

Transition management with “Just Transition” in Japanese power sector

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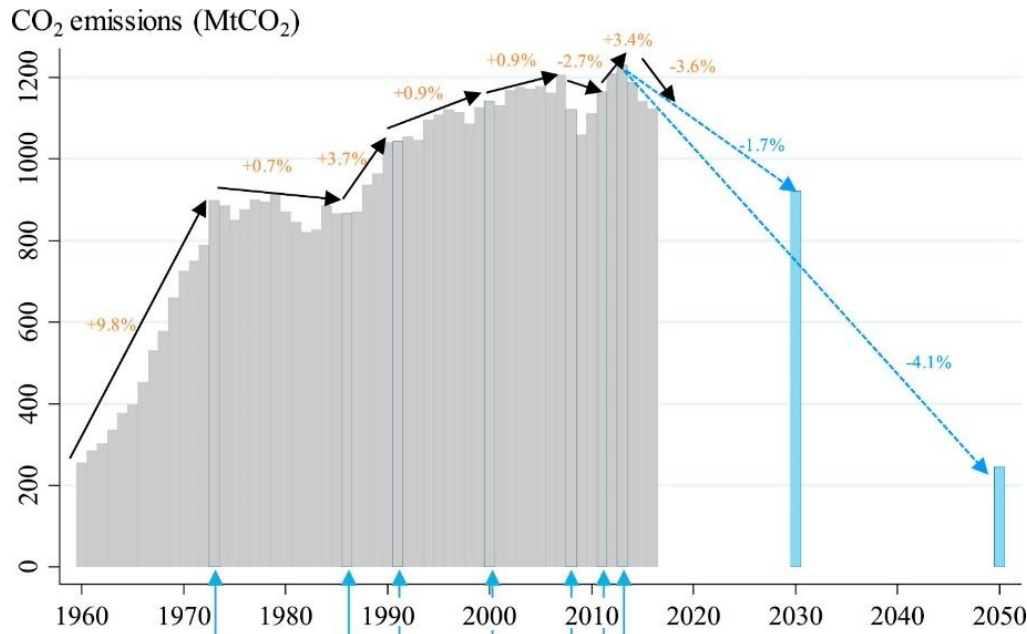


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持続可能なアジア太平洋に関する国際フォーラム
International Forum for Sustainable Asia and the Pacific

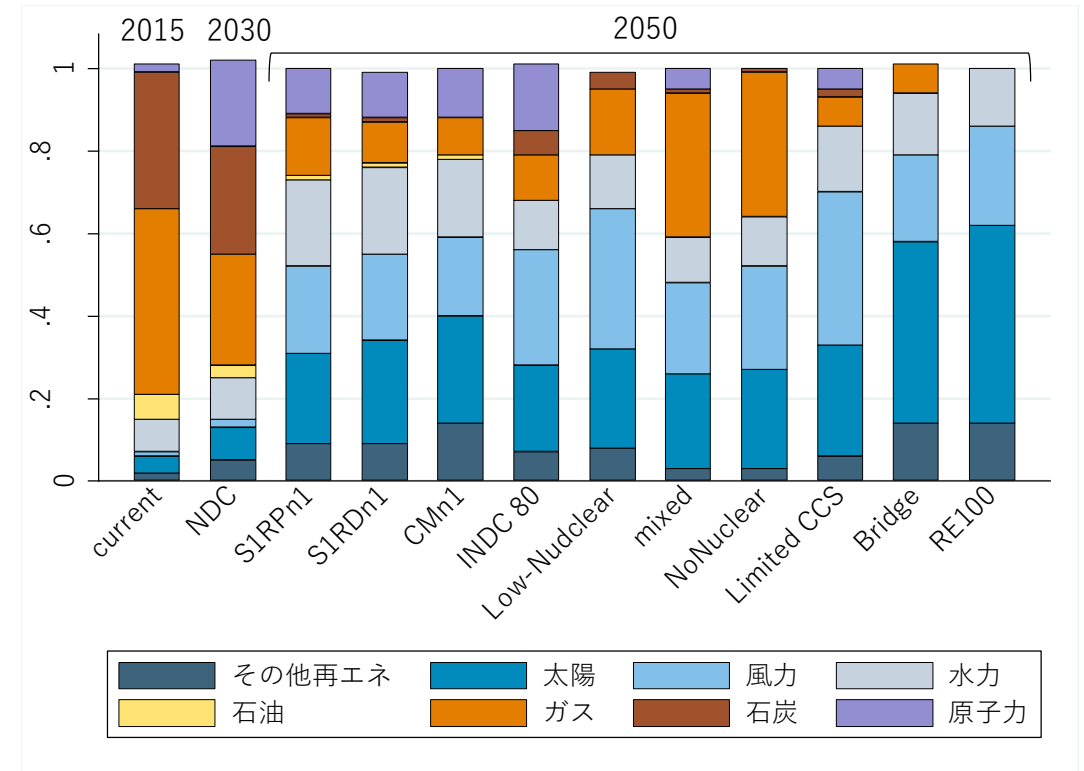
“Decarbonization of power sector” is necessary to achieve the 80% emission reduction target

