Ignition coil, spark plug, starter, alternator, etc.
	powertrain	Clutch cover, Clutch disk, Clutch fusing, Clutch master cylinder, Clutch release cylinder, MT, MTshift lever, shift fork, Synchronizing, AT, AT(automatic) shift lever(automatic transmission rod), AT(automatic)) Control Table, Transfer, Differential (shift gear), CVT (continuous variable transmission), hydraulic torque converter, etc.)

Material changed parts (light weight)	body (outer plate)	Outer plate → Made of aluminum, resin-based materials, etc.
	exterior	The tailgate and sunroof are made of resin material.
	interior	Driver's seat display, rearview mirror, side mirror, etc. → LCD

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Changes in auto parts due to the transition to future vehicles (electric vehicles)

Change	Classification	Auto parts
Increased parts	EV	Batteries (lithium ion batteries), driving motors, inverters, DC-DC converters, integrated control ECUs, electric vehicle speed reducers, vehicle charging devices, etc.
	PHV·HV: Transmission	
	Fuel cell vehicle (FCV, hydrogen vehicle)	Driving motor, fuel cell stack, high-pressure hydrogen tank, hydrogen injector, hydrogen sensor, valve, etc.
	Driving assistance system (ADAS) • Autonomous driving: sensors (LiDAR, image sensor, human machine interface, etc.)	

- New automobile parts according to the transition to future vehicles (electric vehicles) - Battery, motor, inverter, converter, ECU for integrated control, reducer for electric vehicle, vehicle charging device, sensors such as LiDAR required for autonomous vehicle, driving support system
 - Electronic components will not be supplied by existing auto parts companies, but by companies in other technical fields such as electronics and chemical companies.

Aspects of changes by parts and items following the transition to electric vehicles and future cars

Classification	Items	Number of Companies (%)	Number of workers (%)	Classification	Number of internal combustion engine parts	Number of vanished parts	Proportion (%)
Decreasing group	Engine parts, power transmission, electrical equipment	4195 (46.8%)	1080 thousand (47.4%)	Total	30000	11000	37
Maintaining group	Steering, suspension, braking, body, seat, air conditioning, etc.	4561 (50.9%)	1110 thousand (48.7%)	Engine	6000	6000	100
Expanding group	Major parts of future cars (various electric fields, batteries, etc.)	210 (2.3%)	9 thousand (3.9%)	drive, transmission device	5700	2100	37
* In the electric field sector, there is a mixture of reduced group (about 70%, internal combustion engine: only) and expanded group (about 30%, electric vehicle use).				Electronic parts for internal combustion engines	3000	2100	70
				car body, etc.	14400	-	-

Source: Joint government ministries, 2021.6. Strategies to support the transition of automobile parts companies to future vehicles

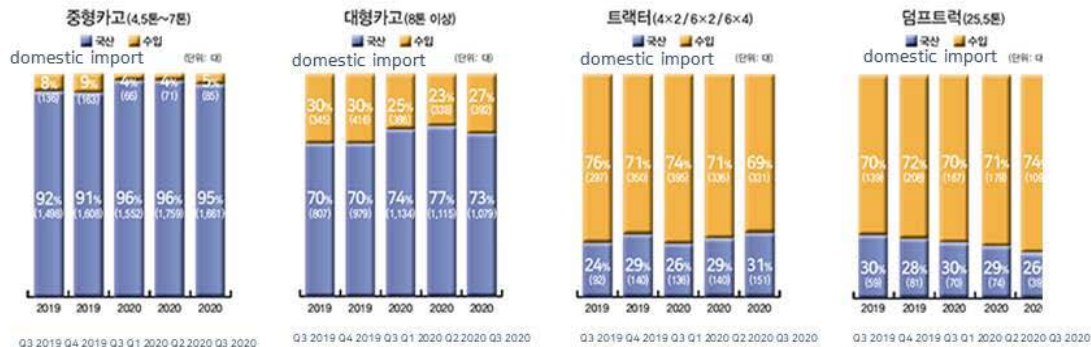
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Medium-to-large trucks and medium-large buses (commercial vehicles) in Korea

Share of domestic and imported mid-large trucks by quarter in 2019-2020

(Unit: car)



