Japan's Biomass Market Overview

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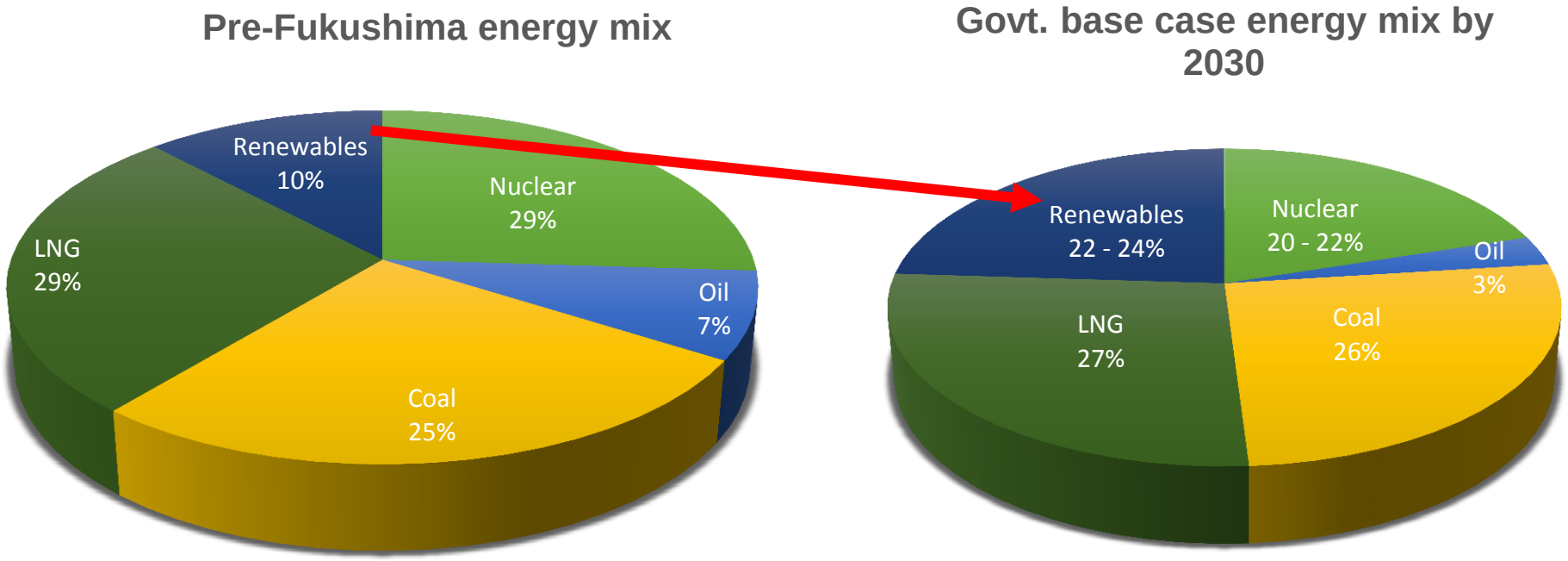
Japan Power Market Snapshot

- World's third largest economy and second largest electricity market in the OECD.
- Prior to the Fukushima Daiichi Nuclear Accident – power generation was dominated by fossil fuels (c.60%) and nuclear (c.30%).
- Post Fukushima Daiichi Nuclear Accident – big increase in fossil fuel imports for thermal generation, causing:
  - Increasing electricity prices
  - High dependency on imports
  - Increase in Japan's greenhouse gas emissions
- Energy policy has shifted – to reduce fossil fuel dependency:
  - **Changing power generation mix:** Shift away from nuclear and thermal power generation towards renewable energy, and expanding the mix of renewable power sources
  - **Market liberalization:** Liberalization of power generation, liberalization of retail supply, ensuring independence / fairness of transmission and distribution
  - **Rising awareness of energy conservation:** Efforts towards increased efficient energy usage.

