

Opportunities for US Wood Pellets in Japan

Presented by:

Dr. Ivan Eastin

School of Environment and Sustainability

University of Michigan



Topics

- US-Japan Trade Summary
- Japan Feed-in Tariff Program
- Japan Energy Policy
- Japan Bioenergy Sector
- Woody Biomass Supply Situation in Japan
- Opportunity for US Wood Pellets
 - Japan Trade Mission



US Wood Exports, by destination

	2016	2017	2018	2018/2017
Total	\$8,755,600,805	\$9,524,805,354	\$9,587,572,170	0.7%
China	\$2,543,027,783	\$3,193,772,042	\$2,868,250,123	-10.2%
Canada	\$1,987,923,926	\$1,989,949,345	\$2,031,399,289	2.1%
UK	\$753,121,034	\$730,152,924	\$846,859,034	16.0%
Japan	\$694,526,151	\$704,523,411	\$790,615,281	12.2%
Mexico	\$692,447,468	\$700,829,281	\$710,582,641	1.4%

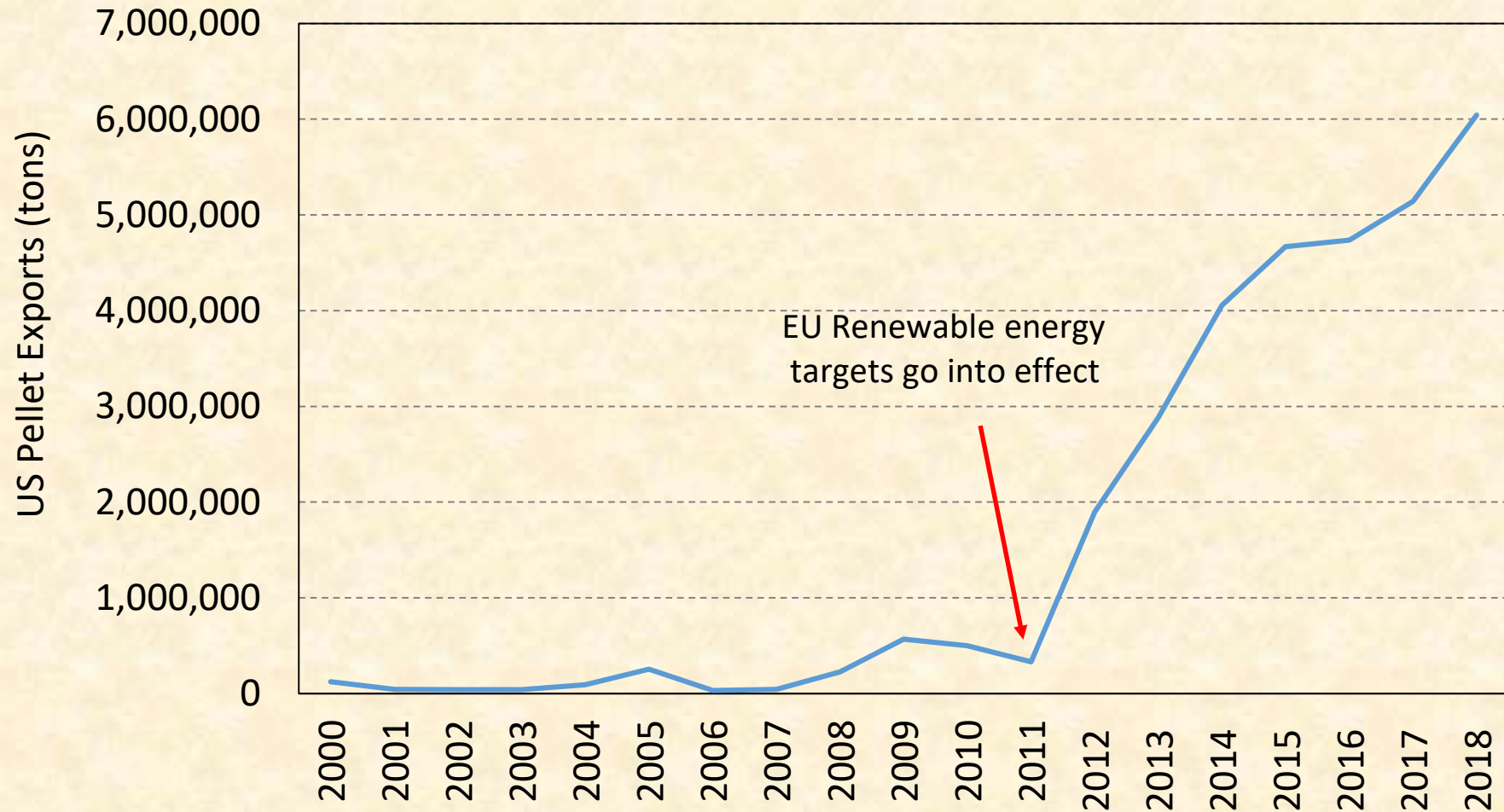
Japan is a major market for US wood products and there is a well established trade relationship between the US and Japan. Currently Japan is the 4th largest market for US wood products.

