Importance of employment impact on local areas to expand renewable energy

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1. Background and importance of employment issues for the rural areas in Japan

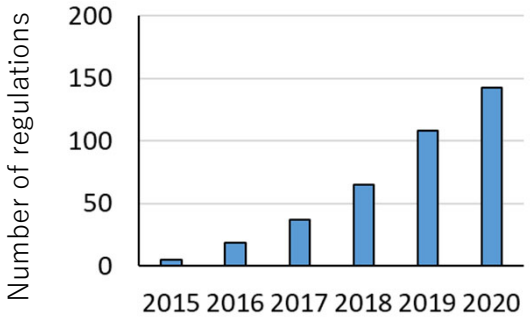
Background of research

In the 6th Strategic Energy Plan (October 2021), renewable energy is defined as the major power source **on the top priority**.

It seems that renewable energy market is promising, but some issues.

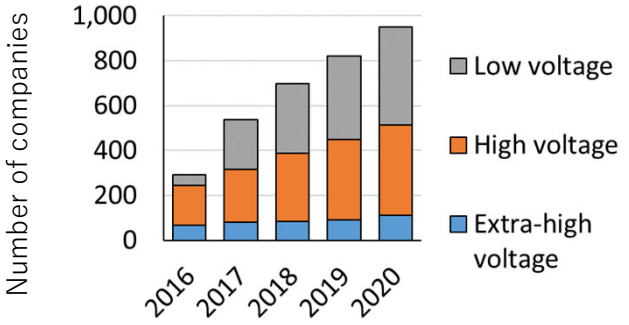
- **Local residents' oppose** to a large scale solar power plants and wind farms due to nature conservation, disaster risk, landscape, etc.
- Increasing number of electric retailers. They needs to have **new value added rather than just to sell electricity from renewable energy**.

Number of regulations against large-scale solar power plant by municipalities



Source: Authors based on Takeuchi (2021) http://www.econ.kyoto-u.ac.jp/renewable_energy/stage2/contents/column0254.html

Number of electric retail companies by year



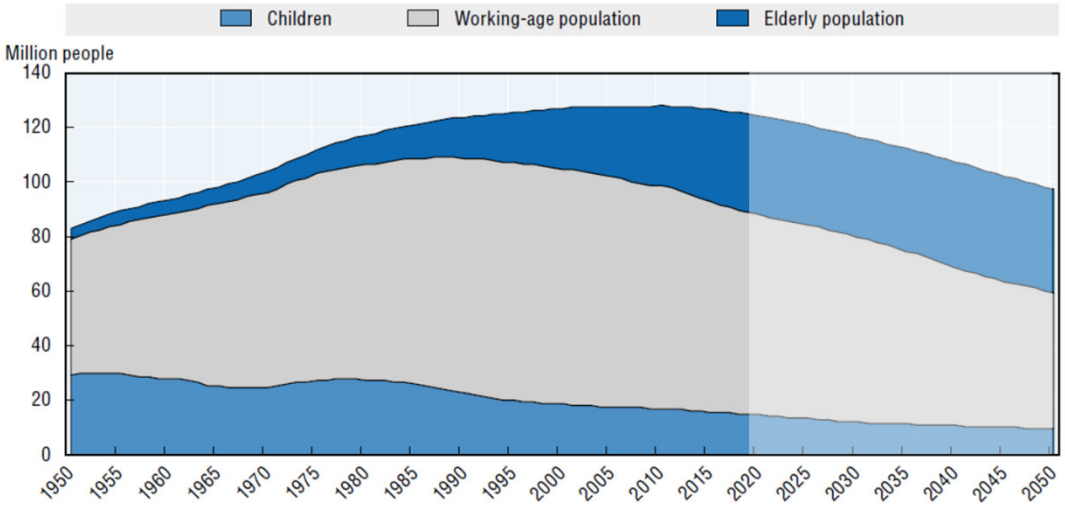
Source: Authors based on METI (2021) https://www.meti.go.jp/shingikai/enecho/denryoku_gas/denryoku_gas/pdf/034_03_00.pdf

It could be important to show a story where **renewable energy have benefits for "local areas"**

This study **focus on employment** of renewable energy as a co-benefit.

