

Inclusive Low-Carbon Energy Transition in Japan

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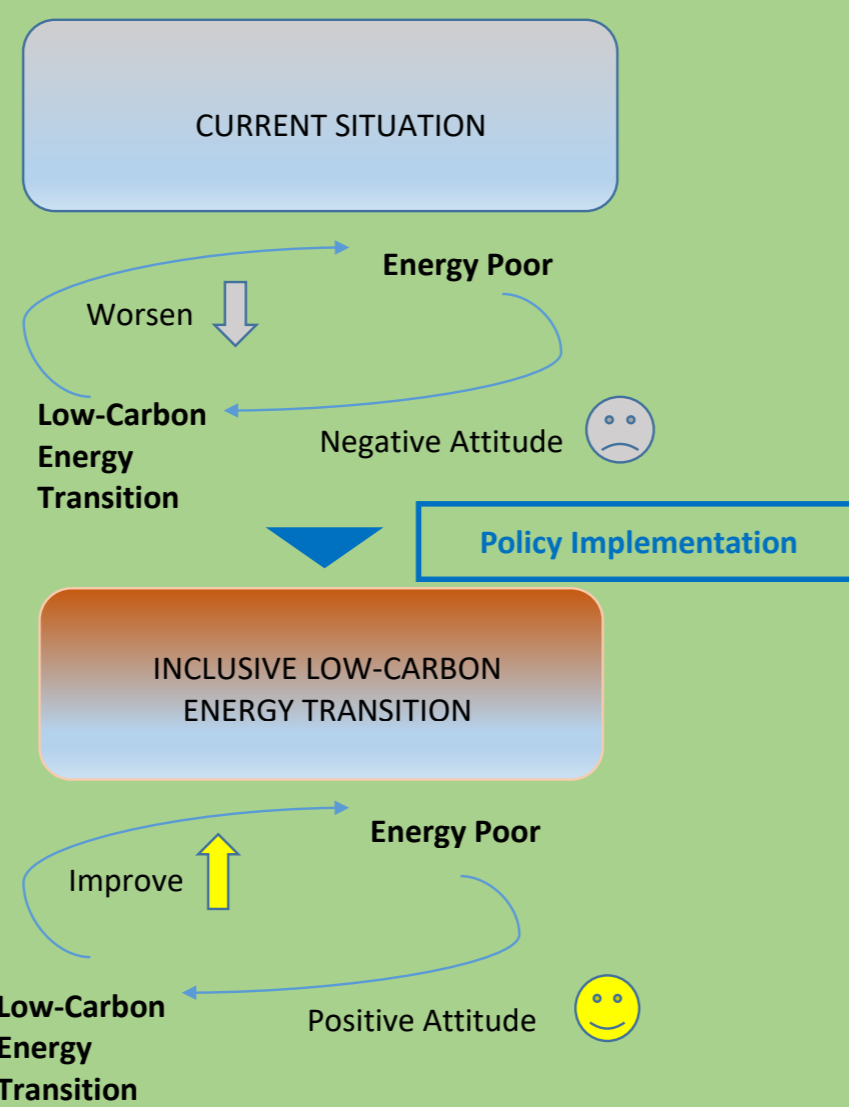


The issues we are tackling

In the post-Paris Agreement era, advancing low-carbon energy transition through deep carbon mitigation policy is an urgent issue in Japan. However, it generally exacerbates the problem of energy poverty. There exists a trade-off relationship between energy poverty and carbon mitigation.

Energy poverty: the inability to achieve a socially and materially necessitated level of domestic energy services.

Carbon mitigation policy makes low-quality (high-carbon-intensity) energy more expensive, which imposes more burdens on the energy poor than the affluent population.



The energy poor demonstrate a negative attitude and a lack of engagement to the current low-carbon energy transition regime in Japan (Chapman and Okushima, 2019).

How to ensure an inclusive or just low-carbon energy transition in Japan?