US Wood Exports to Japan

	2015	2016	2017	2018	2018/2017
Total	\$725,719,269	\$694,526,151	\$704,523,411	\$790,615,281	12.2%
Logs	\$385,432,428	\$387,286,837	\$393,519,700	\$436,386,098	10.9%
Lumber	\$183,217,733	\$156,290,094	\$153,729,997	\$159,493,708	3.7%
Chips	\$104,503,003	\$92,492,192	\$100,419,599	\$134,777,163	34.2%
Other	\$52,566,105	\$58,457,028	\$56,854,115	\$59,958,312	5.5%

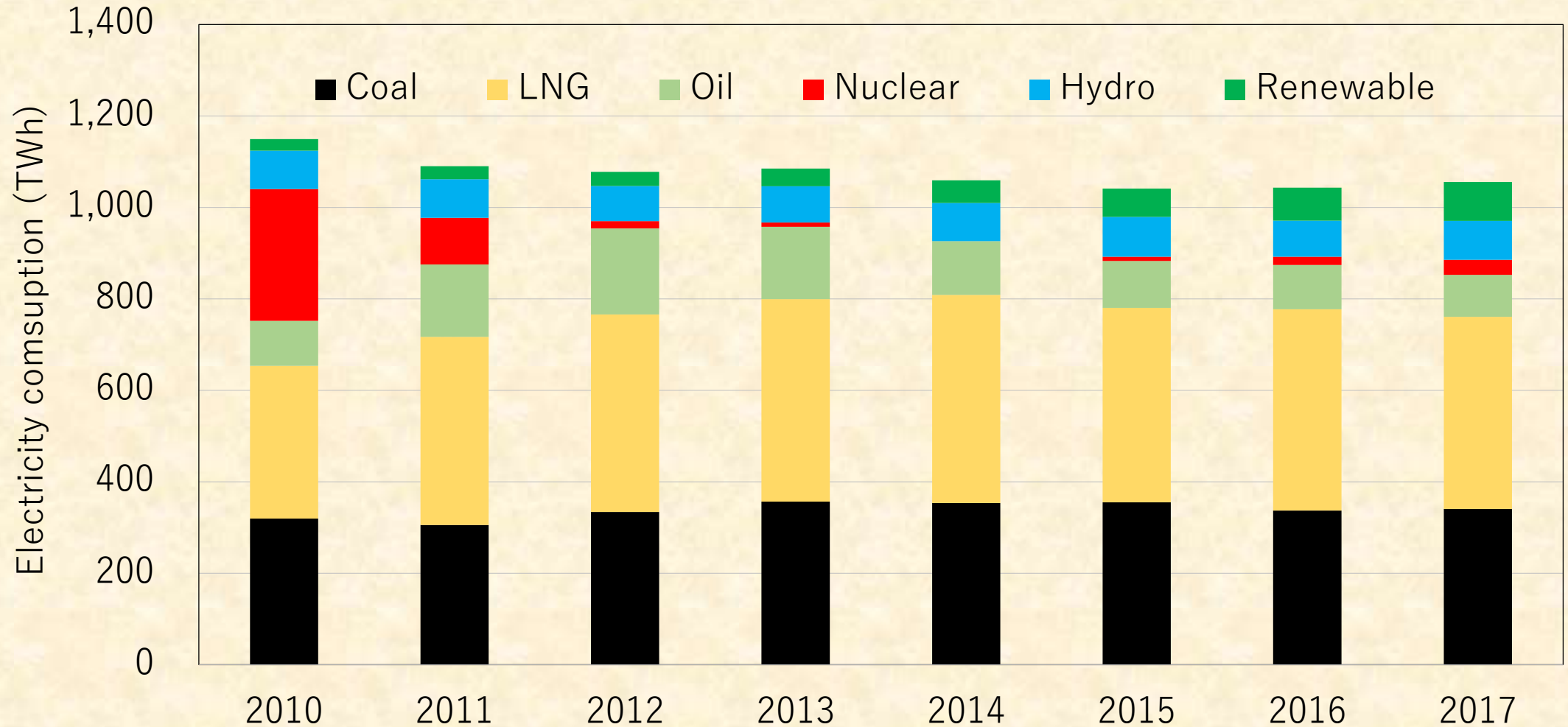
Exports grew across all product categories in 2018. Since 2015, export growth has been strongest for chips while pellet exports have been negligible (1,734 tons in 2018).

US Wood Pellet Exports (HS 4401.31)



Overall, US wood pellet exports have increased dramatically, primarily from the US south going to the UK (78% share in 2018).

Energy Shift in Japan Following Fukushima Disaster



Japan essentially closed all of their nuclear power plants after the Fukushima disaster in 2011. Despite the reopening of some nuclear power plants recently, there is tremendous public resistance against this. In addition, coal plants are being pushed to integrate renewables into their raw material mix. As a result, the share of renewable energy will increase substantially in the future.