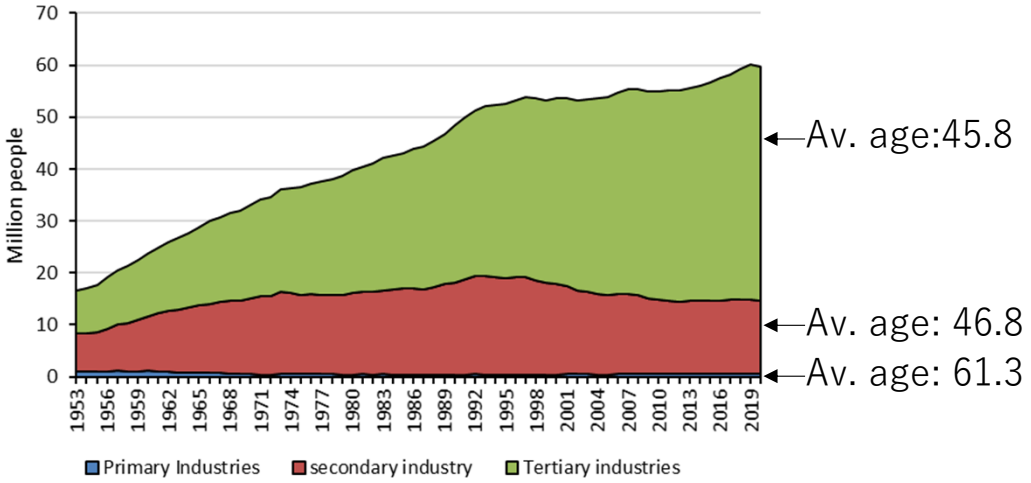
Japan goes to the rapid ageing society

Japanese population and age structure, 1950-2050



Source: OECD (2016), OECD Territorial Reviews: Japan 2016, OECD Publishing, Paris.

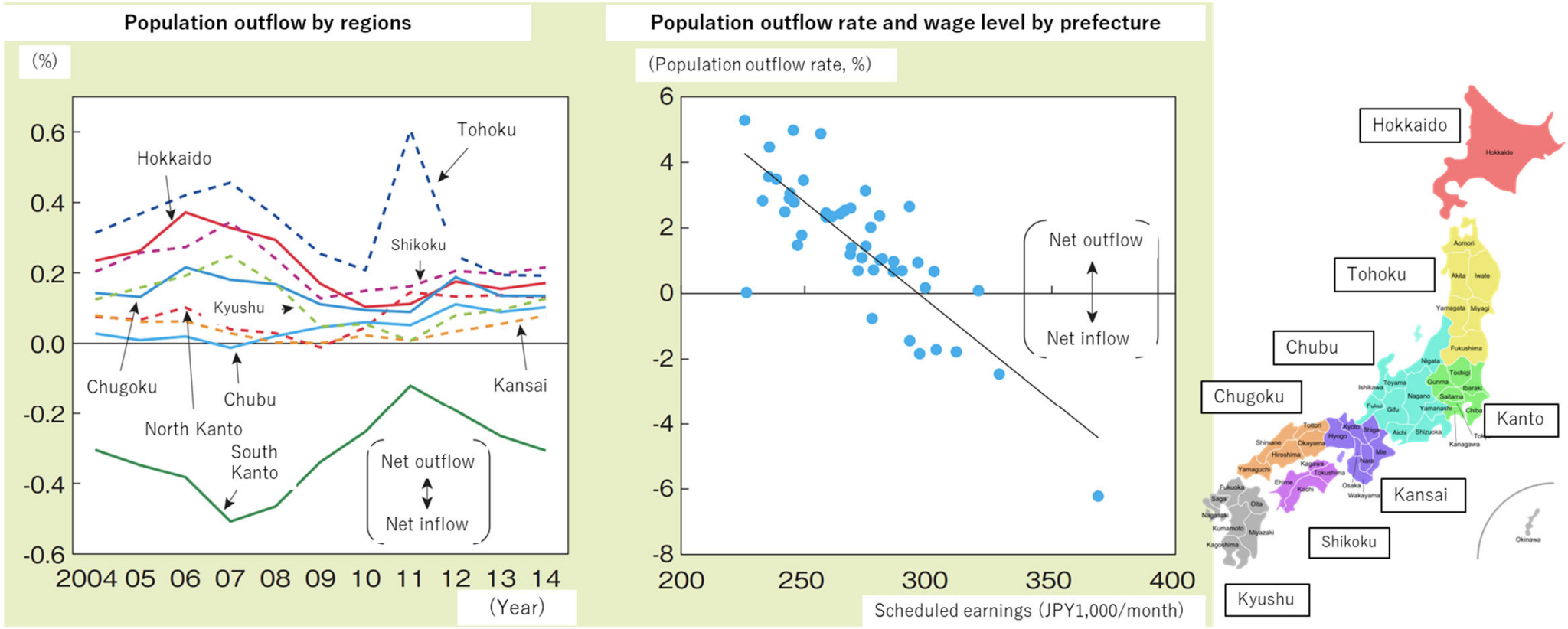
Number of employees by sector, 1950-2020



Source: The Japan Institute for Labour Policy and Training
https://www.jil.go.jp/kokunai/statistics/timeseries/html/g0205.html