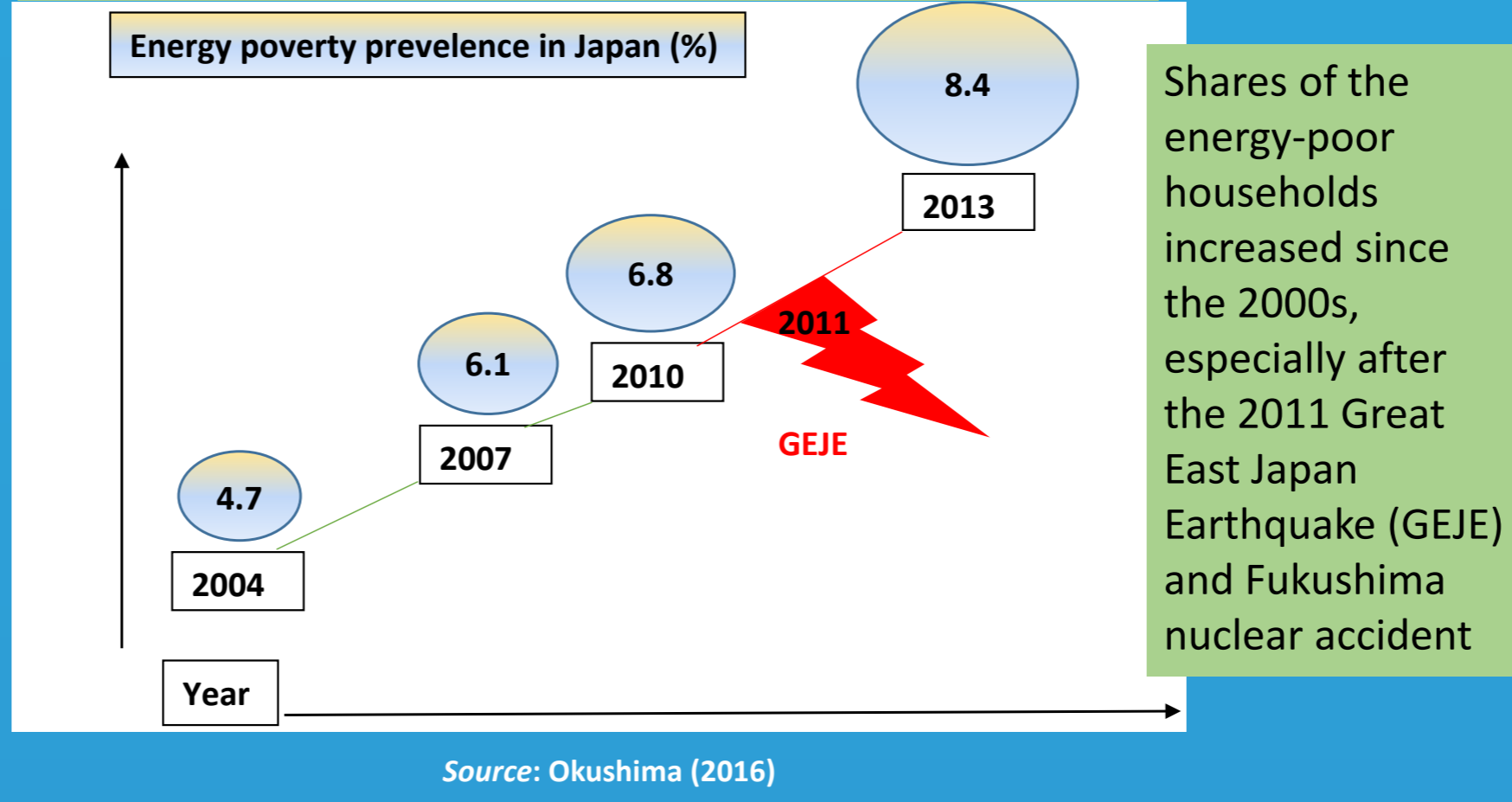
An inclusive low-carbon energy transition means the transition incorporating vulnerable and disadvantaged people (including low-income households, single-parent households, the elderly, disabled persons and the energy poor), and ensuring their engagement and participation of the transition process.

Works to be done

- Assessing the current situation on the energy poverty in Japan.
- Developing the methodologies for measuring the energy poverty phenomenon (for Japan and other developed countries).
- Evaluating the trade-off relationship between energy poverty and carbon mitigation.
- Considering how to realize fair and equitable benefit and burden sharing of deep decarbonization.