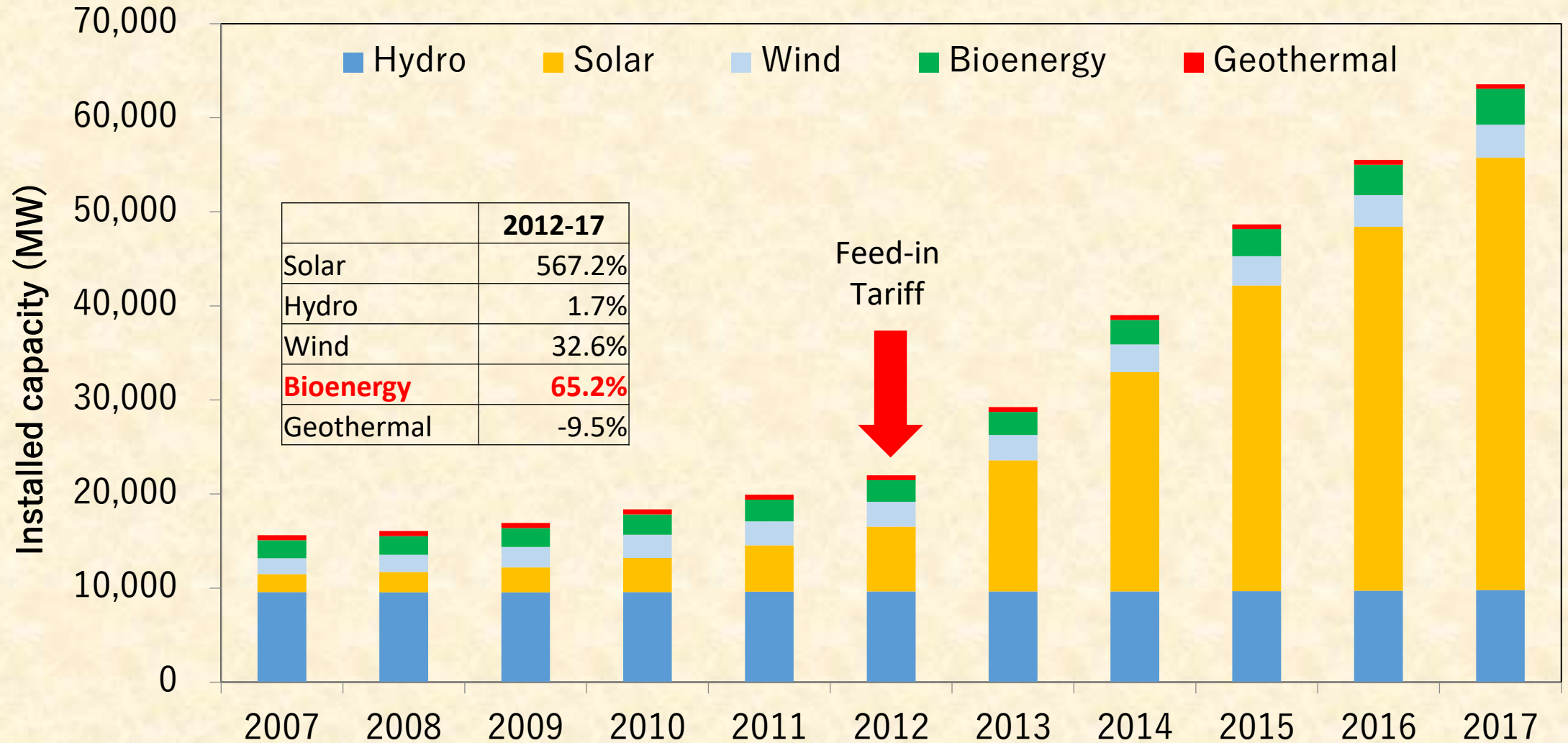
Japan Feed-In Tariff Program

- Goal is to reduce carbon emissions to help meet Kyoto Protocol commitment by increasing supply of energy derived from renewable sources and reducing share of nuclear and coal in the total energy supply
- Feed-in tariff program promotes use of wood within the bioenergy mix
 - FIT targets increased use of domestic wood, particularly wood derived from forest thinning operations
 - Tariff rates designed to generate an IRR of 8% (using ¥40/kWh) over 20 year contract
- Goal is to increase electricity derived from renewable sources from 12% in 2015 to 23% in 2030.

