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A Just Transition to a Carbon-Neutral Society to Respond to the Climate Crisis—Centered on the workers

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Abstract: The entire process of implementing carbon neutrality in response to the climate crisis should lay a just foundation for transformation for the socially disadvantaged. This requires the establishment of governance that will enable a just transition to carbon neutrality, and the education and promotion of carbon neutral green growth that citizens, including workers, can understand and practice. Responding to the climate crisis has become an important trend for human survival, and the transition to energy-low-consumption industries and low-carbon economies to respond to climate change is becoming an important variable in industry and labor. In the process of re-forming the structure of the power and energy industry for the transition to a carbon-neutral society, the participation of stakeholders, including labor, is urgently needed. Conversion governance should be studied in various aspects, including social dialogue, industry-level collective bargaining, and corporate-level joint decisions, but this study proposes a just transition to a carbon-neutral society centered on social dialogue. In order to realize social dialogue in the process of responding to the climate crisis, there must be a vast amount of education led by public-private academic institutions, such as discussions and civil society meetings, based on social unionism.

Keywords: climate crisis; Response; Carbon-neutral transition; disadvantaged; Just Transition; Governance; Worker; citizen; Green Growth; Education

1. Introduction

In the process of responding to the climate crisis, there are arguments that distrust social dialogue. There are two reasons. One is that responding to the climate crisis requires de-growth, and even a shift in the capitalist system, and asks, 'Can social dialogue achieve a shift in the system?' This is because social dialogue essentially makes decisions based on compromises between stakeholders. The other is the question, 'Is social dialogue possible in Korea?'. The difference in views on social dialogue stems from the difference in interpretation of "how to define a just transition." Social dialogue cannot be a useful means if a just transition is understood as a way to realize ecological socialism or as a transition to a capitalist system. However, if a just transition aims for structural reform based on a "shared solution," social dialogue becomes an essential means[1]. The latter is also the basis adopted by the Korean government's New Deal policy or the Framework Act on Carbon Neutrality, as well as countries in the European Union (EU).

1.2. Is social dialogue appropriate as a countermeasure to the climate crisis

The pros and cons of the role of social dialogue in the process of responding to the climate crisis are mixed. The International Labor Organization (ILO)[2], a social dialogue organization, actively evaluates social dialogue as a stepping stone for a just transition. A strong social consensus on the goal of sustainability and the path of implementation is fundamental. Social dialogue should be an essential part of the institutional framework

for policymaking and implementation at all levels. Adequate and informed, ongoing consultations must take place with all relevant stakeholders involved. The International Federation of Trade Unions, the United Nations Environment Program, and the World Health Organization all emphasize trilateralism in which labor participates in the process of responding to the climate crisis. By setting the union as the subject of responding to the climate crisis through social dialogue, it is possible to resolve social conflicts and further realize a just transition[1].

An official from the Korean Confederation of Trade Unions said, "The carbon-neutral ordinance realizes a just transition to protect vulnerable classes, sectors, and regions that may be damaged in the process of transitioning to a carbon-neutral society." However, with the enactment of the ordinance, I do not know how sufficiently the opinions of the parties have been reflected for the just transition of the residents of the classes, sectors and regions that could be harmed by carbon neutrality. The labor community criticized him for never giving an opinion[3].

2. Trade Union Challenges for a Just Transition

The labor union's tasks for a just transition are as follows[1]. First, by revising the Framework Act on Carbon Neutral and enacting a just transition law as an implementation law, a just transition promotion system should be established and participation of stakeholder representatives, including workers, in various levels of decision-making structures and processes.

Second, the revision of the Framework Ordinance on Carbon Neutrality of Local Governments and the establishment of just conversion-related ordinances and conversion funds. Through the enactment of separate ordinances related to operation, a legal and institutional foundation such as the establishment of an implementation system and the creation of funds to realize a just transition at the regional level should be established.

Third, it is necessary to demand, continuously monitor, and utilize the items delegated by ordinances to find policies suitable for local conditions, create best practices for just transformation involving workers and local residents, and share experiences to spread to other regions.