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



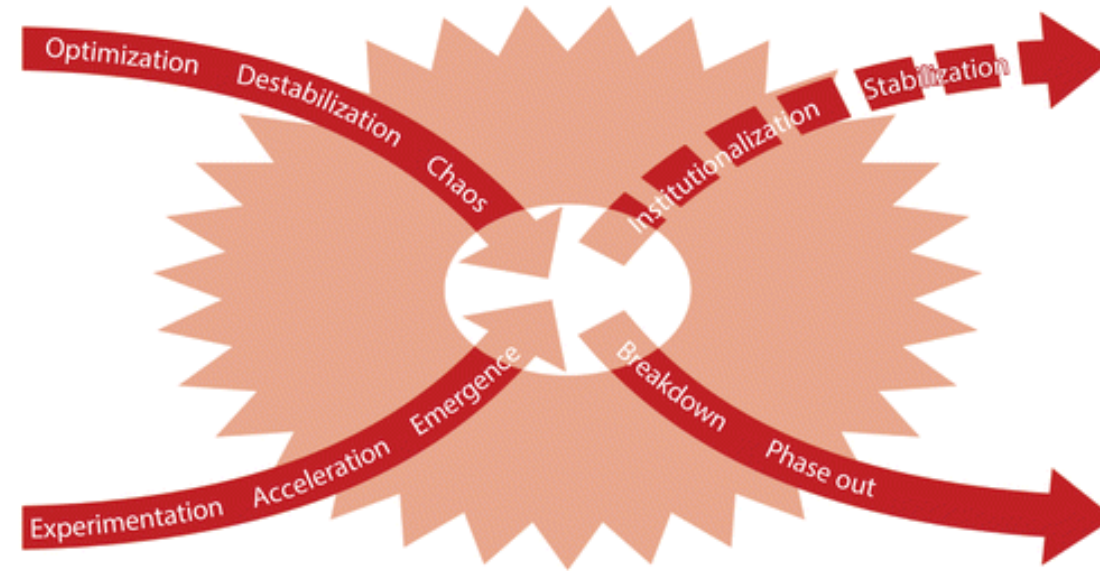
出典：Kuriyama, et.al (2018)

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



出典：筆者作成

The importance of “Just Transition” and employment issues are recognized to achieve decarbonization of the power sector



Loorbach D, et al. 2017.
Annu. Rev. Environ. Resour. 42:599–626

出典：Loorbach D. et.al (2017)

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

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 :**

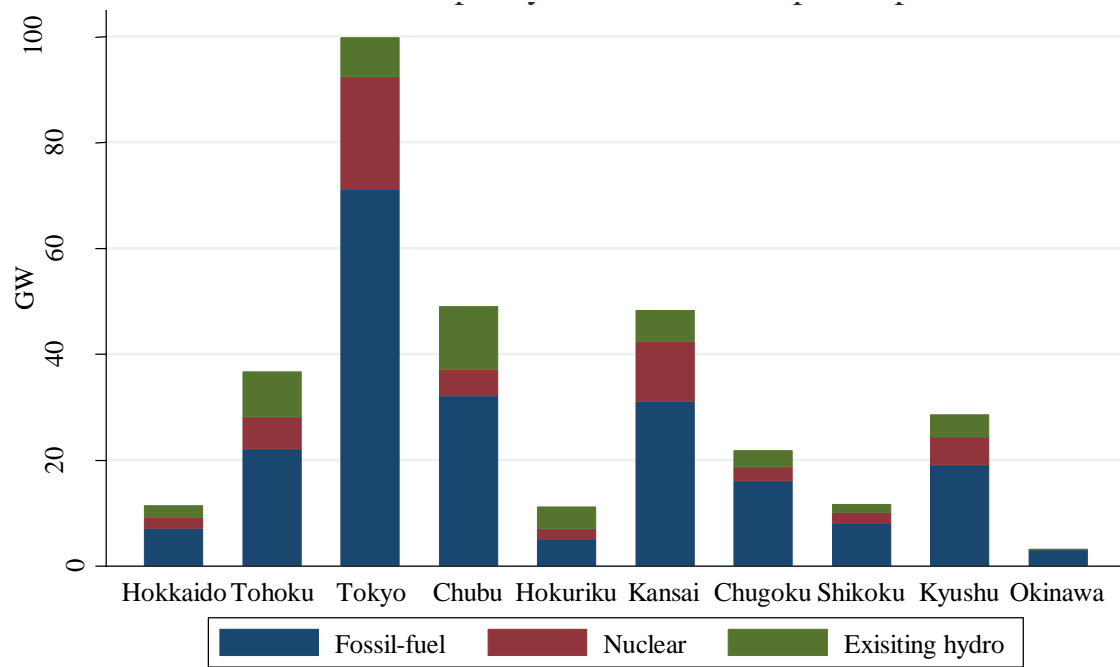
Securing fair process to deal with the impacts or inequalities caused by transition