Feed-in Tariff Rates for Biomaterials in 2019 (yen/kWh)

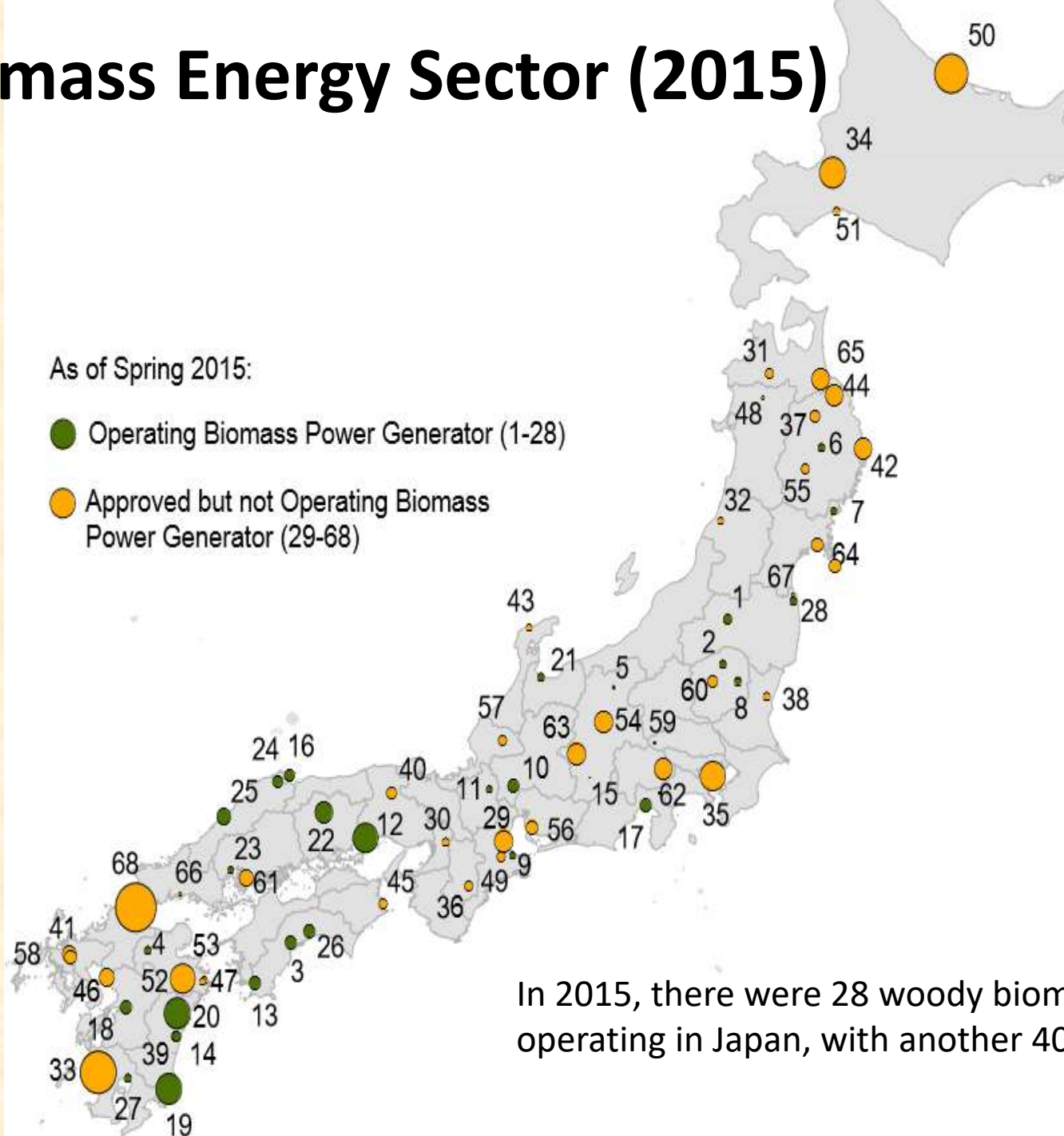
Unutilized wood (Domestic wood)		Ordinary Wood (Imported wood and PKS)		Recycled wood (Construction waste)	Methane gas	Other Biomass
<2000kw	>2000kw	<2000kw	>2000kw			
¥40	¥32	¥24	¥21	¥13	¥39	¥17

Installed capacity of renewable energy



Wood-based bioenergy has experienced the second largest growth rate since the introduction of the FIT program in 2012 and is expected to increase substantially in the future.

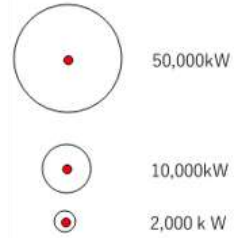
Japan Biomass Energy Sector (2015)