Fourth, unions should establish a regional governance system to issue just transformation, analyze the impact of carbon neutrality on the region's industrial structure, and seek new industrial policy interventions that can shift to business diversification.

Fifth, trade unions in areas where exit and transformation industries are concentrated should urgently address the issue of responding to the climate crisis as a bargaining agenda.

Sixth, the environment for the realization of a just transition. It is necessary to strengthen solidarity with civic groups and vulnerable groups in the climate crisis.

3. The Framework Act on Carbon Neutrality and the Just Transition

Korea became the 14th country in the world to legislate 2050 carbon neutrality and mid- to long-term greenhouse gas reduction goals with the enactment of the Framework Act on Carbon Neutrality and Green Growth to Respond to the Climate Crisis[4]. Through the Framework Act on Carbon Neutrality, the purpose of responding to the climate crisis and implementing carbon neutrality was clarified, and the 2050 carbon neutral goal and the raised mid- to long-term greenhouse gas reduction goal were set.

Figure 1. The EU Climate and Energy Goals

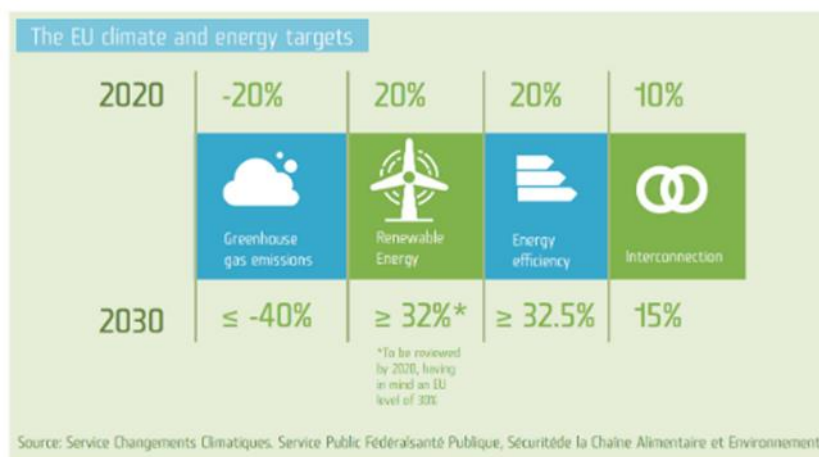
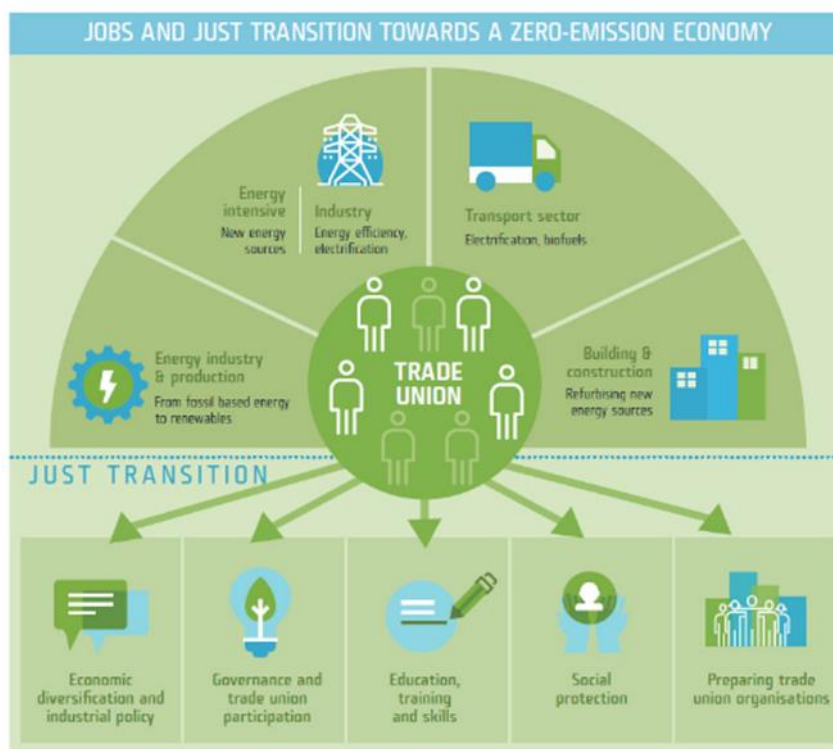