A Changing Generation Mix

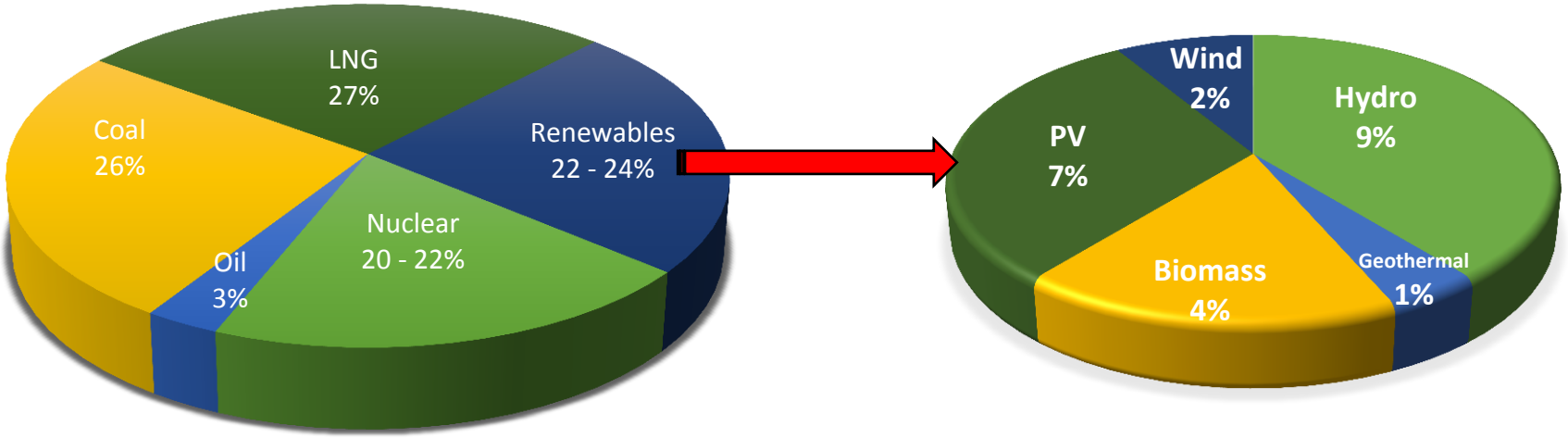
- Japan is looking to expand its renewable energy use to reduce its dependency on fossil fuels and secure energy supply.



Source: Ministry for Economy, Trade and Industry (METI)), Japan's Electricity Market Reform and Beyond, July 7, 2015

The Role of Biomass in the Generation Mix

- Japan has the 5th largest biomass market in the world - government aims to double biomass generation to 32.8 TWh in 2030.
- By 2030 Biomass is expected to comprise c.20% of renewables generation and attract c.20% of government incentives for renewable generation