New registration number of medium and large buses (over 9m in total length)

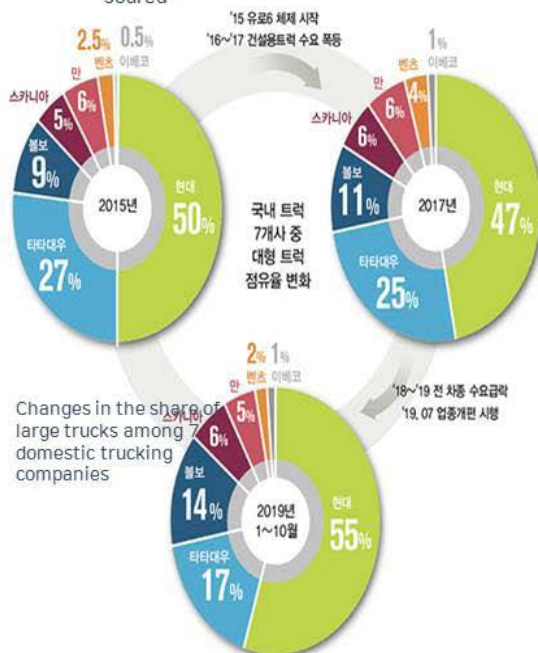
Bus	Company	2018	2019	fluctuation	Share
Express	Domestic				
	Hyundai	1,855	1,798	▼57(-3.1%)	51%
	Kia	1,293	1,351	▲58(4.8%)	38%
	Zyle Daewoo	335	377	▲42(12.5%)	11%
Urban	Sub Total	3,483	3,526	▲43(1.2%)	100%
	Domestic				
	Hyundai	3,565	3,129	▼436(-12.2%)	71%
	Zyle Daewoo	998	788	▼210(-21%)	18%
	Edison	96	220	▲124(129%)	5%
	Wujin Sanjeon	13	47	▲34(261%)	1%
	JeilJeil	-	15	-	0.4%
	Volvo	44	48	▲4(9.1%)	1.1%
	Photon	-	40	-	1%
	Haiger	12	39	▲27(225%)	0.9%
	Man	85	39	▼46(-54.1%)	0.9%
	Nanjing Jinrong	-	17	-	0.4%
	Jungtong	30	10	▼20(-66.6%)	0.2%
	Ankai	-	3	-	0.1%
	Sub Total	4,843	4,395	▼448(-9.3%)	100%
Total		8,326	7,921	▼405(-4.8%)	100%

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Market share of each company in the Korean commercial vehicle market

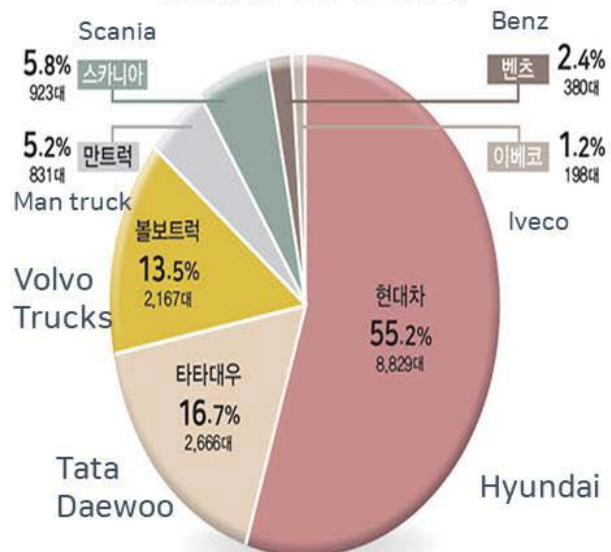
2015 Euro 6 system started
2016-2017 Demand for construction trucks soared



Market share by mid-to-large truck brand in 2019
Medium-large cargo (4.5 tons or more), tractors, dump trucks (25.5 tons or more)

2019년 중대형트럭 브랜드별 점유율

■ 중대형카고(4.5톤 이상) ■ 트랙터 ■ 덤프트럭(25.5톤 이상)



Demand for all car models in 2018-2019 plunged
Implemented industry reorganization in July 2019