Figure 2. JOBS AND JUST TRANSITION TOWARDS A ZERO-EMISSION ECONOMY



The Framework Act on Carbon Neutral aims to improve the quality of life of current and future generations and to protect the international ecosystem by strengthening measures to reduce greenhouse gases and adapt to the climate crisis, addressing economic, environmental, and social inequality. In addition, the government has set a mid-to long-term national greenhouse gas reduction goal of reducing national greenhouse gas emissions by 40% of national greenhouse gas emissions in 2018.

The discourse, which is mainly discussed as the union's response strategy to the climate crisis, is a just transition. The just transition was a trade union requirement in the United States in the 1980s to help workers who lost their jobs due to stricter environmental regulations make a living outside the polluting industry and get decent jobs. In the 2000s, it was included in the 2015 Paris Climate Change Convention and the UN's Sustainable

Development Goals through continuous efforts by international labor movement organizations, including the International Trade Union (ITUC), and recently social. It is expanding into a social strategy to resolve economic inequality [5].

Table 1. Provisions on the Just Transition of the Framework Act on Carbon Neutrality

(Provided by the Federation of Korean Trade Unions Central Research Institute[6])

condolences	Substantial Definition Related Content	Procedural Definition Related Content
Purpose (Article 1)	- Resolving economic, environmental, and social inequality that may arise in the process of transitioning to a carbon-neutral society	
Definition (Article 2)	- Climate justice, just transition, and green growth fundamentals	
Principles (Article 3)	-Establishing a just transition, implementing the principle of polluter burden, and using it as an opportunity to create jobs	-Guaranteed democratic participation of all citizens
Responsibilities of the State and local governments (Article 4)	- Efforts shall be made to reflect the basic principles under Article 3 in all sectors, including economy, society, education, and culture - Protecting people's safety and property from the climate crisis in accordance with the principles of climate justice and just transformation	- Provide transparent information to the public and business operators and ensure that they can actively participate and cooperate in the decision-making process
Establishment and implementation of the National Carbon-Neutral Green Growth Basic Plan (Article 10)	- In accordance with the basic principles of Article 3, the government establishes 20 years as a planned period every five years to achieve national vision and mid- to long-term reduction goals. Enforcement -Including National Basic Plan: Matters concerning just transition	
Establishment of Local Government Plans, etc. (Articles 11 and 12)	- Established every five years with a 10-year planning period in consideration of the national basic plan, the higher-level local government plan, and the regional characteristics of the jurisdiction. Enforcement	
Inspection of the progress of the National Basic Plan, etc. (Article 13)	- Every year, the progress of the basic plan and major achievements are carefully performed. Quantitative inspection, resulting in a report	
2050 Establishment of the Carbon Neutral Green Growth Committee (Article 15)		- Deliberation on major policies and plans for the government's transition to a carbon-neutral society and the promotion of green growth, as well as matters related to its implementation. Established as a