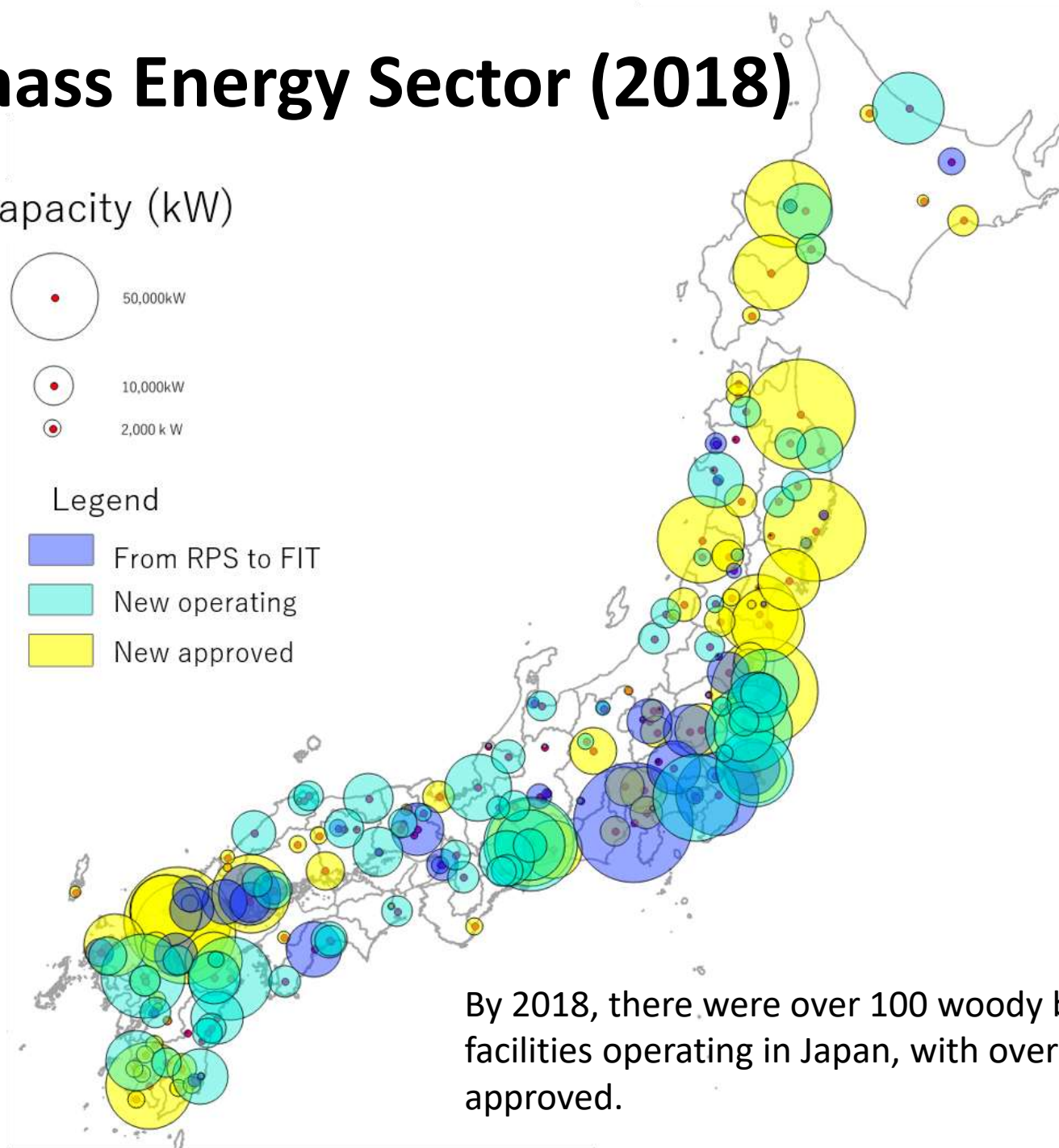
In 2015, there were 28 woody biomass energy facilities operating in Japan, with another 40 facilities approved.

Japan Biomass Energy Sector (2018)

Capacity (kW)