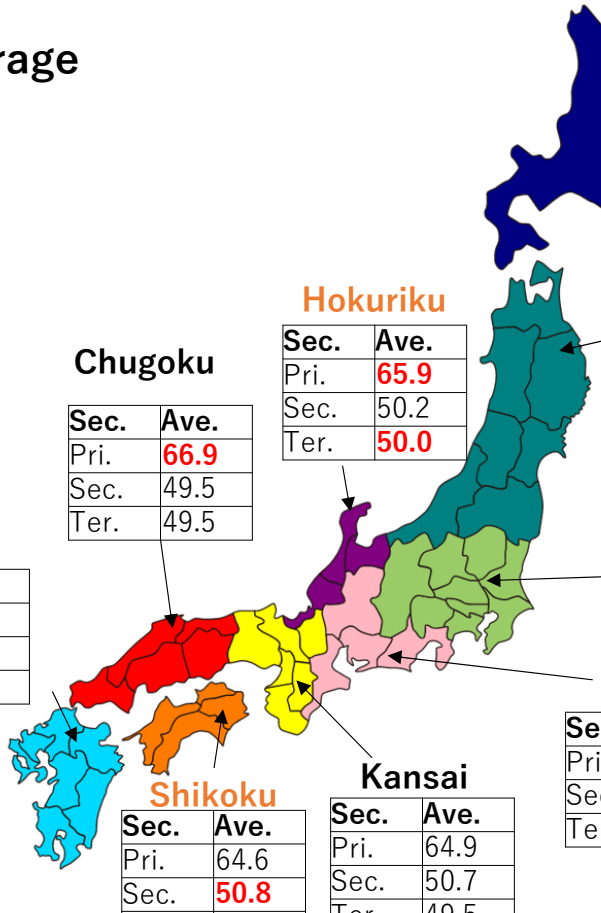
People goes to the south Kanto (Tokyo) from the rural areas

Large wage inequality has contributed to continuous population outflow from local areas



(Source: Cabinet Office. (2015). Annual Report on the Japanese Economy and Public Finance 2015 (in Japanese). https://www5.cao.go.jp/j-j/wp/wp-je15/pdf/p02023_1.pdf)

If the current social and economic structure continues till 2045, working age populations in the rural areas (Hokkaido, Tohoku, Hokuriku and Shikoku) would be more aged than urban area



National Average

Sec.	Ave.
Pri.	64.1
Sec.	50.2
Ter.	49.5

Hokkaido

Sec.	Ave.
Pri.	57.5
Sec.	**52.1**
Ter.	**50.8**

Tohoku

Sec.	Ave.
Pri.	**65.4**
Sec.	**51.8**
Ter.	**51.5**

Hokuriku

Sec.	Ave.
Pri.	**65.9**
Sec.	50.2
Ter.	**50.0**

Chugoku

Sec.	Ave.
Pri.	**66.9**
Sec.	49.5
Ter.	49.5

Kanto

Sec.	Ave.
Pri.	64.5
Sec.	50.2
Ter.	48.9

Kyusyu

Sec.	Ave.
Pri.	62.3
Sec.	50.1
Ter.	49.7

Chubu

Sec.	Ave.
Pri.	65.6
Sec.	49.4
Ter.	48.9

Okinawa

Sec.	Ave.
Pri.	60.6
Sec.	50.4
Ter.	48.5

Shikoku

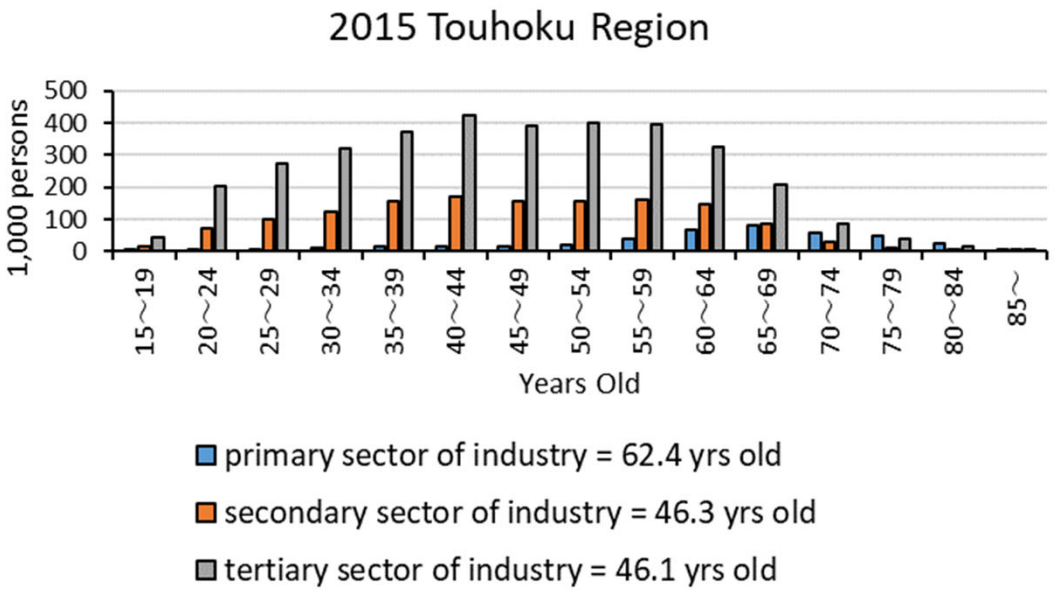
Sec.	Ave.
Pri.	64.6
Sec.	**50.8**
Ter.	**50.8**