		<p>member of the President for a resolution</p> <p>-Composition of the Committee: a person commissioned by the President from among persons with abundant knowledge and experience in the fields of climate science,..., just transition, etc. When commissioning members, the representation of each social class shall be reflected after receiving recommendations or hearing opinions from various social classes, such as youth, women, workers, farmers and fishermen, small and medium-sized business owners, and civil society organizations.</p>
2050 Organization and Operation of Local Carbon-Neutral Green Growth Committee (Article 22)		- Deliberation on major policies and plans for the transition of local governments to a carbon-neutral society and the promotion of green growth, as well as matters concerning their implementation. It can be placed by local governments for resolution.
Just Transition (Chapter 7 Articles 47 to 53)	- Establishment of a social safety net for climate crisis, designation of a special zone for just transformation, support for business transformation, minimization of risk of asset loss, etc., revitalization of cooperatives, establishment of a just transition support center, etc.	- Support to ensure public participation
Use of the Climate Response Fund (Article 70)	<p>- Support for industrial, labor, and regional economic transformation</p> <p>- Support for job conversion and creation in areas where economic and social conditions have deteriorated in the process of responding to the climate crisis or for workers and classes affected by the crisis</p>	

4. The impact of climate change on labor (climate change and change in the labor market)

We are already experiencing climate change itself and its direct and indirect economic impact. Extreme climate events such as typhoons, rainy seasons that have become difficult to predict, and more frequent and prolonged heat waves and cold weather will disrupt economic activity and weaken the industry's position[7]. On the other hand, greenhouse gas reduction policies to mitigate climate change are likely to raise energy prices, dampen the economy and force the reorganization of the energy-intensive industry

structure. In accordance with climate change, the industry will be required to change for various reasons, including transnational demands such as international regulations and norms, national policies, and changes according to climate change itself.

Various policies related to climate change also affect the labor market in various ways. First of all, climate change itself may change the production conditions of products or change productivity[8]. Examples are environmental changes experienced by industries with a lot of outdoor work, such as the construction and shipbuilding industries, and agriculture, forestry and fisheries, where prices of raw materials such as fuel rise or harvest decreases due to weather fluctuations[8]. However, the flow of changing consumer behavior as the public's perception of climate change changes and related marketing grows affects production and the labor market in the long run. The production and consumption of green products, eco-friendly products, or energy-saving vehicles are induced. When the "green product" market is created and matured, companies will also enter the green market.

More importantly, the regulations introduced in connection with the Climate Change Convention. These include traditional regulatory policies (imposition of emission standards, public education, etc.), carbon pricing (carbon taxes, emission trading systems), and innovation policies (knowledge management, adaptation support). In addition, the impact on the labor market in the non-manufacturing sector is gradually expanding, such as the transfer of technologies related to climate change to underdeveloped countries, the power generation difference support system to support the supply of renewable energy[9].

The mid- to long-term effects of climate change on employment will not occur uniformly simply due to rising temperatures[10]. Although it will directly affect agricultural and forestry harvests in some areas, extreme climate events such as droughts, tropical storms, floods, and rising sea levels are likely to have a direct or indirect negative impact on employment. In addition, factories and jobs can be relocated as a result of the urban infrastructure.

Greening the economy and industry will affect many economic sectors and create entirely new jobs. This transition is expected to benefit companies operating in the environmental sector in particular. The transition is also expected to pose some new risks, as in the carbon-intensive industry. These risks could be attributed to lower demand for certain products, higher investment to cope with stricter environmental standards, and higher carbon prices[11].