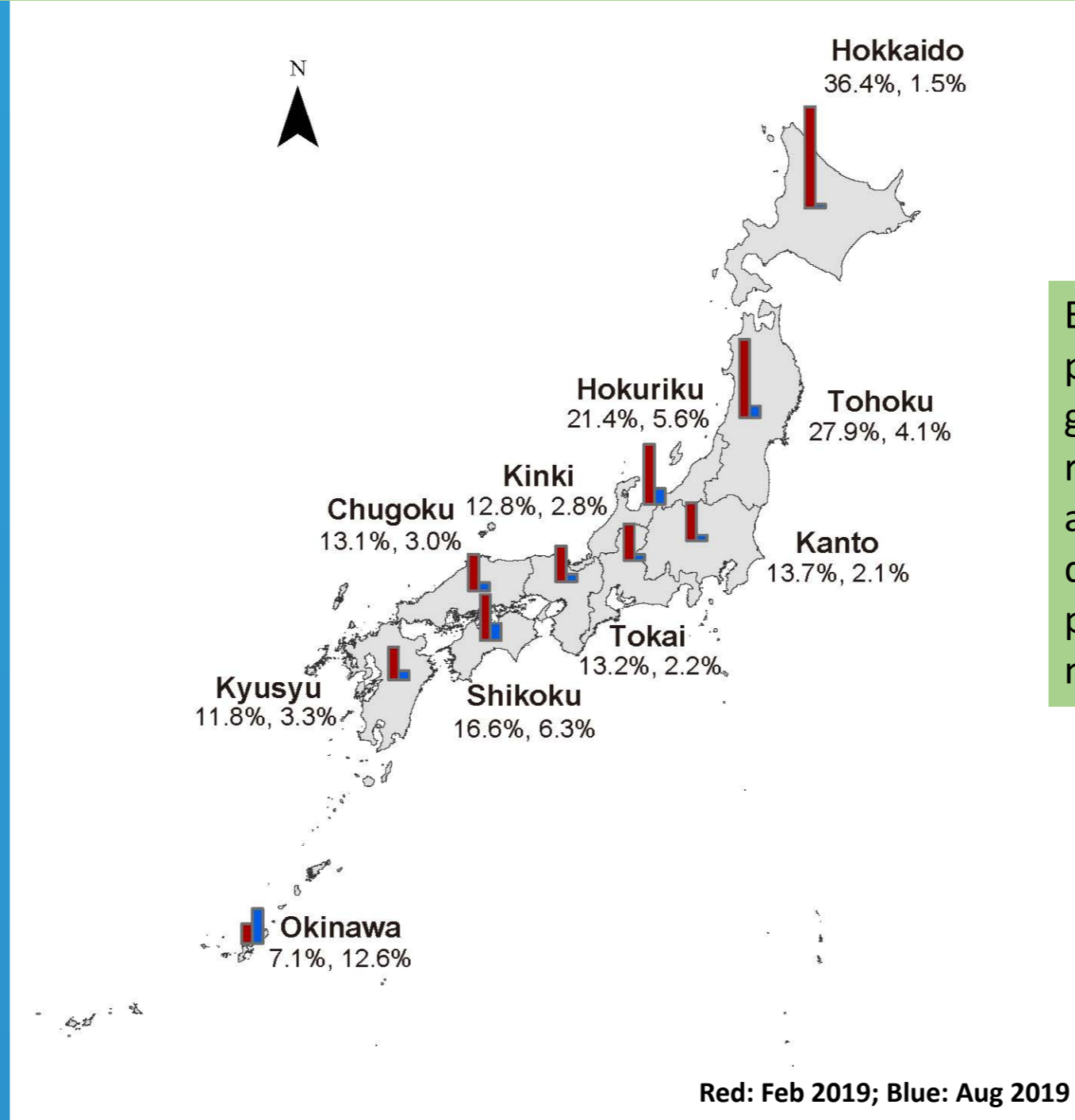
Current situation

Energy poverty prevalence in Japan from 2004 to 2013 (measured by the 10% measure)



Shares of the energy-poor households increased since the 2000s, especially after the 2011 Great East Japan Earthquake (GEJE) and Fukushima nuclear accident

Energy poverty prevalence in Japan (2019, measured by the 10% measure)