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

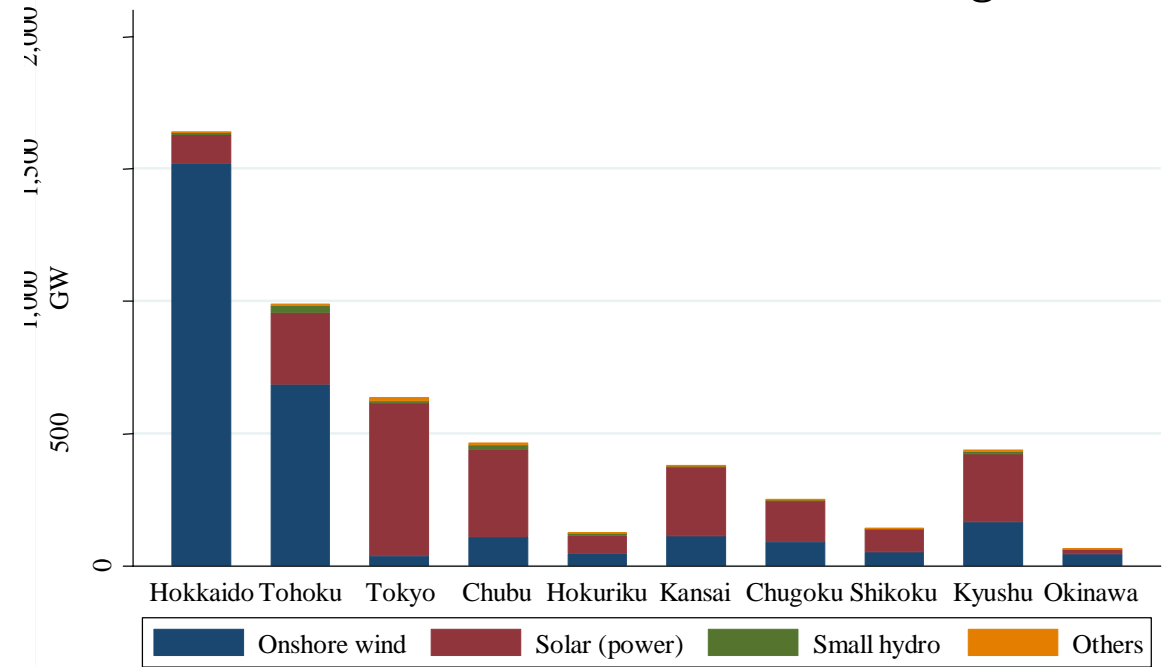
Fact ①: Locations of fossil-fuel power plants and renewable energy are different

Generation capacity of conventional power plants



出典：資源エネルギー庁（2018）電事業便覧などを基に筆者作成

Potential of renewable energies

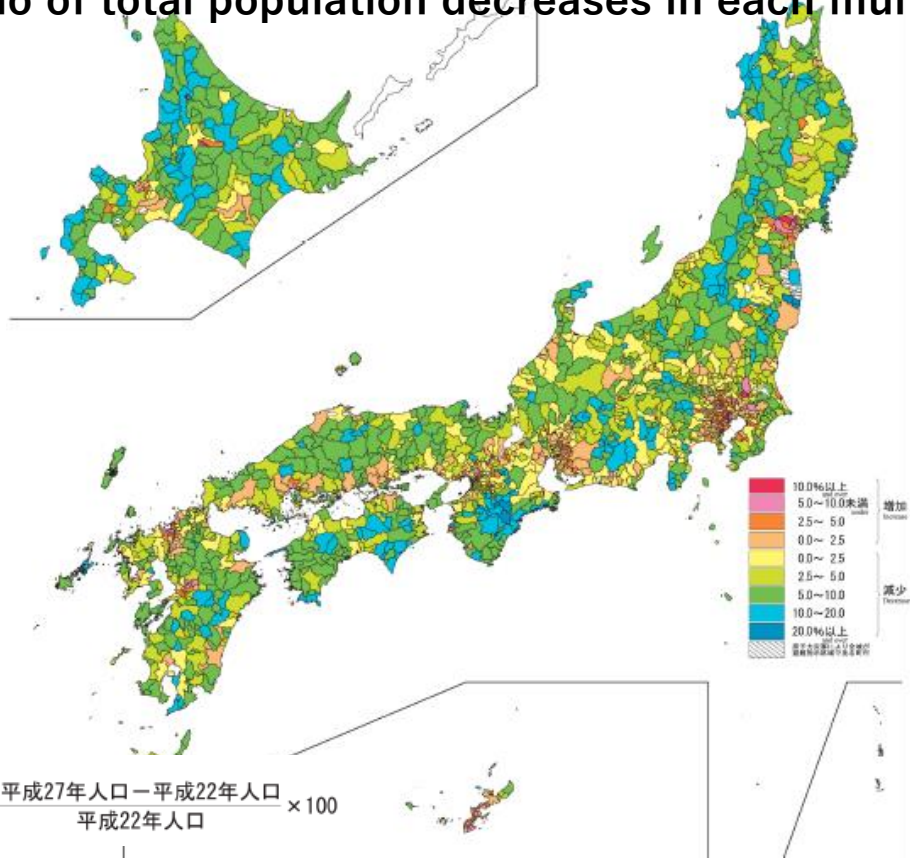


出典：環境省(2017)再生可能エネルギー導入ポテンシャルマップ・ゾーニング基礎情報を基に筆者作成

The location of power plants would change owing to the decarbonization of the power sector