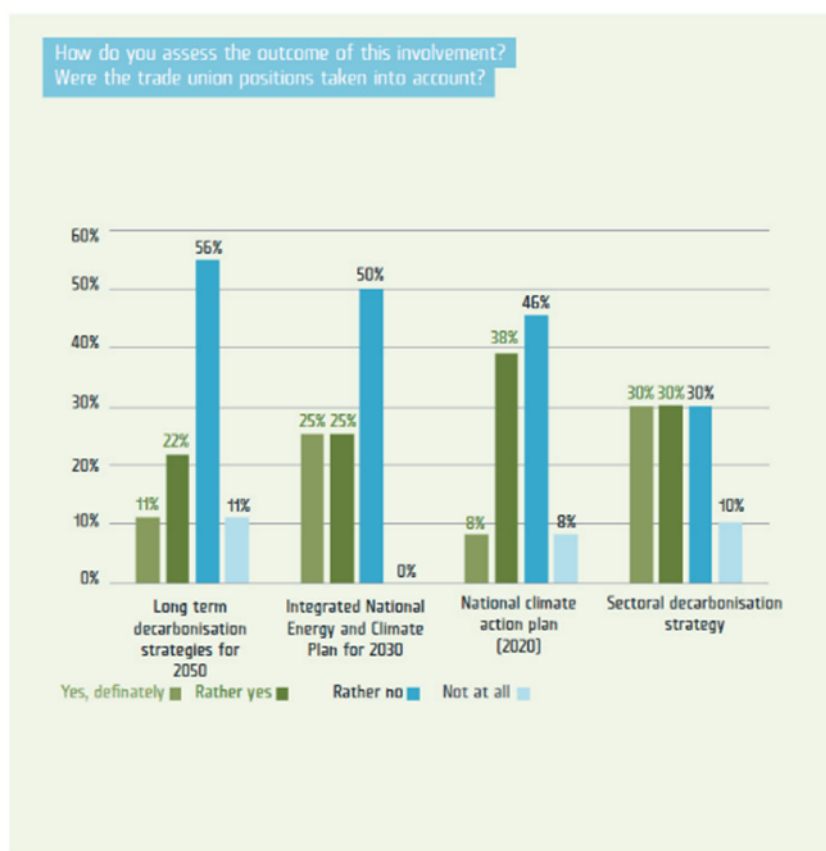
When transitioning to a green economy as a result of the process and results of responding to climate change, the green industry and green jobs have several paths such as creation, extinction, and replacement. New sectors and industries may emerge, some of the existing non-green industries may become "green," and some of the existing jobs may disappear[12]. Therefore, it can be argued that the creation of a green economy can create green jobs, reducing unemployment and increasing employment, but structurally, such a hopeful outlook is not the only one[13].

The level of union participation varies widely across Europe. In many cases, consultations take place through a trilateral organization that can be formed permanently or temporarily[14]. In some countries, a particular organization includes trade unions, along with all other stakeholders. In France, for example, the National Commission for Ecological Transformation (CNTE) is a dialogue forum on ecological transformation and sustainable development[15]. The committee, chaired by the Minister of Ecology, brings together NGOs, social partners, experts, local governments and lawmakers to provide important advice on draft legislation on the environment and energy. Other examples of large-scale forums include Germany (a consultation held within the framework of the Climate Action Plan 2050) and the Netherlands (National and Regional Energy Conventions). In some cases, it consults with trade unions at sector level, as in Belgium's 2050 scenario development[16]. Finally, other forms of participation include advisory groups (Belgium, Denmark, Ireland and Sweden parliamentary expert groups) meetings, specific workshops (Finland) and requests for entry in writing (Poland).6. Conclusions

In conclusion, the central government should implement active support and response measures to protect the vulnerable populations, promote policies, and improve crisis management communication to ensure a safe community, slow the spread of COVID-19, and alleviate the anxiety of the national population.

Further, identifying an evidence-based method to understand and address the psychological and social influences of COVID-19, such as excessive fear (or apathy or adequate attention) and discrimination, is crucial [128–130]. Analysis of public anxiety and danger awareness will provide insight regarding future risk factors for policy makers and assist in the optimization of potential and sustainable public health communication strategies [131–133].

Figure 3. How do you assess the outcome of this involvement? Were the trade union positions taken into account?



There is no just transition without worker participation. From this point of view, the key is to ensure a "just transition" of the labor force and the creation of quality jobs in accordance with the UN's 2030 sustainable development agenda[17]. Therefore, union participation in governance in the policy process is particularly important. This importance was emphasized at both international and European levels. The full text of the Paris Agreement urges the parties to "consider the need for a just transition of the labor force," which clearly calls for workers' participation. The ILO guidelines "for an environmentally sustainable economy for all and a just transition to a society" recommend consultation and connection with trade unions at "all possible levels and stages" in shaping and implementing low-carbon policies.²⁵ In the "Energy Union Package" of 2015, the European Commission emphasized the importance of the role of social partners and made them include energy transitions in their social dialogue. Even though trade unions have campaigned for years for a just transition for workers, the meaning of the deep-decarbon state promised in Paris is not always known and understood[18]. Similarly, it would mean

becoming familiar to stakeholders to contribute to the importance of the emerging governance system. Based on several ETUC projects (26) driven for the development of climate change policies, the guide's two main objectives are to inform European trade unions of what the Paris Agreement and related EU legislation mean, and to prepare them to play an active role in the development and design of a just transition framework[19].