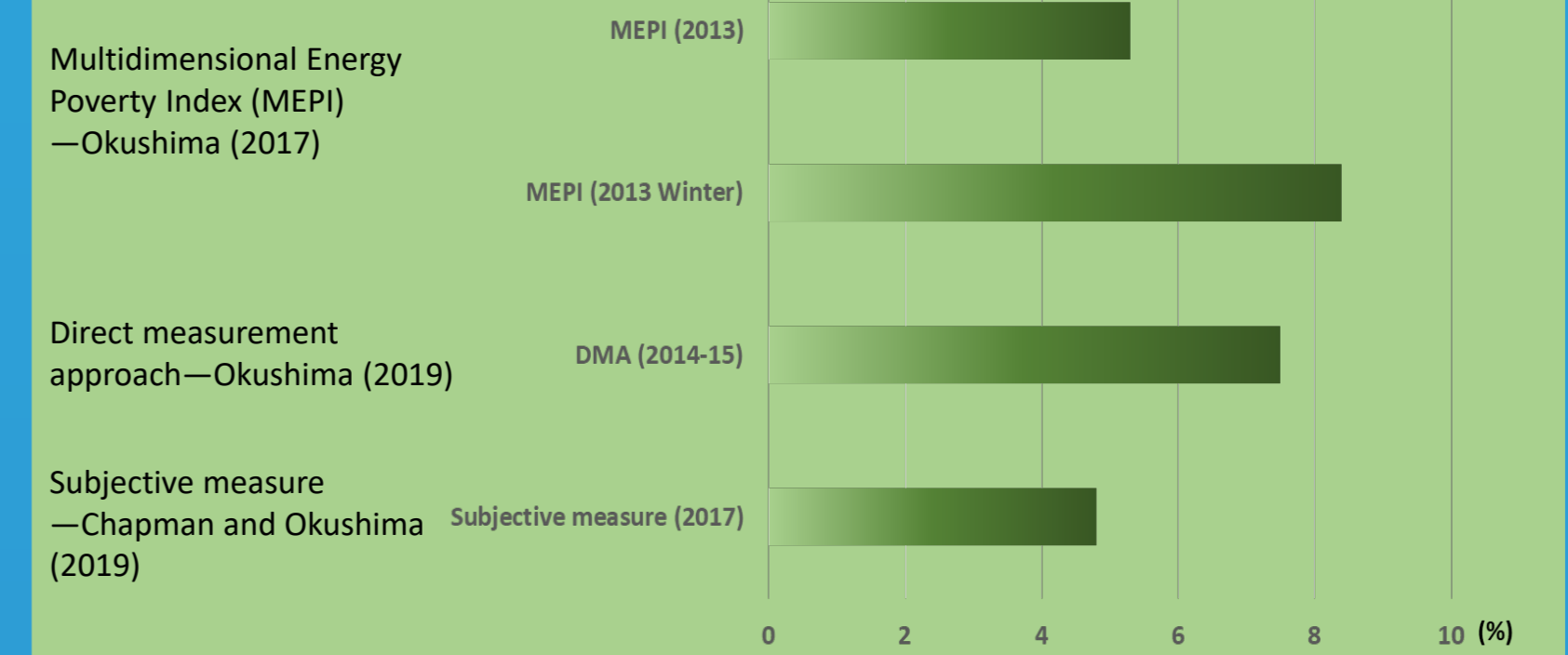


Energy poverty prevalence differs greatly between regions & seasons according to the difference in people's energy needs



Developing new methodologies

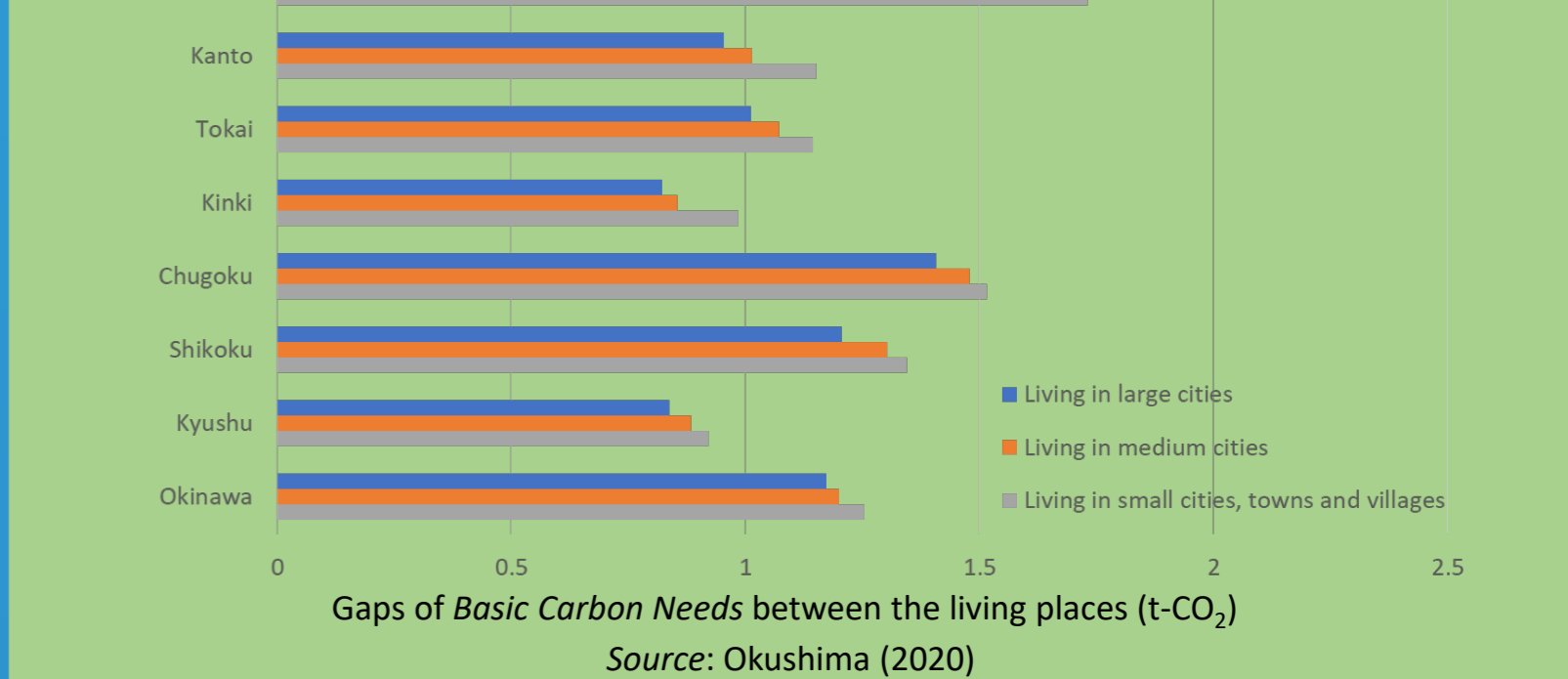
Until now, we have contributed to the development of several types of new methodologies