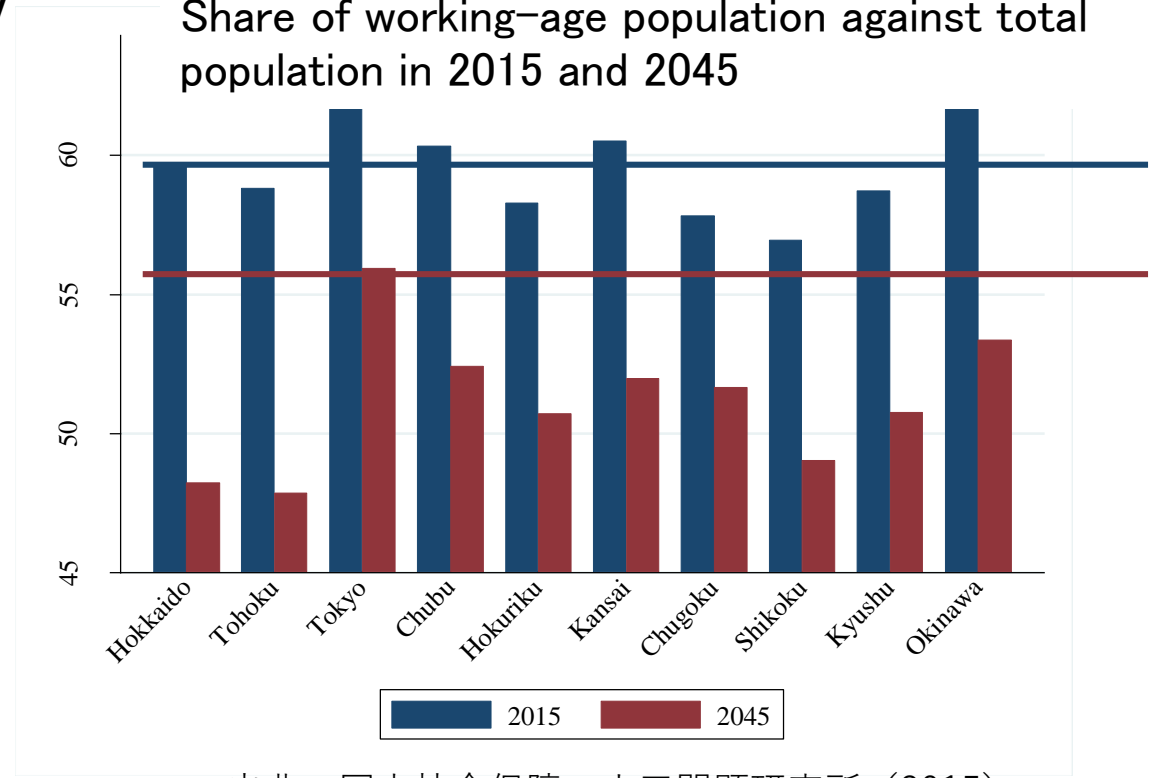
Fact ②: Population and working-age population decreases in rural areas