5. Prospects of Labor Impact from Carbon Neutrality

The government diagnoses that the stagnation and reduction of the high-carbon and labor-intensive industries are becoming visible at a time when carbon neutrality and digitalization are in progress. According to the government's prediction, 28 coal-fired power plants will be abolished (24th LNG conversion) by 2034. In the automobile industry, the proportion of new hydrogen and electric vehicle sales is also expected to increase from 2.8% in 2020 to 18.3% in 2025 and to 33.3% in 2030. If you respond lukewarmly to this trend, you are concerned about delays in the transition of economic and industrial structures, increased structural unemployment, and social conflicts[20].

Accordingly, the government formed a T/F with related ministries and national research institutes to predict and analyze the impact of low carbon and digitalization on major industries. Job prospects for each industry were derived through the discussion of the "Labor Conversion Support TF" involving related ministries (employment, industry, science, environment, materials) and research institutes (labor, industry, energy, environmental research institutes, etc.) from March to May. According to this, low-carbon and digitalization have different conversion speeds, sizes, and methods for each industry, so the impact on jobs in each industry is expected to be different. New jobs are expected to be created in new industries such as renewable energy, climate industry, and circular economy, but labor conversion is expected to occur relatively soon in the internal combustion engine automobile and coal-fired power generation sectors. In the case of steel, petrochemical, cement, oil refining, semiconductor, and display industries, labor conversion is expected to occur in the mid- to long-term as it takes a certain period of time to improve raw materials and processes to reduce carbon[21].

The impact of the climate crisis and response on regions and industries needs to be diagnosed and preliminary, much more specific than the government's general expectations, and based on regional history, resources, and context[22]. A recent study conducted by the Chungnam Research Institute gives a three-dimensional look at the future of the closure and conversion of coal-fired power plants in the region.

According to this, the phased closure of coal-fired power plants and the community impact vary in time and space. Cities and counties, where coal-fired power plants account for a large portion of the local economy, jobs, and population, are hit hard by the closure of coal-fired power plants[23]. In addition, since the closure of coal-fired power plants varies from city to county, there may be differences in the preparation period by city and county, but systematic preparation is needed as soon as possible because regional transformation is difficult to achieve in a short period of time.

In the past, Korean governments promoted green growth and greenhouse gas reduction policies, but actually had no awareness of the problem of a just transition. Under the Moon Jae In government, the concept began to appear in government documents as the expression of "fair transition" in policies such as the Korean version of the New Deal. However, this narrows the original context of the concept to procedural fairness, that is, not illegal or to provide adequate compensation and support afterwards[24].

Specific policy efforts have also been sluggish, and the Korean version of the Green New Deal plan has not presented detailed measures to realize fair conversion, and only corporate support measures are being discussed as follow-up supplementary projects. Even in the 100-member "carbon neutral committee," a just transition is entrusted as a task of a subcommittee called "fair transition," and dozens of businessmen participate as members, while only one worker is the chairman of the Federation of Korean Trade Unions[25]. However, Chungnam, where coal-fired power generation is concentrated, Jeonnam, Geoje,

and Ulsan, where many steel and shipbuilding industries are located, are areas with very high "climate risks." In addition, companies and regions that rely heavily on internal combustion engine car production and nuclear power plant equipment need to prepare for rapid transition.