Basic Carbon Needs — A new concept

People's Basic Carbon Needs (BCN) — the amount of carbon emissions required to satisfy their Basic Energy Needs (BEN) — vary greatly, depending on the climate and energy infrastructure where they live. The gaps of BCN should be considered if (higher) carbon pricing or personal carbon trading (PCT) is introduced.

→ Also related to the issue of distributive justice of carbon emissions, that has been debated in the field of climate ethics or climate justice (Caney, 2011; Shue, 2014).



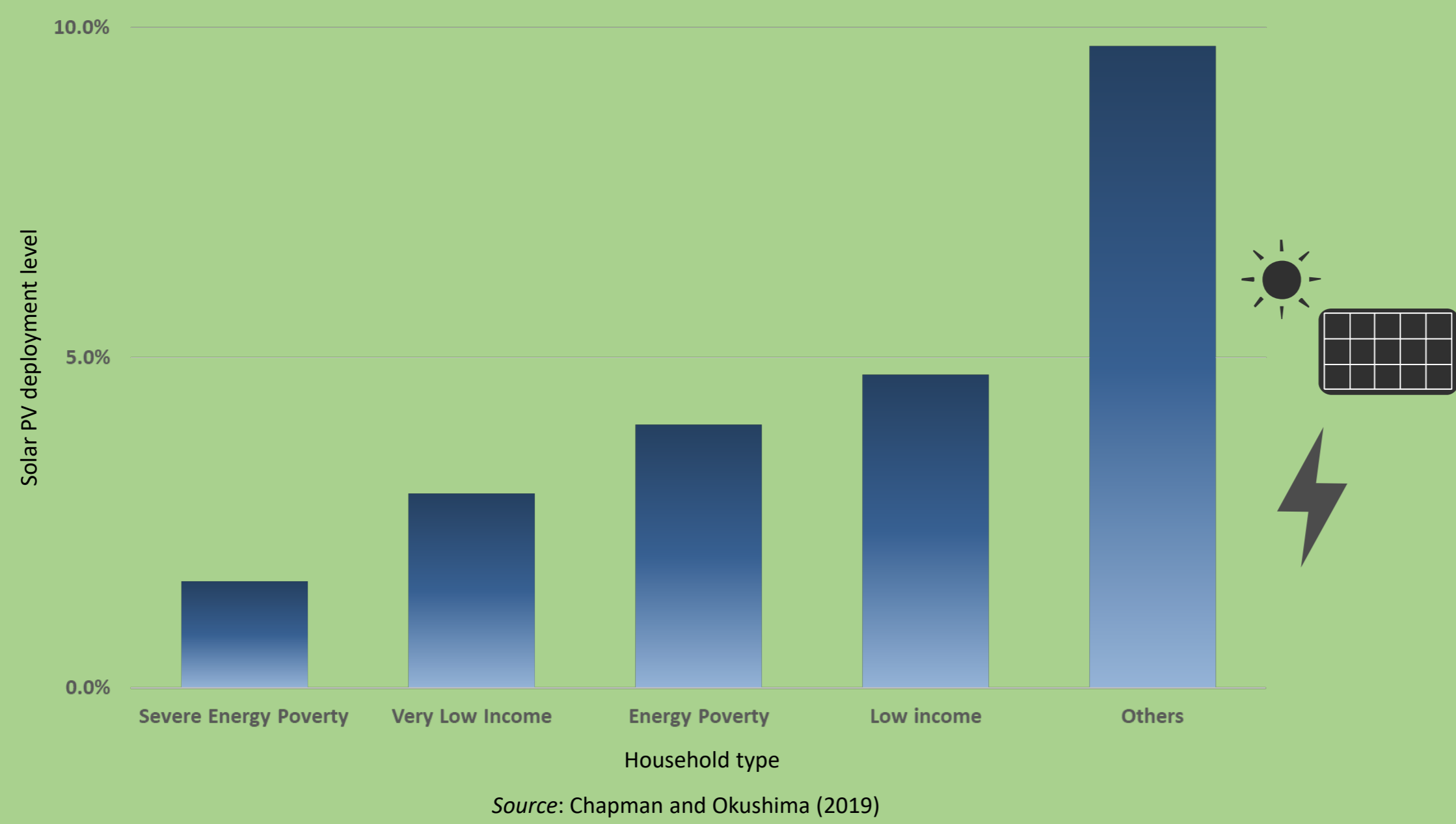
The works on the development of new methodologies are ongoing with several international collaborators