The ratio of total population decreases in each municipality



出典：総務省(2015)日本統計地図

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



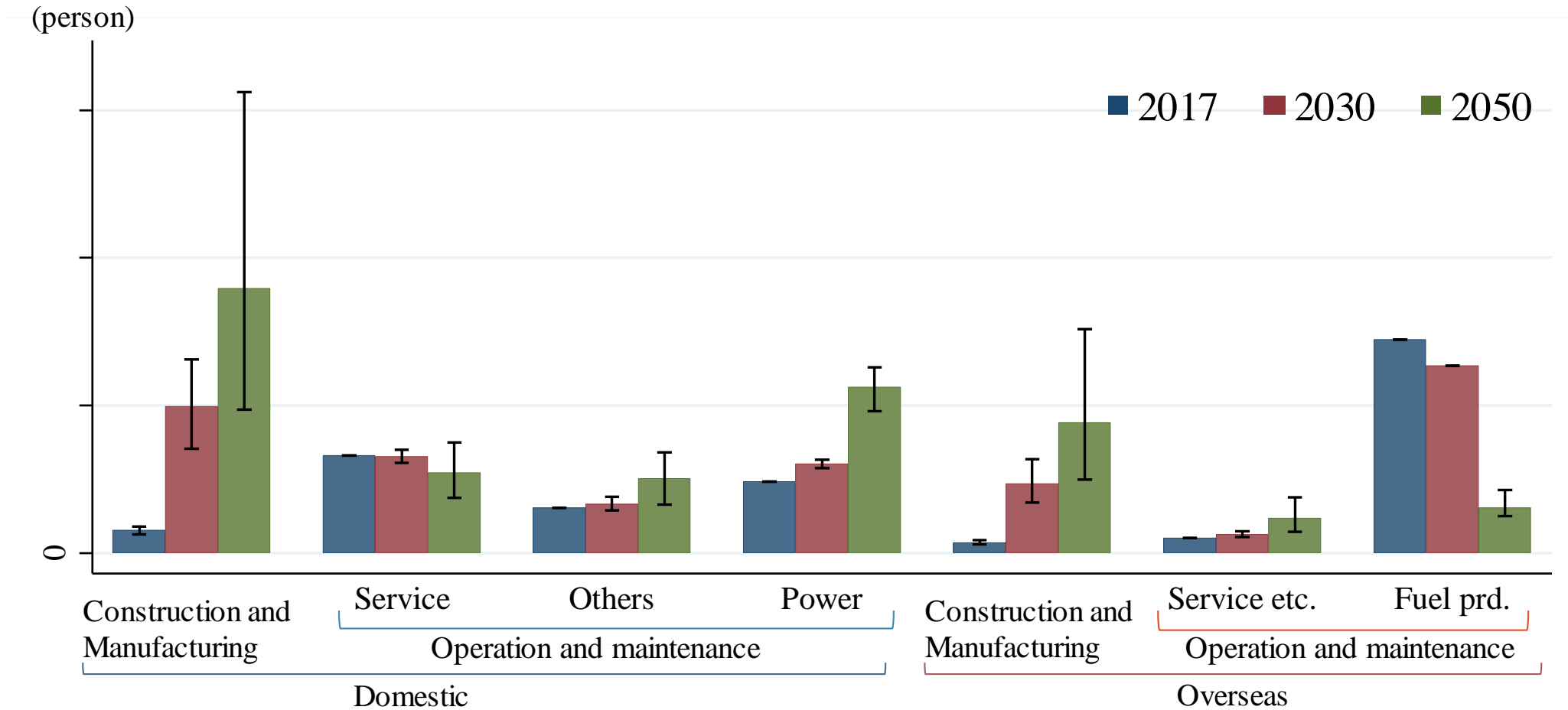
出典：国立社会保障・人口問題研究所 (2015)
日本の地域別将来推計人口を基に筆者作成

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

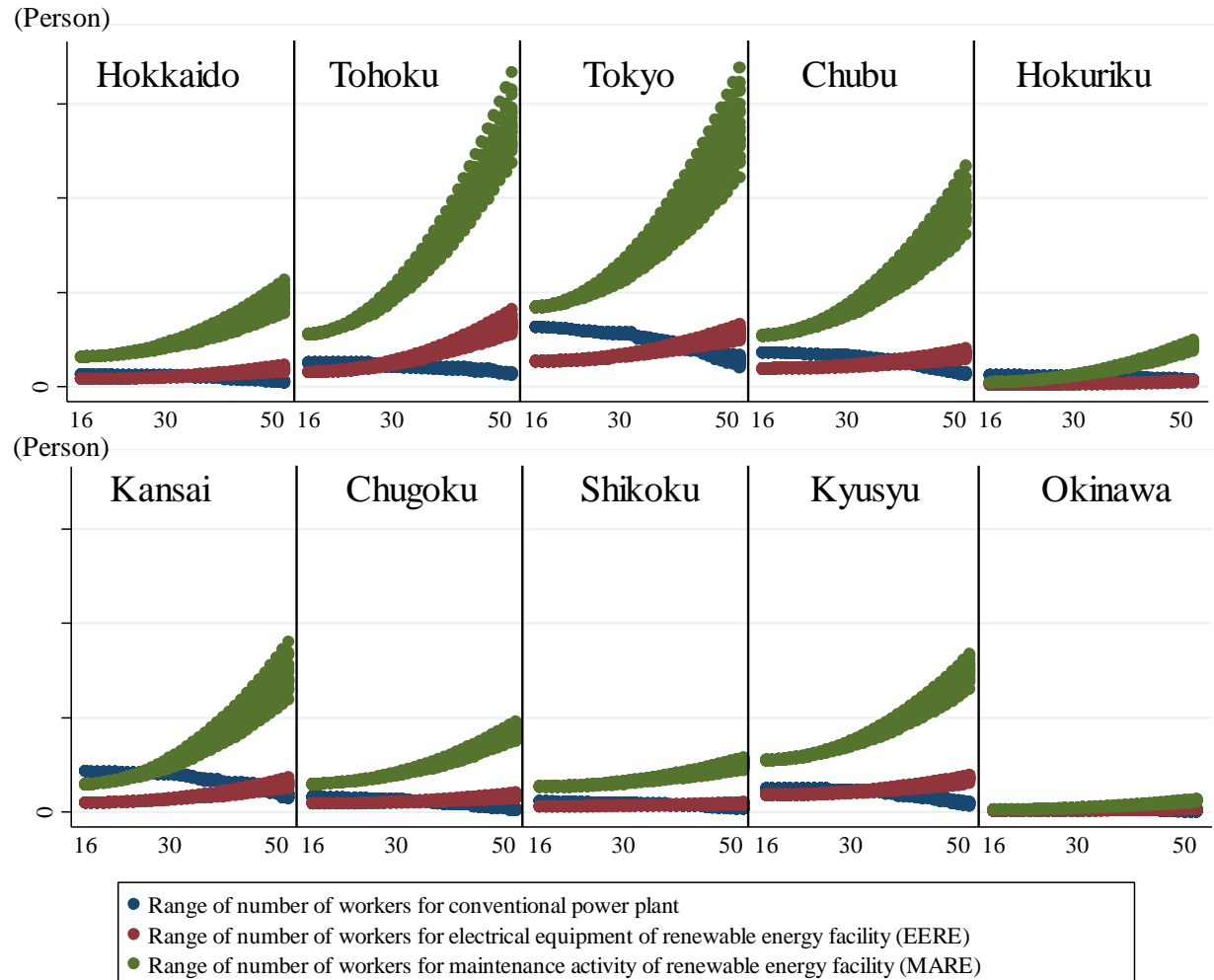
Research questions on analysis for a just transition towards decarbonisation of the power sector