6. Conclusions

In the era of great transformation, it is the response to the climate crisis that leads to a complex transition. Combined with digital transformation or pandemic, it brings a climate crisis spiral to our society, just as typhoons combine to add power. Climate disaster is not an exception for workers, but it is a daily life and survival problem for all of us. However, the climate crisis goes beyond "disaster" in that it brings about "transformation." It will change the "world of work" as a whole, including industrial organizations, competitive structures, production methods, working organizations and working environments, and labor-management relations, as well as job security (and smooth job conversion).

The carbon neutrality policy will make a big difference in Korea's industry and labor, and the results are hard to predict. But one thing is clear: the results depend on how we respond. Therefore, union participation and intervention in the process of responding to the climate crisis are important. Otherwise, damage such as job shocks caused by the conversion of decarbonization circuits will be unilaterally passed on to workers and the vulnerable, and social, economic, and environmental inequality will intensify.

The realization of a just transition can be developed at various levels, such as the national level, the industrial and regional level, and the corporate level. The four key elements for a just transition are strong government support, sufficient support, stakeholder cooperation, and economic diversification (transition to an alternative economy of fossil fuels) (Morello-Frosch, 2019). In carbon neutrality, the government should implement a transition policy that encompasses all sectors, including industry, environment, labor, and citizens, so that no one lags behind as a just transition control tower. At that time, a just transition to save both the economy, labor and climate will be possible.

For this, democratic participation and consultation processes are needed above all else. In other words, through multi-layered social dialogue and collective bargaining, the agenda for realizing carbon neutrality and just transition should be publicized, and policy alternatives should be derived through this process. The coal-fired power generation sector can be said to be at the forefront of responding to the climate crisis. In this respect, the union's response strategy to the closure of coal-fired power plants means forming the union's strategic model for the climate crisis. In addition, if the transition to the energy sector is a task that will be underway for nearly 30 years, this strategy could be a touchstone for a long-term response. This is why active conversion strategies are also required for labor unions. The climate crisis is inherently unequal. The disasters caused by the climate crisis are unequal, and inequality is reproduced in the process of responding to the climate crisis. It is also classy in that it is repeated that workers and other socially disadvantaged people pay for it. Breaking off that inequality and class is a just transition and it presupposes the participation of the parties[7].

Discussions on just conversion support at the industrial level are also needed, and in the case of the coal-fired power generation sector, where coal-fired power plants are being closed, even a consultative council by industry involving stakeholders has not been formed. Since the region is directly hit, countermeasures should be prepared at the regional level. Chungcheongnam-do (coal-fired power generation, internal combustion engine, steel, cement), Ulsan (internal combustion engine, petrochemical), Gyeongsangnam-do (coal-fired power generation, internal combustion engine, steel), Gyeongsangbuk-do (steel), Jeollanam-do (petrochemical), Chungcheongbuk-do (cement), and Gyeonggi-do (cement)[26].

Trade unions in regions where exit and transformation industries are concentrated should urgently address the issue of responding to the climate crisis as a bargaining

agenda. In the process of industrial conversion and production change due to carbon neutral policies, employment insecurity may occur, and a decrease in volume may shorten working hours and negatively affect wages and working conditions. In order to prevent this and to lead to good jobs with carbon neutrality, the contents related to climate justice and labor conversion should be defined as collective agreements through negotiations. To this end, the union should identify specific changes in employment, working conditions, and skills in each department of the workplace and make measures to improve them a negotiating agenda.

The climate crisis is a matter of human survival and requires a very comprehensive response from the government and labor unions. Layered countermeasures should be urgently taken in all areas, including central, industrial, regional, and workplace. If the existing economic growth-oriented and unequal social and economic systems cannot be improved with a new system along with the great transformation of energy and industry, Korean society. The sustainability of the economy will be difficult to guarantee.

Author Contributions: Conceptualization, Y.J.C.; methodology, Y.J.C.; software, Y.J.C.; validation, Y.J.C.; formal analysis, Y.J.C.; investigation, Y.J.C.; resources, Y.J.C.; data curation Y.J.C.; writing—original draft, Y.J.C.; writing—review and editing, Y.J.C.; visualization, Y.J.C.; supervision.

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