Key challenges for engendering an inclusive low-carbon energy transition in Japan

Unfair distribution of the benefits and costs of solar energy policy

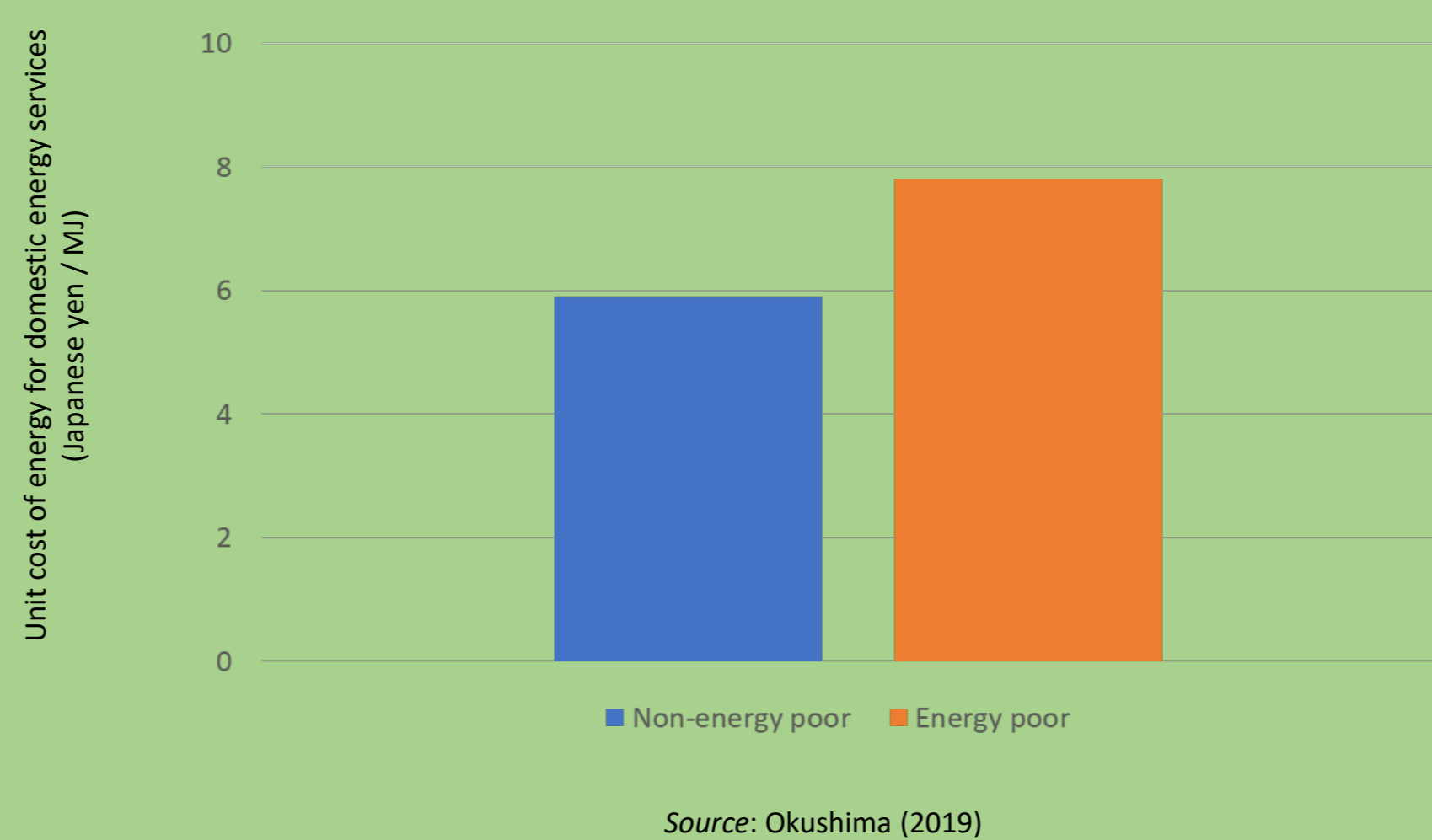
- Access to solar energy (solar PV deployment) is limited for vulnerable or disadvantaged people including low-income households and the energy poor.
- They can reap the smallest benefit of the FIT (Feed-in tariff) system, nevertheless, paying the cost of FIT (2.98JPY / kWh, 2019) with no exemption.