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Current status of commercial vehicle/parts companies in Jeonbuk and the central government's commercial vehicle plan

Production and Employment Status of Commercial Vehicles in Jeonbuk

	Commercial vehicle production	Ratio of production of medium and large commercial vehicles nationwide	Number of employees	Jeonbuk's Exports
2013	72,204	95%	26,186	\$ 10.116 billion
2020	39,934	95%	21,659	\$ 5.842 billion
Change	- 39,934 - 45%	0%	- 4,527 - 17.3%	- \$ 4.274 billion - 42.25%

Source: Yoo Jun, 2021.9, The reality of the commercial vehicle industry through the activities of the Commercial Vehicle Countermeasures Committee

Material status of commercial vehicle parts makers in Jeonbuk

Source: Jeonbuk, 2020.

	Wansan	Gunsan	Jeonju	Iksan	Gimje	Other	Total
Commercial vehicle completion	Hyundai Motors	tata Daewoo					
Parts of commercial vehicle	46	37	11	40	19	7	160

Jeonbuk Commercial Vehicle Industry
Development Council Labor-Management
Tripartite Council



Dec. 2020 "Jeonbuk Commercial Vehicle Industry Development Council" formed
By July 21, 2021, four meetings were held to prepare measures to overcome the crisis in the Jeonbuk commercial vehicle industry and to discuss "plans to promote the revitalization of the commercial vehicle industry"

(Specially equipped vehicles) Fostering specialized remodeling companies such as hydrogen cleaners and water sprinklers through national projects

*Technology development and demonstration: (5 cylinders hydrogen cleaning vehicle) 2017~2021 KRW 8 billion / (10 ton hydrogen water sprinkler vehicle) 8.3 billion KRW in 2021

*Compulsory purchase of public institutions:
Hydrogen cleaning and watering vehicles are
included in the mandatory purchase of eco-
friendly vehicles -> Creation of public demand

Conversion of parts companies to future cars (central government)

Jeollabuk-do
electric vehicle parts
Eco-friendly commercial
vehicle
(local government)
Automobile-parts company
consultative body operation
(automobile company)
Part demonstration, big data
analysis
(Convergence Technology
Institute)
Development of eco-friendly
parts for trucks, buses, and
special vehicles
(Green Car Promotion Agency)
Technical support, human
resource training