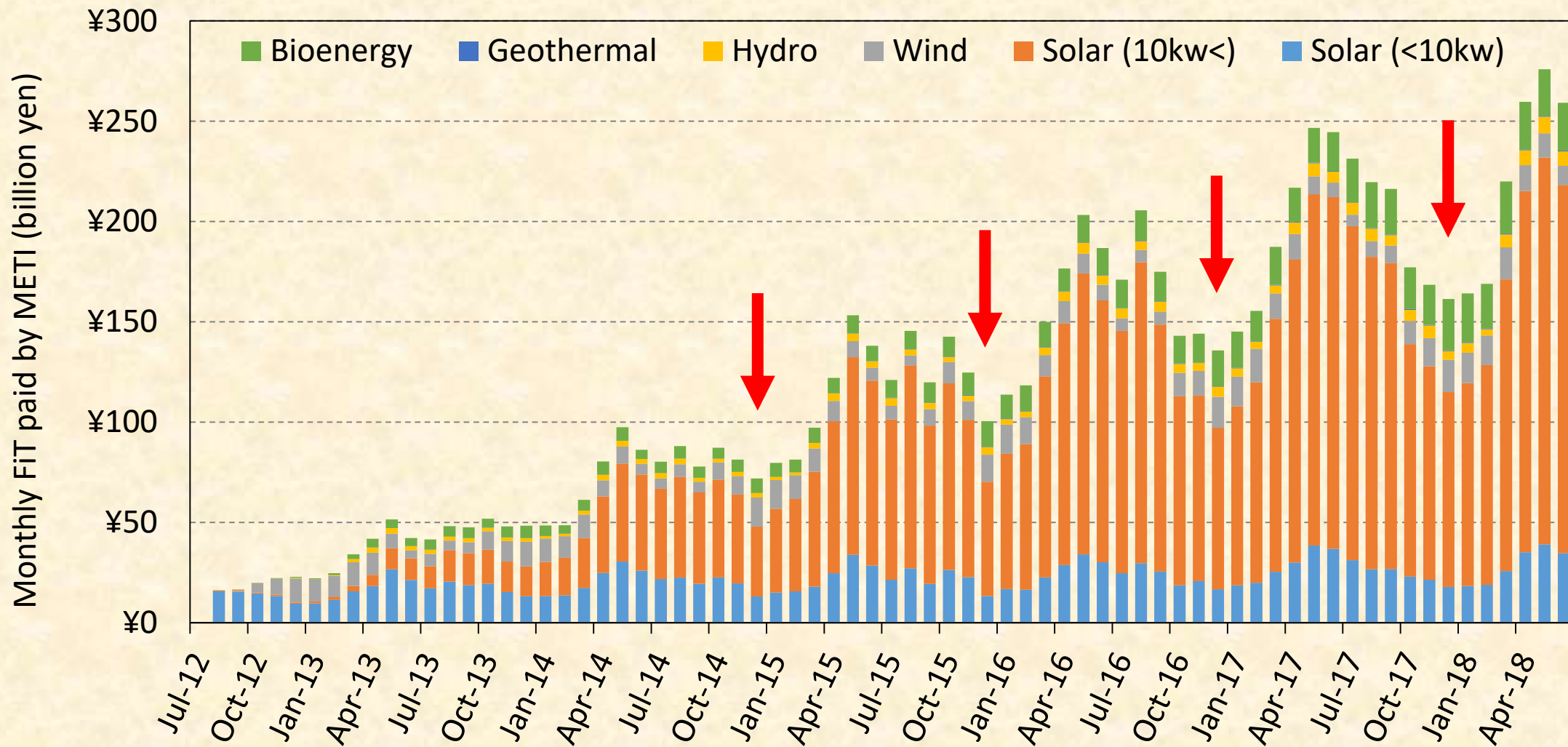


Legend



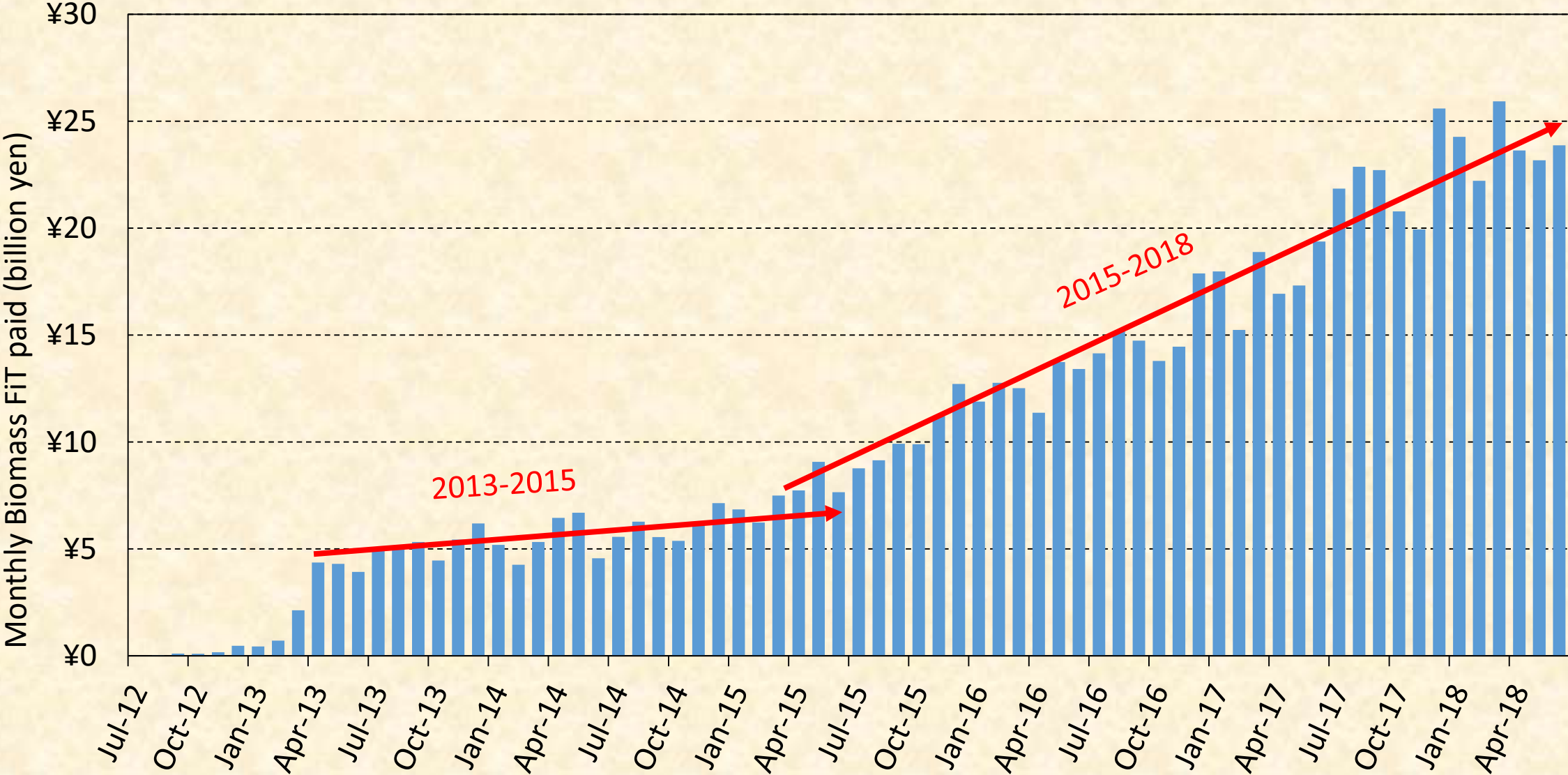
By 2018, there were over 100 woody biomass energy facilities operating in Japan, with over 300 new facilities approved.