Source: Chapman and Okushima (2019)

Energy poverty premium (EPP): present disadvantage for the energy poor

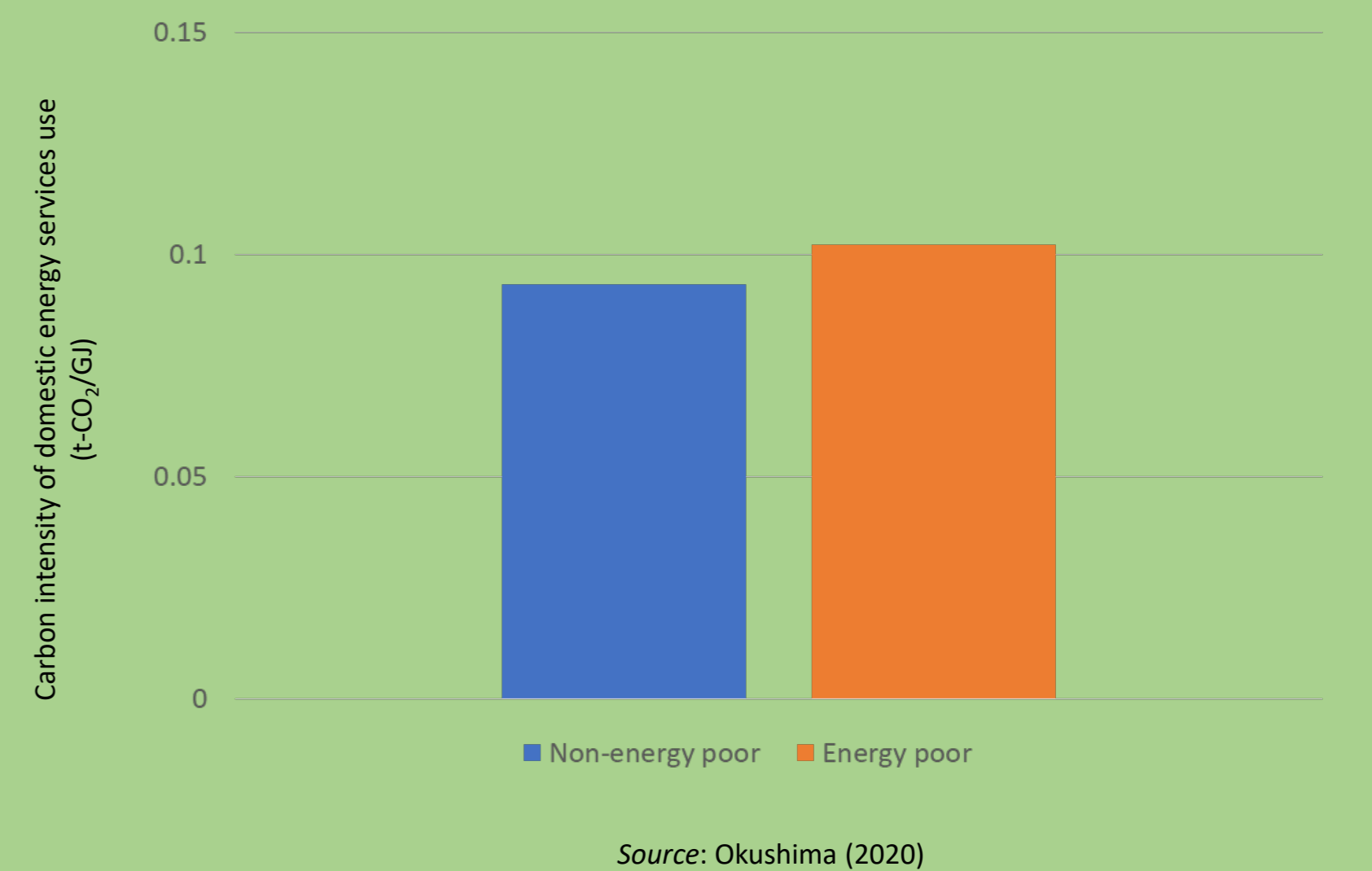
- There exists the energy poverty premium (EPP) in Japan: unit cost of energy for domestic energy services is higher for the energy poor than for the affluent population.
- The (energy) poor pay at higher prices for their essential energy services than the non-energy poor (more affluent people): the present disadvantage for the energy poor.



Source: Okushima (2019)

High carbon intensity (HCI) of the energy poor: future potential disadvantage for the energy poor

- The energy poor have higher carbon intensity of their domestic energy services than the non-energy poor (the affluent population).
- The energy poor are at a disadvantaged position in terms of "Access to low-carbon energy or technology."
- Deep decarbonization policy such as higher carbon pricing would exacerbate the energy poverty: the future potential disadvantage for the energy poor.



Source: Okushima (2020)

Policy we recommend: Low-carbon energy or technology for all, including the energy poor

- Ensuring the access to solar energy or technology for vulnerable or disadvantaged people, including low-income households or the energy poor.
- Providing low- or no-cost solar panels for them, or providing low- or no-cost electricity generated from community solar or publicly-owned solar facilities for them (Carley and Konisky, 2020).
- PPS (Power Producers and Suppliers) established by local governments are expected to play an active role in this context.