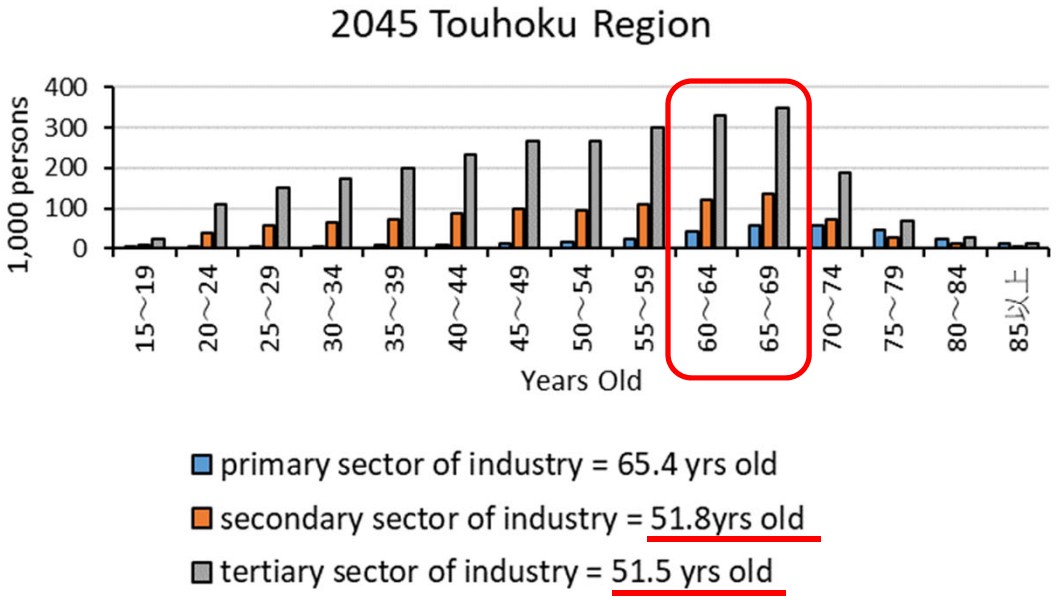
Kansai

Sec.	Ave.
Pri.	64.9
Sec.	50.7
Ter.	49.5

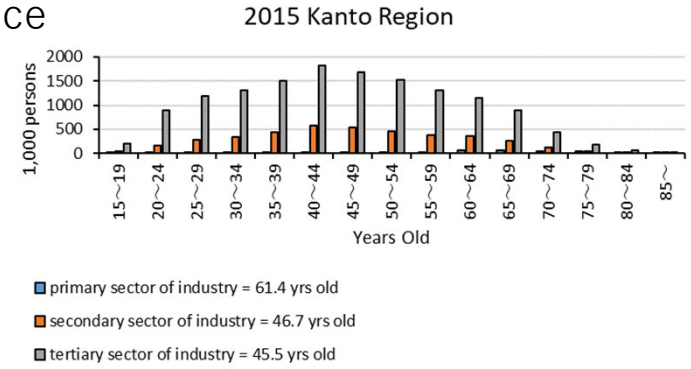
Source: Calculated by authors based on IPSS (2018) Regional Population Projections for Japan: 2015–2045

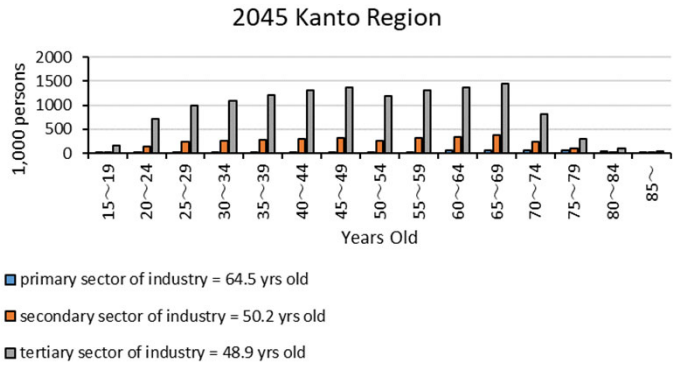
In Tohoku area, majority of employees are the person of 65-69 years old in 2045.