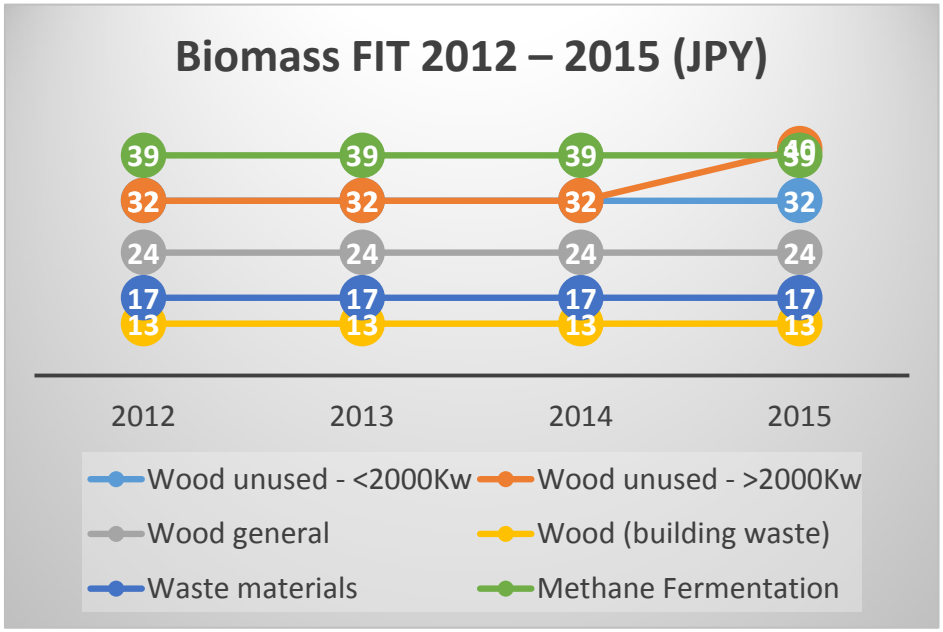


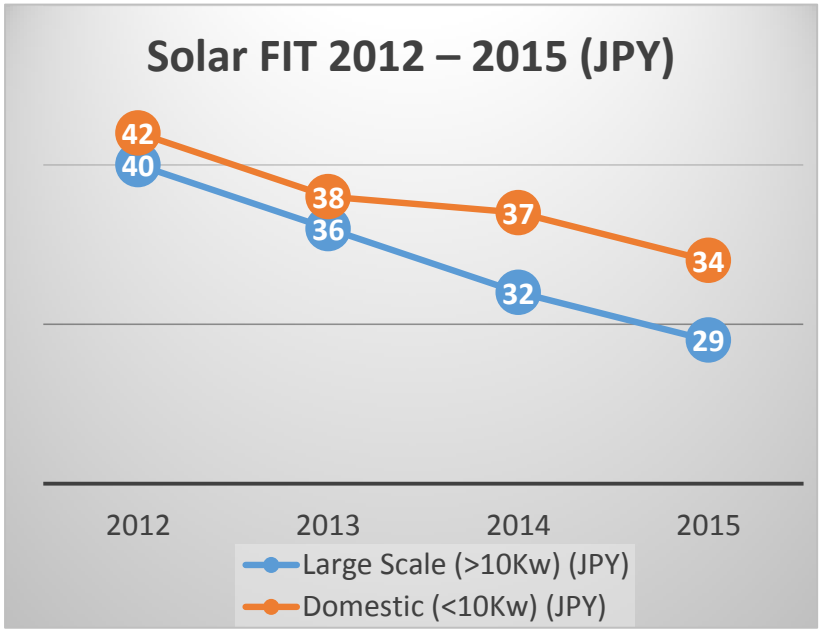
2030 JAPAN ELECTRICITY GENERATION MIX

Source: Ministry for Economy, Trade and Industry (METI)

Biomass Market Trends

- Stable feed in tariffs (FITs)
  - FITs for biomass projects remain comparatively attractive compared to other countries e.g. Germany, France and Spain.
  - FITs have remained stable across all biomass technologies, a positive signal when compared to other renewable energy technologies e.g. solar.





Source: Ministry for Economy, Trade and Industry(METI)
(http://www.meti.go.jp/english/press/2015/0319_01.html)

Biomass Market Trends

- Government sees the biomass as a key renewable energy source and has introduced a range of support measures
  - start-up grants to biomass-power producers
  - policies to assist in raw material procurement to boost the domestic biomass-power market
- Supply and demand of timber for wood based technologies
  - Japan has an abundance of unused timber. In the East, the supply of unused timber exceeds demand.
- Methane Fermentation Plants
  - Feedstock trends are shifting from the traditional livestock excreta and sewage sludge, to a composite of sewage sludge and food waste including industrial waste and food scraps.
  - High-rise buildings with “urban biogas systems” that recycle food waste are being implemented → this is seen as a potential growth market within the sector.