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



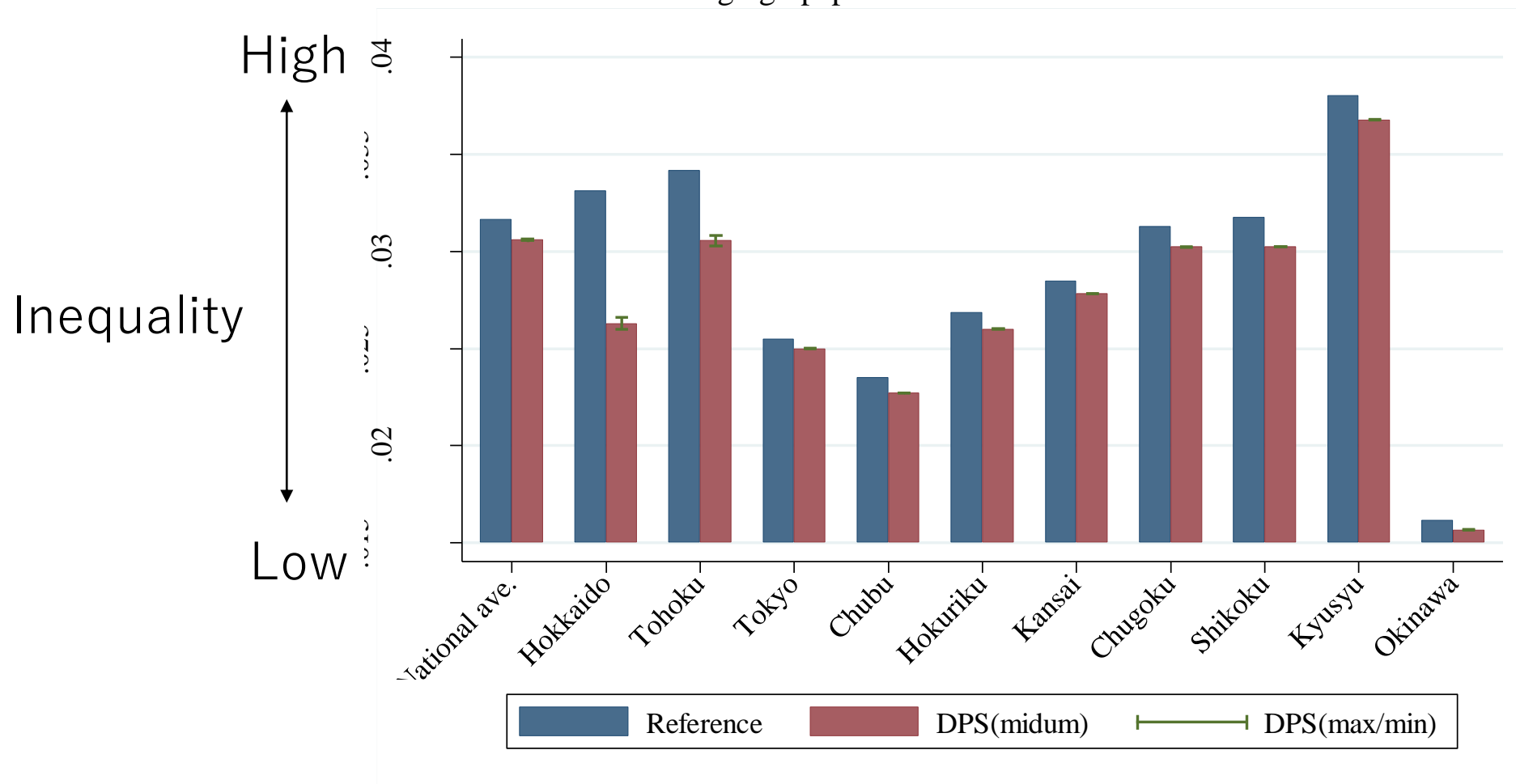
Policy implications:
It is necessary to secure labour force who can engage in maintenance work for renewable energy.