reference

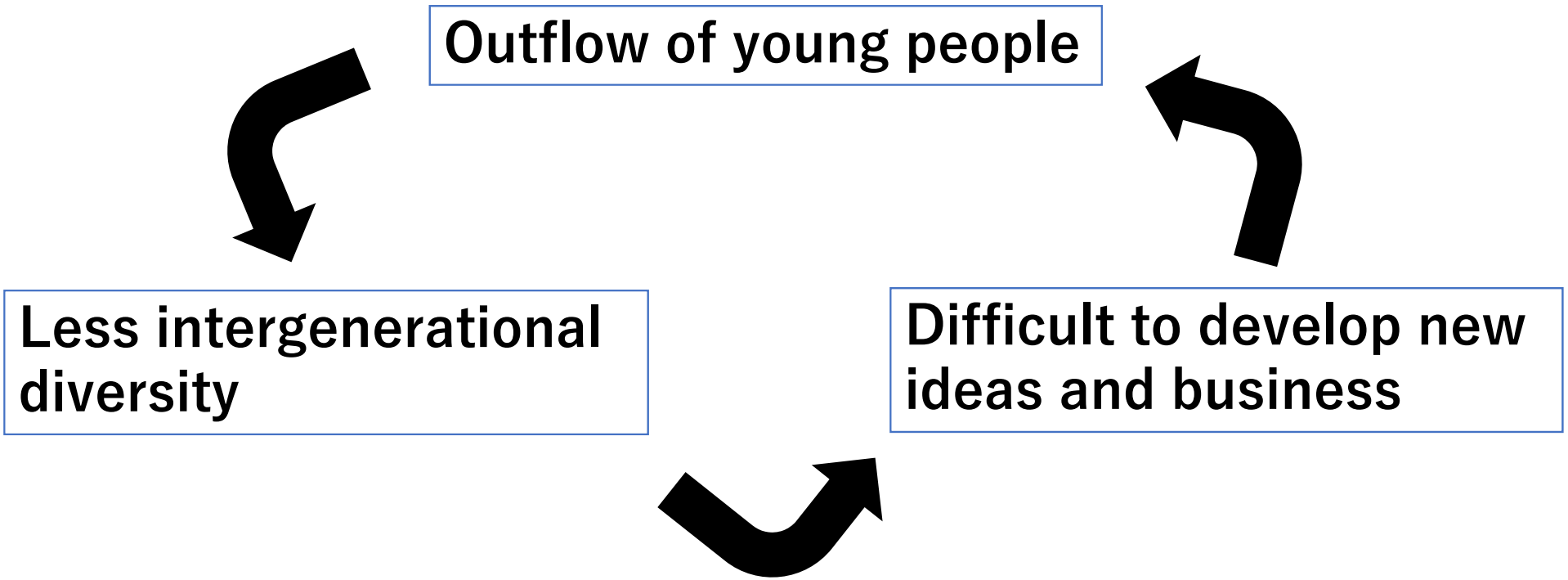




Source: Calculated by authors based on IPSS (2018) Regional Population Projections for Japan: 2015–2045

Concern: “Shrinking spiral” caused by an super-aged society would happen

Current projection of future society is not sustainable

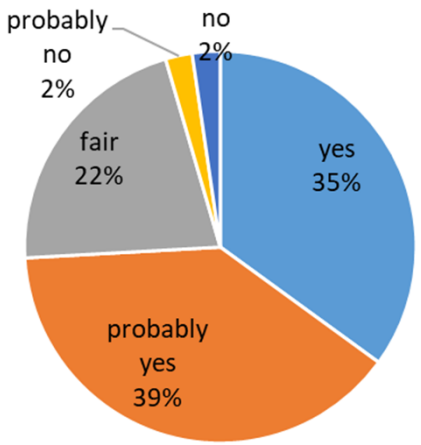


References: Authors based on the Cabinet Office.
https://www5.cao.go.jp/keizai-shimon/kaigi/special/future/sentaku/s2_3.html

How to attract young people?

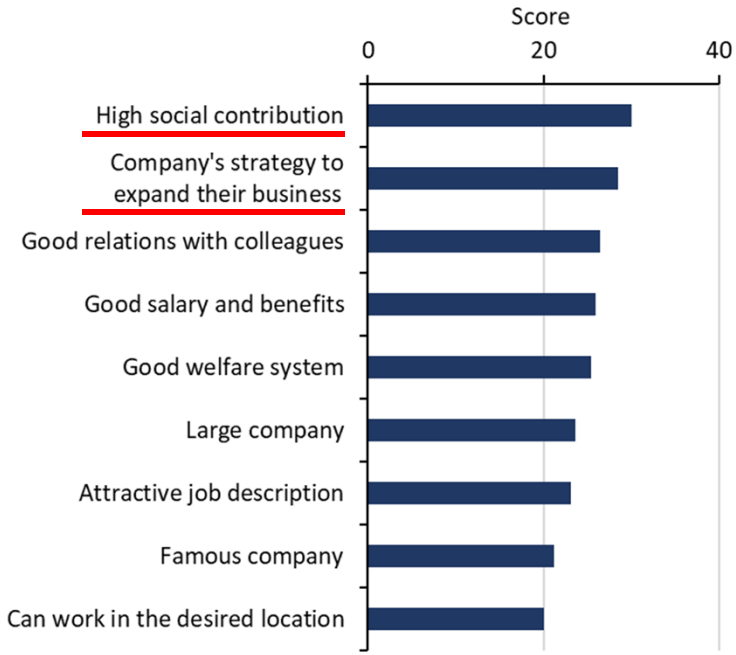
- SDGs and sustainable growth strategy of companies attracts young people!
- Renewable energy would be basis for such business activities

If you notice that a company works on SDGs, are you motivated to work for the company?