Biomass Market Trends

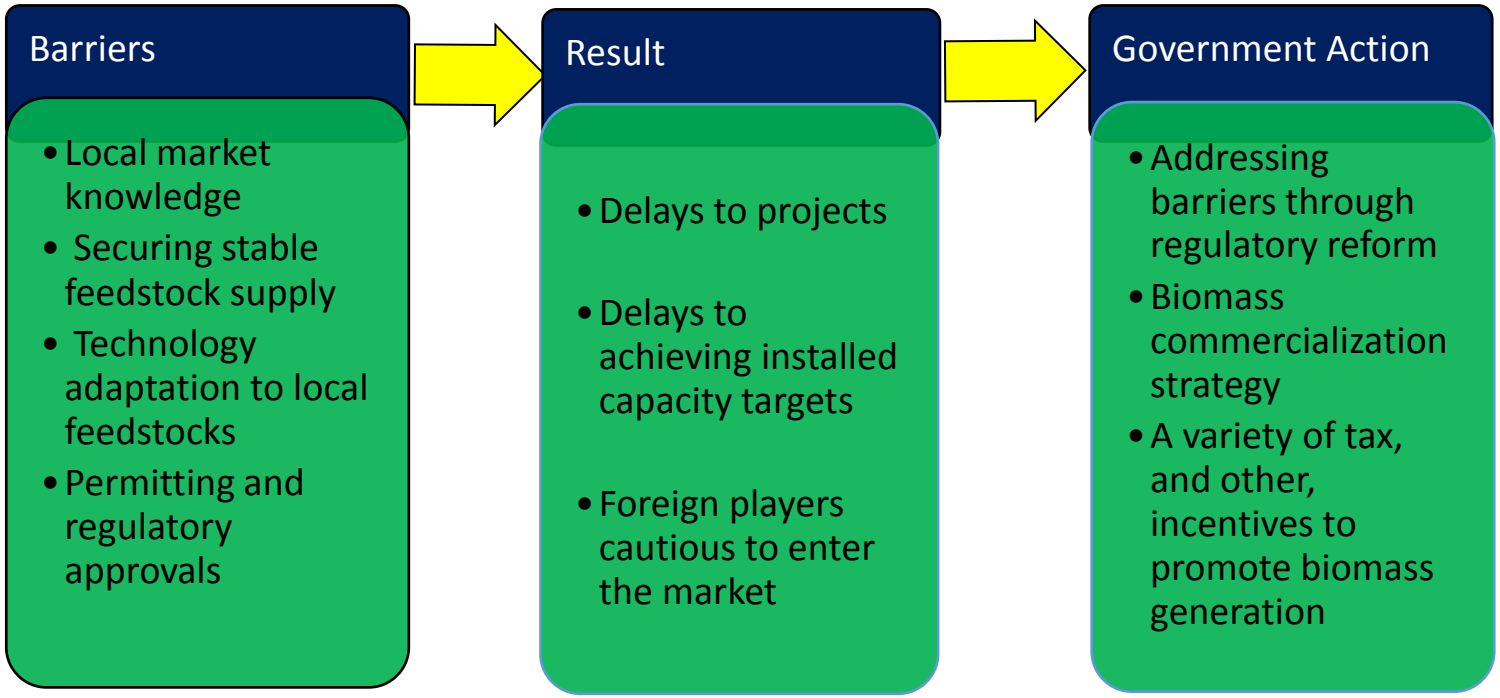
- Market liberalization - encouraging new entrants by opening up the power market to competition

2016
- Retail competition introduced to the residential sector in 2016
- consumers will likely drive demand for renewable energy

2018
- Abolishment of rate regulations
- Retail tariffs subject to market forces

2020
- Large power companies transmission and distribution operations unbundled
- Enhanced neutrality and transparency of transmission and distribution

Biomass Market Barriers to Entry



Accessing the Market through Partnership

- Given the unique characteristics of the Japanese market, many of foreign companies overcome barriers to entry by partnering with domestic players.
- There are a number of potential partners for foreign companies looking to expand their business in Japan.
- Partnership can take a myriad number of forms e.g. feedstock arrangements, technology alliances, joint ventures, value chain alliances.
- Success cases include:
  - General Electric Corp. – supplied gas engines to 15 domestic biomass power plants so far, and has also announced plans to pursue EPC (engineering, procurement and construction) for wood biomass pyrolysis gasification power plants.
  - Cornes & Company - designs, develops, and deploys livestock excreta-fueled methane fermentation plants. Its customers mainly consist of livestock farmers in Hokkaido.

How Can JETRO Help?

- Japan's core organization for promoting foreign direct investment (FDI) into Japan,
- Identifies companies interested in investing into Japan and supports them from the stage of business development to that of corporate establishment.
- Range of services to facilitate establishing a corporate presence in Japan
- No charge for assisting our registered clients