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

Gini coefficient of working-age population distribution



Is it possible to achieve a smooth transition to decarbonisation of the power sector?

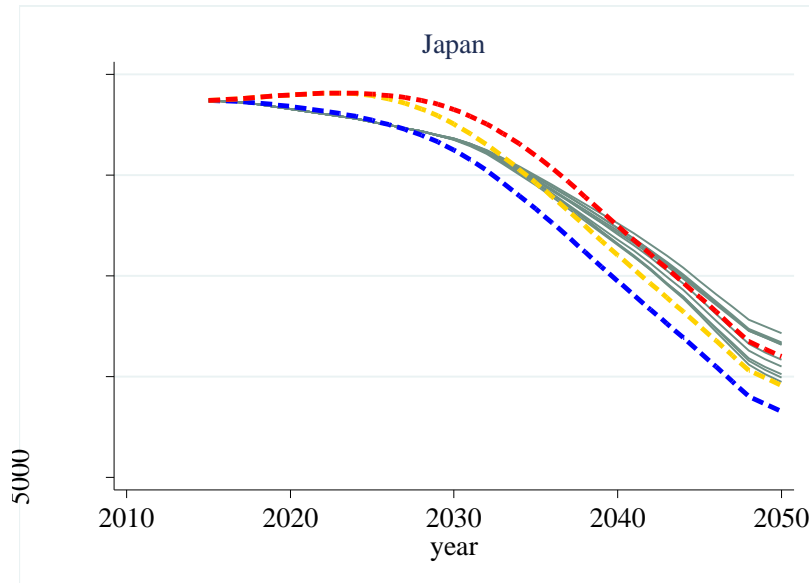
1. Which one of A and B decreases faster?

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

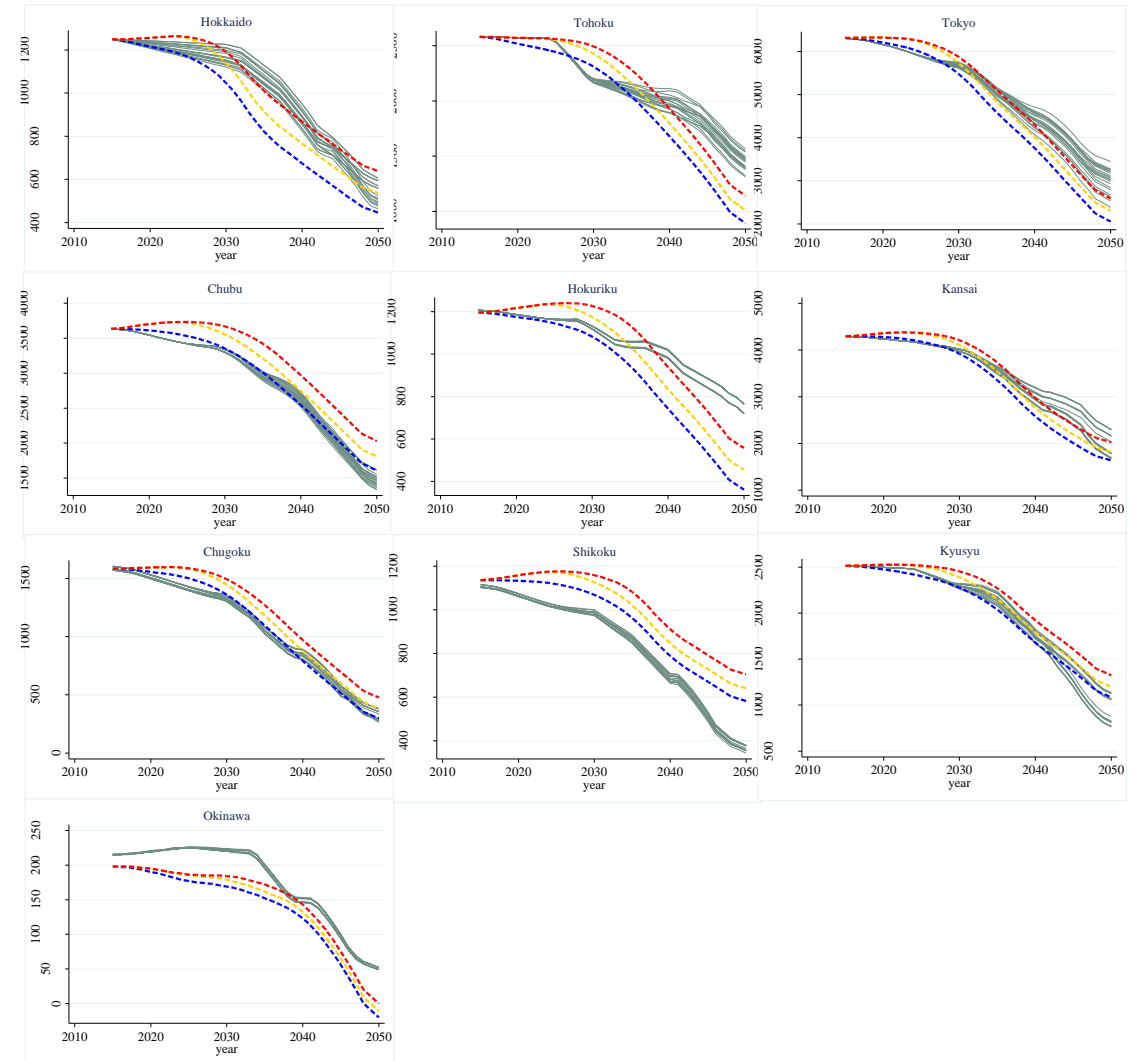
B: Decrease in engineers of conventional power generation in the decarbonization scenario