Source: Gakujo Co., Ltd (2021)
https://ferret-one.akamaized.net/files/610b54f3ad7b89319ef350ef/210806-navienq.pdf?utime=1628132595

Reasons for applying a company

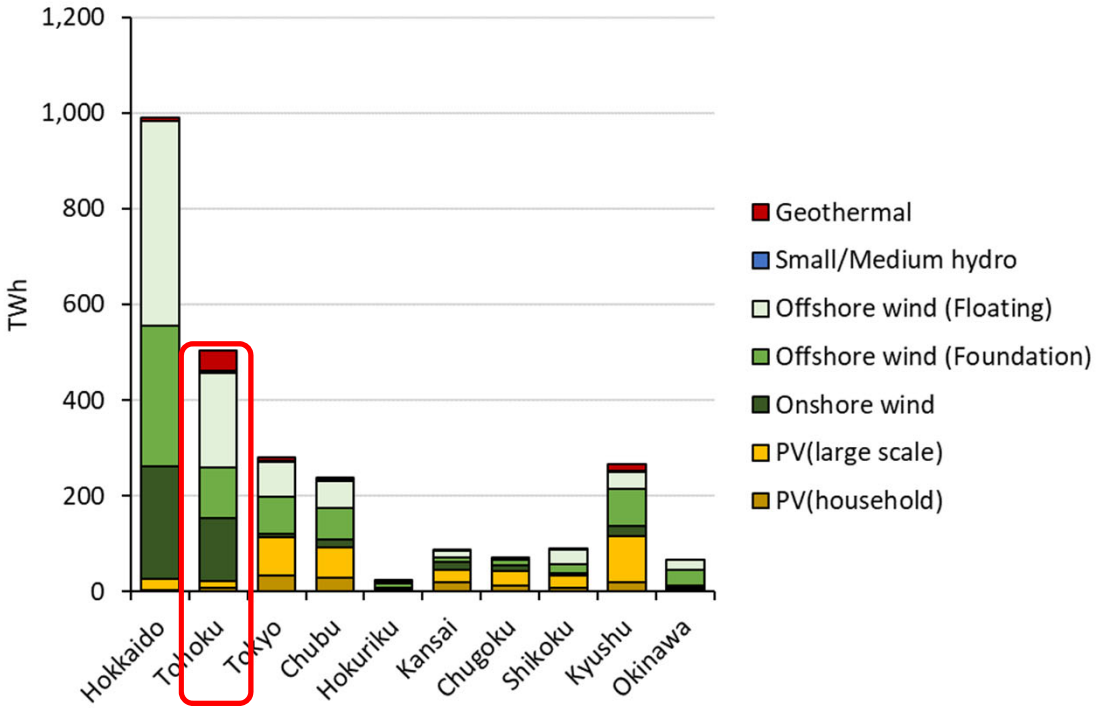


Source: DISCO Inc. (2020)
https://www.disc.co.jp/wp/wp-content/uploads/2020/09/sdgsshu_202008.pdf

Situation of Tohoku Area

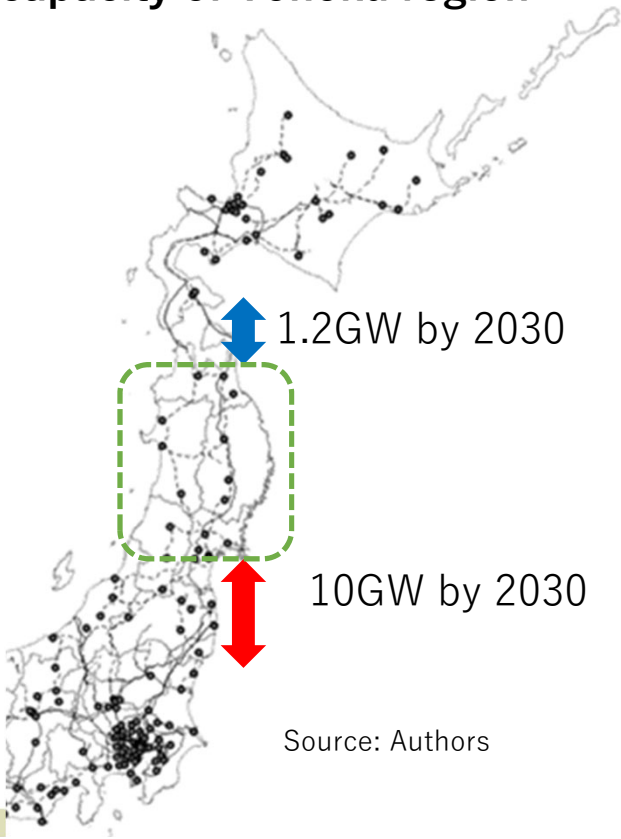
- Tohoku Area has the second largest renewable energy potential
- Tohoku Area is close to the largest electricity demand area, Tokyo.
- A large capacity of transmission lines between Tohoku and Tokyo

Potential of renewable energy in Japan



Source: Calculated by authors based on MOEJ (2020)

Location and cross-regional transmission line capacity of Tohoku region



Source: Authors

2. Analysis for employment impact of renewable energy on the rural areas

Research questions and overview of methodology

Research questions

1. How much renewable energy improve **average age of working age** population in rural area?
2. How much renewable energy improve **uneven distribution of working age population** at a municipality level in the **rural areas?**

Source: Kuriyama, A., & Abe, N. (2021). Decarbonisation of the power sector to engender a 'Just transition' in Japan: Quantifying local employment impacts.