Limitations of JIAT without a commercial electric vehicle plan of Jeonbuk

구분	사업명	사업기간	사업비(억원)	사업내용
기술개발 (5개 과제)	187개 과제		10,265 (국비 7812 지방비 1357, 민간 1096)	
	먼간 상생협력형 단기 부품 기술개발	22.1 ~ 24.12월	240 (지방비 120, 민간 120)	즉각적인 사업화가 가능한 수요기반형 상용차 부품 기술개발
	전북형 30대 핵심부품 및 소재 기술개발	22.1 ~ 24.12월	120 (지방비 90, 민간 30)	전라북도 대표 30대 전략품목을 선정하여 핵심부품 기술개발
	전기차 스케이트보드 개발 및 공동 활용 사업	22.1 ~ 25.12월	420 (국비 290, 민간 130)	스케이트보드 공용화물트럭, 오토부품 개발과 공동활용 기반 조성
	상용차부품 11개 기술개발 (상용차 예타사업)	22.1 ~ 24.12월	588 (국비 418, 민간 169)	국산화 필요 기술 및 전기·수소차량 등 미래차 대응기타 개발
	상용차 부품기업 등 지역기업 기술개발 지원	22.1 ~ 24.12월	105 (국비 75, 민간 30)	전기·수소 동력화물트럭, 3D 프린팅 활용 금속 및 복합재 성형 기술개발 등
	상용차 품질적 강화를 위한 품질 리서치	22.1 ~ 26.12월	1 (지방비 1)	국내 상용차의 기술수준, 품질 및 소비자 인식 등의 설문 및 분석
	기타품 원장 예로 해결 지원사업	22.1 ~ 24.12월	111 (지방비 97, 민간 14)	공정개선, 스마트 공정 자동화, 물류비 지원, 홍보 및 마케팅, 컨설팅 지원 등
	미래기술 확보를 위한 기술교류 및 연구개발	22.1 ~ 24.12월	24 (지방비 15)	수혜기업 맞춤형, 도제식 인력양성, 연구개발/생산인력양성 지원 등
	경원발전자금(운전자금) 지원	22.1 ~ 23.12월	140 (지방비 150)	아차보전지원율상위 기업 2.0% 우대기업 3.2%
기업지원 (9개 과제)	성원 모빌리티 기술혁신도 제고 및 신시장 창출 지원사업	22.1 ~ 24.12월	180 (국비 180)	기술고도화 및 시장다각화 전주기 지원, 신시장 창출 전주기 파견 등
	스마트공장 구축 및 고도화	22.1 ~ 24.12월	744 (국비 62, 지방비 12, 민간 34)	IoT, 5G 백본과 등 첨단기술을 적용한 스마트공장 솔루션 구축 지원
	기타기업 차량 설계 FREE 지역 체계 구축 및 운영	22.1 ~ 26.12월	20 (지방비 10, 민간 10)	미래형 차량을 개발한 도제기업과 수요자를 연결하여 상품 추진
	LNG 상용차 보급 및 활성화 지원사업	22.1 ~ 24.12월	30 (지방비 30)	LNG 상용차의 보급 확대를 위해 보급 정책 수립 및 차종 다각화 기술개발 추진
	수소상용차 보급 및 활성화 지원사업	22.1 ~ 30.12월	별도예산	(국비 0원 ~ 22 수소 충전소 2개, 수소버스 20대 보급, (세 0원 ~ 30 수소 충전소 2개, 수소버스 40대 보급)
	수소상용차 전용화물트럭 고도화 연구센터구축	22.1 ~ 25.12월	235 (국비 100, 지방비 135)	수소상용차 실차 기반 신뢰성 및 성능 검증 센터 건립 및 기술지원 등
	특장차 안전·신뢰성 향상 및 기술융합 기반구축사업	22.1 ~ 26.12월	297 (국비 18, 지방비 10, 민간 7)	특장차 안전·신뢰성 향상 지원을 위한 지원 기반 구축 등
	자동차 대차부품 글로벌 전진기지 구축	24.1 ~ 24.12월	2,000 (국비 128, 지방비 10, 민간 18)	자동차 대차부품 개발 및 생산기술 집적화(인자) 조성 등
	수소상용차 음복합	24.1 ~ 24.12월	5,000 (국비 500)	수소상용차 부품전자 대형 수소상용차 전용용량용 혁신소재 개발, 2개년 등
	수소터널 구축	24.1 ~ 24.12월	5,000 (국비 500)	수소상용차 부품전자 대형 수소상용차 전용용량용 혁신소재 개발, 2개년 등

Implications and Conclusions

Conversion of commercial vehicles to electric vehicles

- Not easy due to lack of technology and lack of investment
- Domestic (Jeonbuk) production of commercial vehicles cannot be abandoned
- Gwangju-type jobs - New automobile production vs. Jeonju commercial vehicle conversion and maintenance (?)

Jeonbuk (Wanju-gun) must work hard

- Jeollabuk-do (Wanju-gun, Gunsan/Isan-si) must take an active role in maintaining frequent users, the core of Jeollabuk-do jobs
- Gunsan GM Korea learns to shut down Hyundai Heavy Industries plant
- Without the efforts of Jeollabuk-do (the relevant basic local government).....

Central government/Hyundai should move

- Central government/Hyundai should worry about commercial vehicles
- Provide incentives for central government/Hyundai Motors to invest in commercial electric vehicles
- One choice determines the next 20 to 30 years

Jeonbuk/union/parts companies need to think

- It is necessary to find incentives to invest in commercial electric vehicles amid uncertainty and difficulties
- Agreement and implementation guaranteed through the Jeonbuk tripartite council
- Future Sustainable Development Model

Jeonbuk as South Korea's commercial electric vehicle base

- Maintaining Jeonbuk's manufacturing base and good jobs
- Continuous investment in commercial electric vehicles and parts in Jeonbuk

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KLI 한국노동연구원

Thank you

The 7th
International Conference
on the **Economics**
of **Happiness Jeonju**

Climate Crisis and Localization

기후위기와 지역화