Community solar in Sanagochi Village, Tokushima

- Promoting other renewables, e.g. biomass energy, in line with the "local context" is also a fruitful option for ensuring an inclusive low-carbon energy transition in Japan.



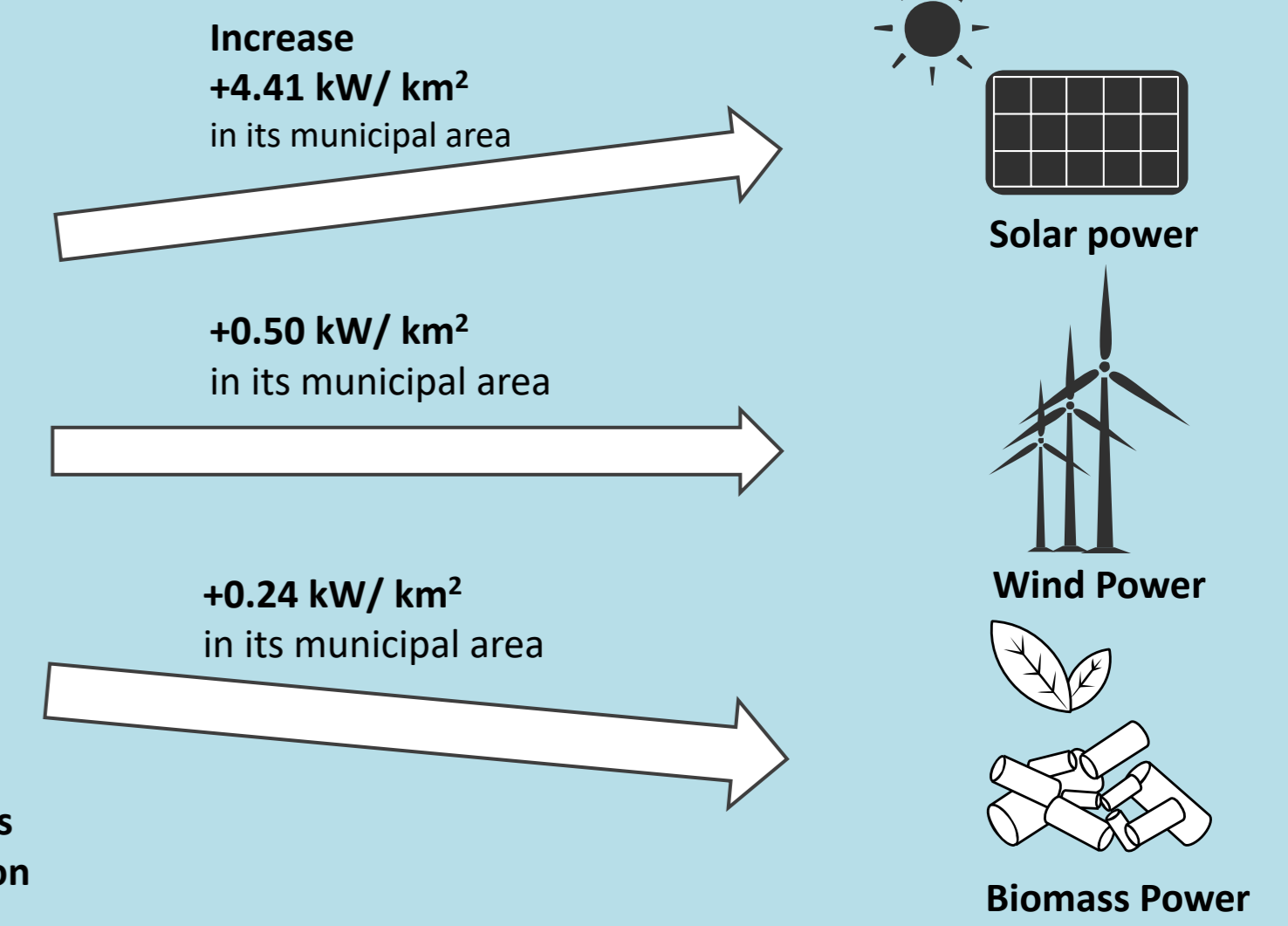
Woody bioenergy in Hanamaki City, Iwate



Firewood stove in Nishiwaga Town, Iwate

Municipalities have a vital role in a locally-initiated low-carbon energy transition

If a local government encourages renewable energy use under explicit written guidelines such as ordinances, plans, targets, or new energy visions, then



Methods: Propensity Score Analysis
Doubly Robust Estimation

Source: Masaya Tokutake (2020) Effects of Renewable Energy Policy in the Japanese Municipalities. Master Thesis, Master's program in Policy and Planning Sciences, University of Tsukuba.

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