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.



- Range of the number of workers for conventional power plants in the DPS scenarios
- - - Number of workers for conventional power plants in natural reduction scenario after recruitment by 2035
- - - Number of workers for conventional power plants in natural reduction scenario after recruitment by 2025
- - - Number of workers for conventional power plants in natural reduction scenario without new recruitment

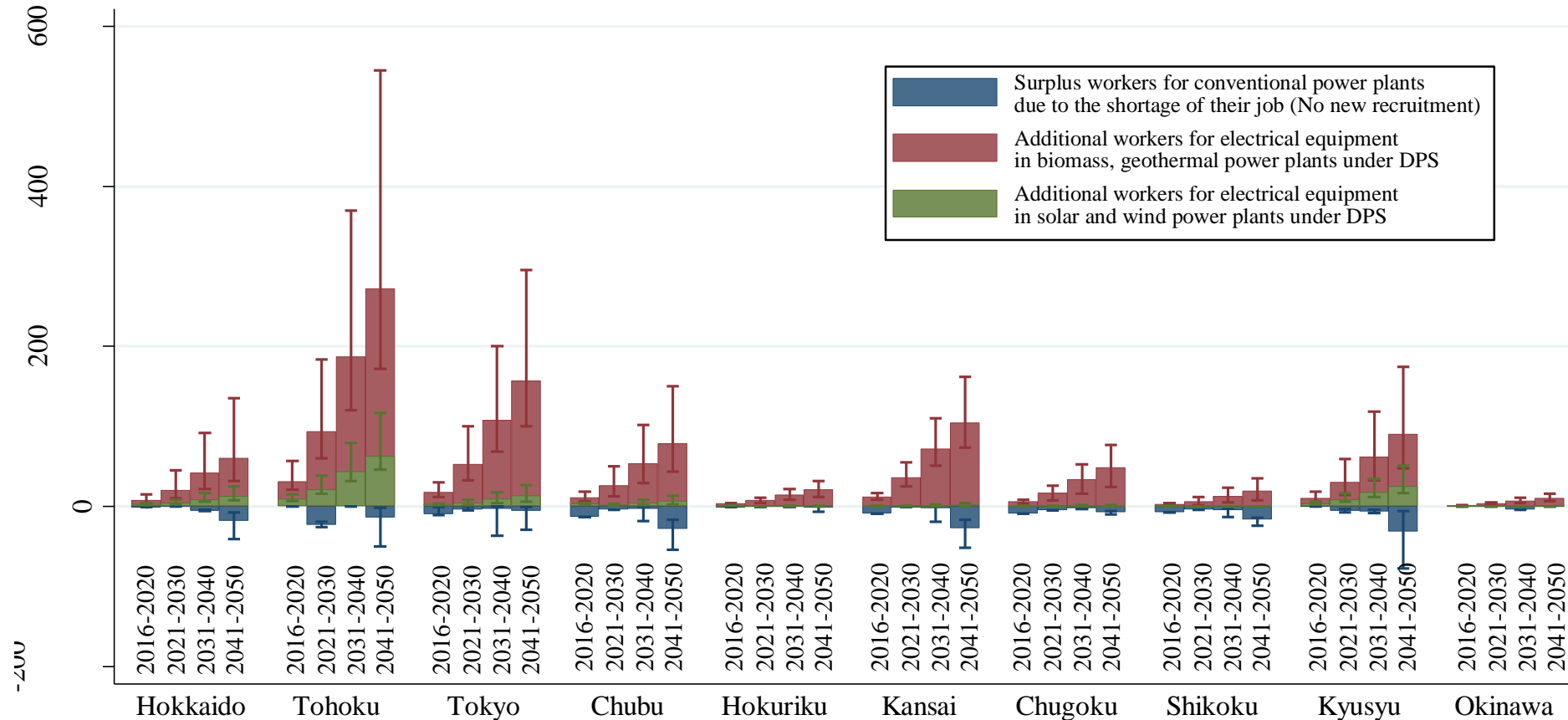


Surplus employers from conventional power plant has two options to find their new job.

- (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.