Transition management with “Just Transition” in Japanese power sector

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"Decarbonization of power sector" is necessary to achieve the 80% emission reduction target.

Historical trend of Japan's energy-related CO2 emissions and the mitigation targets in Japan.

Electricity mix in 2050 under the scenario to achieve the 80% emission reduction.

出典：Kuriyama, et.al (2018)

出典：筆者作成
The importance of “Just Transition” and employment issues are recognized to achieve decarbonization of the power sector.

Japanese’s long-term strategy: Promoting local vocational training and measures for a smooth transition of the labour force to decarbonized to society with Government, local authorities and companies working together.

出典：Loorback D. et.al (2017)
The elements of “Just Transition”

1. **Distributional justice**: Identifying key impacts in terms of location and stakeholders

2. **Recognition justice**: Identifying key inequalities which will be caused or mitigated by a transition

3. **Procedural justice**: Securing fair process to deal with the impacts or inequalities caused by transition

出典：McCauley et al. (2019)  Energy justice in the transition to low carbon energy systems: Exploring key themes in interdisciplinary research
Key facts related a just transition towards decarbonizing the power sector in Japan
Fact ①: Locations of fossil-fuel power plants and renewable energy are different

The location of power plants would change owing to the decarbonization of the power sector.
Fact ②: Population and working-age population decreases in rural areas

The working-age population is directly linked to the vitalizing the local economy.

The ratio of total population decreases in each municipality.

Share of working-age population against total population in 2015 and 2045

出典：総務省（2015）日本統計地図
出典：国立社会保障・人口問題研究所（2015）日本の地域別将来推計人口を基に筆者作成

The working-age population is directly linked to the vitalizing the local economy.
Research questions on analysis for a just transition towards decarbonisation of the power sector

1. What is the impact of the decarbonisation of the power sector?
   => To identify impacts on employee and location by the decarbonization of the power sector
   => To identify impacts on the inequality of working-age distribution.

2. What kind of policy measures are needed for a smooth transition to decarbonisation in the power sector? (Transition management)
Decarbonisation of power sector brings increases of domestic direct and indirect employment
Maintenance work for renewable energy will increase in the Tokyo and Tohoku regions

Policy implications:
It is necessary to secure labour force who can engage in maintenance work for renewable energy.
Are these changes good for Japan?

• We analyze impacts on "local revitalization" which is one of the important policy issues.
• We used the ratio of the working-age population to the total population of each municipality as a regional revitalization index.
• We assumed that low inequality of the working-age population distribution is desirable=> Use Gini coefficient
Inequalities of working-age population distribution are improved, which contributes to vitalizing local economy.
Is it possible to achieve a smooth transition to decarbonisation of the power sector?

1. Which one of A and B decreases faster?

A: Natural reduction of employment due to retirement of engineers for conventional power plants

B: Decrease in engineers of conventional power generation in the decarbonization scenario

2. If B is faster than A, there will be surplus engineers, but what kind of policy measures can be taken?
In Japan as a whole, smooth phase-out from thermal power and nuclear power is possible, but there are surplus employers if we see regional impacts.
Surplus employers from conventional power plant has two options to find their new job.

(a) Find job in biomass and geothermal power plants
=> Use similar common skill but change job locations

(b) Find jobs in solar and wind power plant
=> Stay same regions but change the skill

Both needs a policy support
Conclusion: A Just transition to decarbonisation of the power sector is possible

High distribution and recognition justice

- Decarbonisation of the power sector will increase domestic employment (renewable maintenance work). As a result, it improves the inequality of working-age pop. distribution.

To ensure procedural justice, policy supports are needed

- Support for training new maintenance engineers who can support the increase of renewable energy
- Support for surplus engineers from thermal power plants
  => Early decision on the phase-out of conventional power plant will reduce the number of surplus engineers.
  => For surplus engineers, policy measures such as update of skills or change of residence are necessary.