Overview of methodology

1. Calculate reference scenarios of working-age populations in the regions

↓

2. Identify scenarios of installation capacity of renewable energy under a decarbonized society by regions.

↓

3. Calculate numbers of employees created by renewable energies **using employment factors** of renewable energy

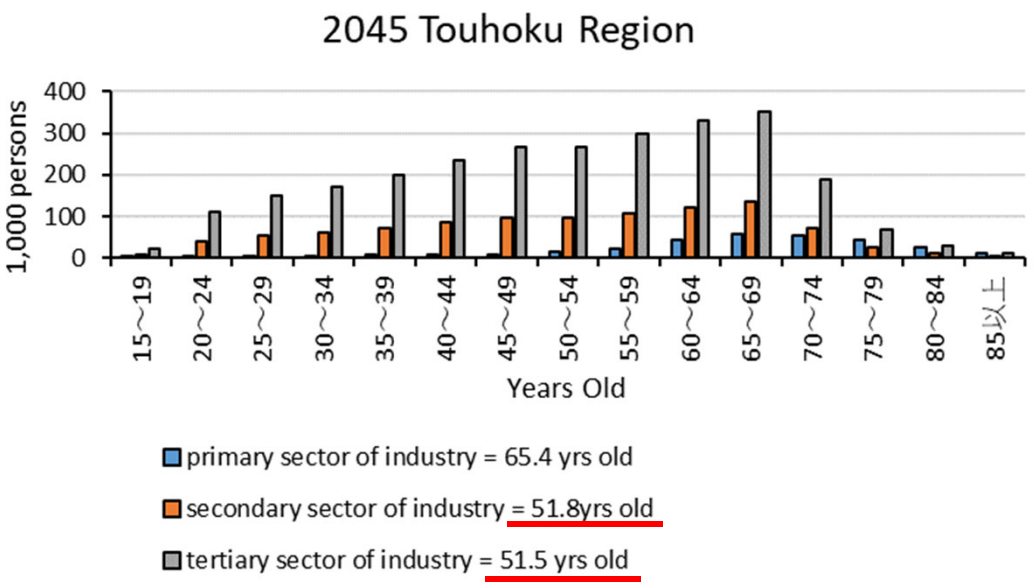
↓

4. Calculate average age of working-age population and Gini coefficient as a indicator of uneven distribution of working age population

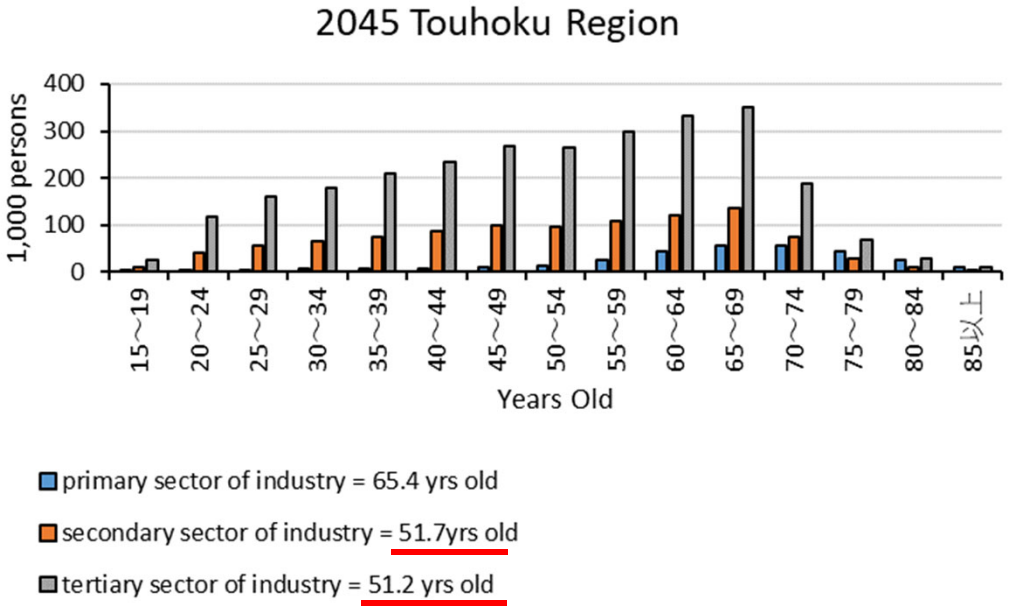
Result1: High renewable energy scenario would improve average age of working-age population in the Tohoku region at 0.1 point.