Growth of Japan Feed-In Tariff Program



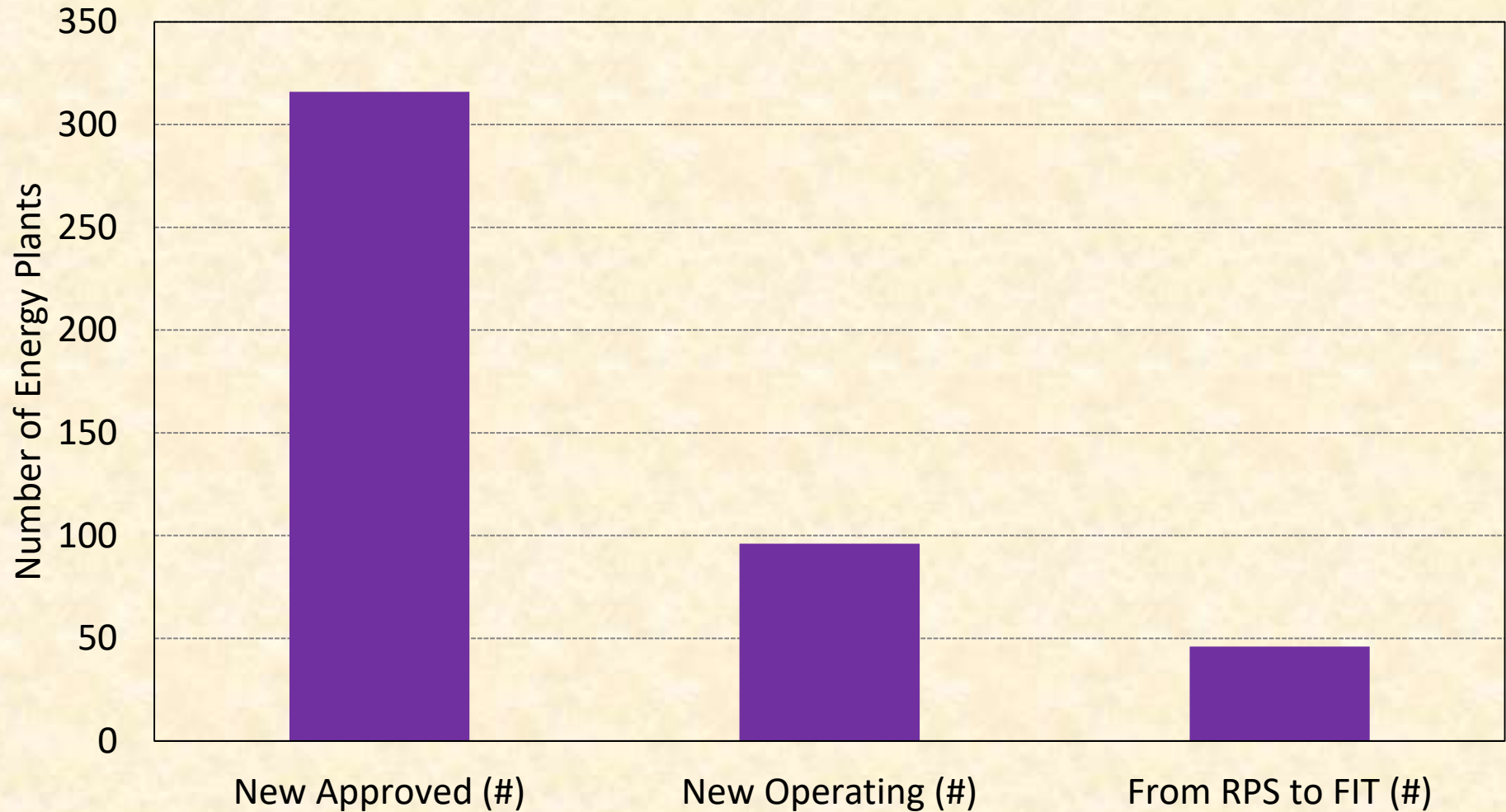
The share of FIT payments to woody biomass facilities has grown to 9.2% of the total renewable energy supply. Note the seasonality of solar, wind and geothermal energy supplies. This is a major concern to the energy industry and therefore biomass power is becoming more favored.