Reference scenario based on current projection by IPSS

(IPSS: National Institute of Population and Social Security Research)

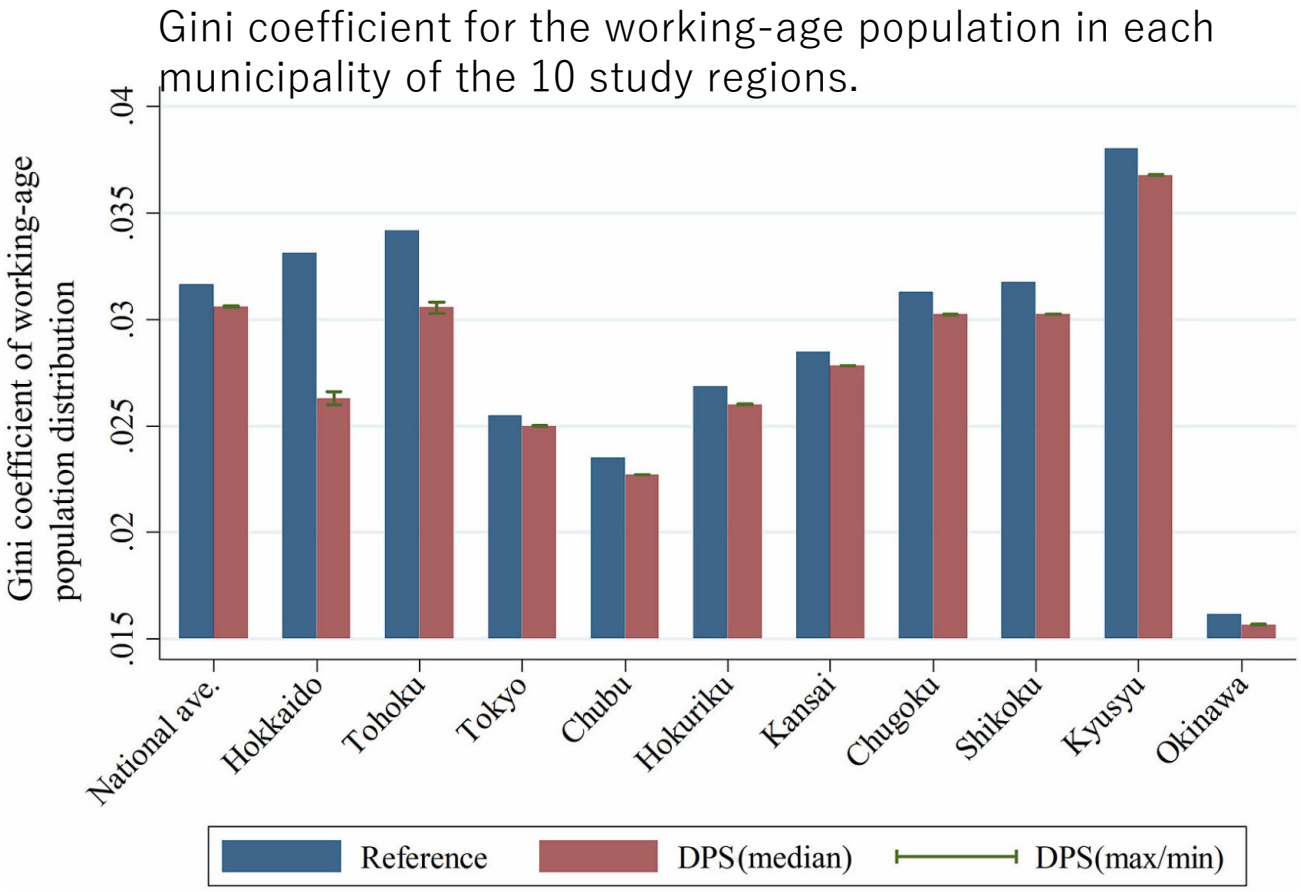


High renewable energy scenario



Source: Calculated by authors

Result2:
It would improves working-age population distribution within Tohoku region



Source: Kuriyama, A., & Abe, N. (2021). Decarbonisation of the power sector to engender a 'Just transition' in Japan: Quantifying local employment impacts.

3. Summary and way forward:

- This study focuses on **the employment impacts of renewable energy**, which could be an important factor in expanding renewable energy.
- Particularly in rural areas where the population is ageing, renewable energy could be a basis **of a long-term strategy to attract young people** in order to avoid a “shrinking spiral” and build a sustainable community.
- The result shows that renewable energy has the effect of **improving the uneven distribution of the working-age population** in the region.
- As future research, it is also important to analyze the employment impact for **the whole economy,** including decarbonization strategies for the **non-electric sectors (e.g. industries)** as well as issues in the local communities caused by **the ageing society**.