Growth of Japan Biomass Feed-In Tariff Program



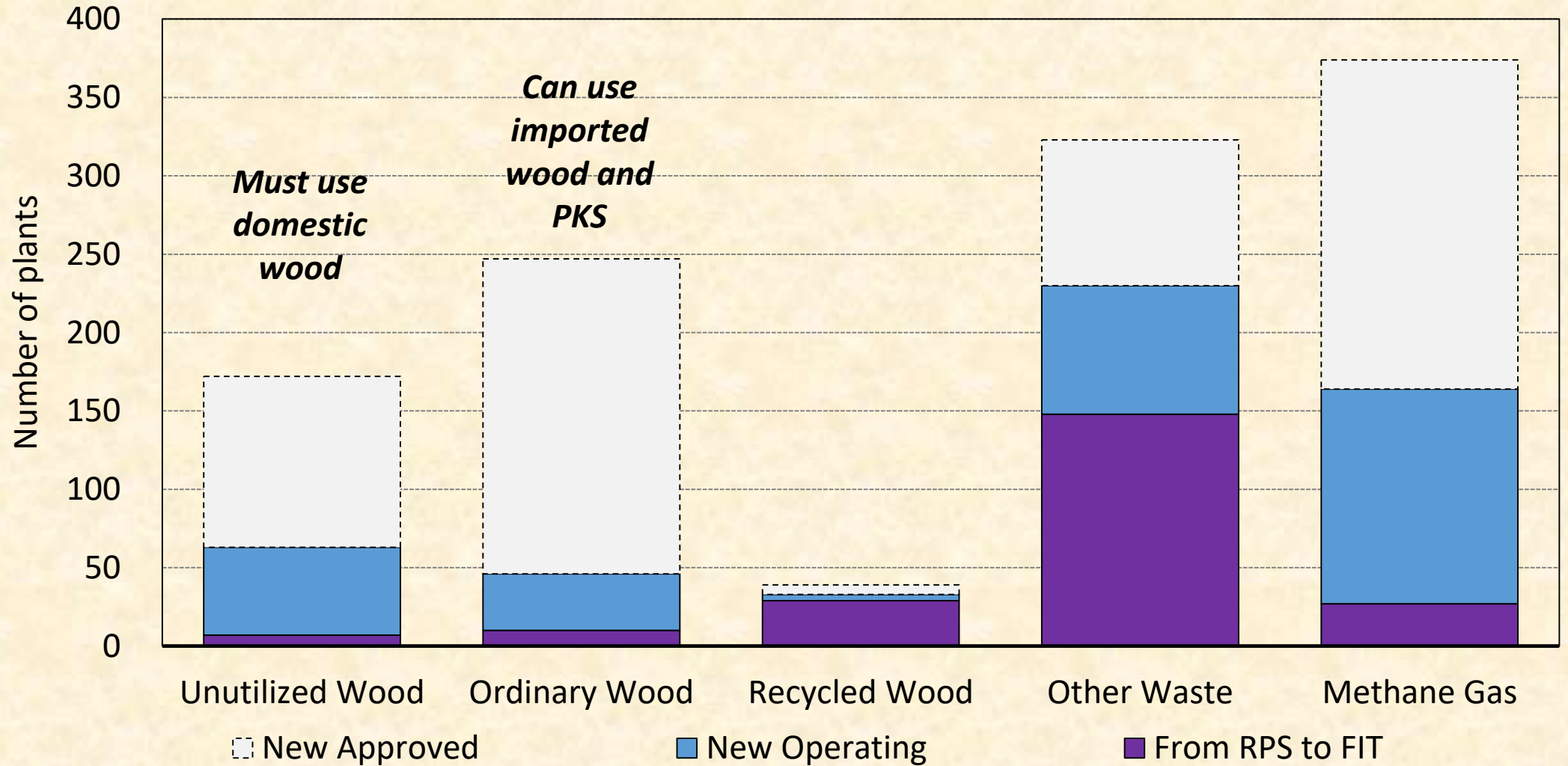
In part due to its reliability, FIT payments for woody biomass energy have increased rapidly since 2015.

Japan Woody Bioenergy Sector Expansion



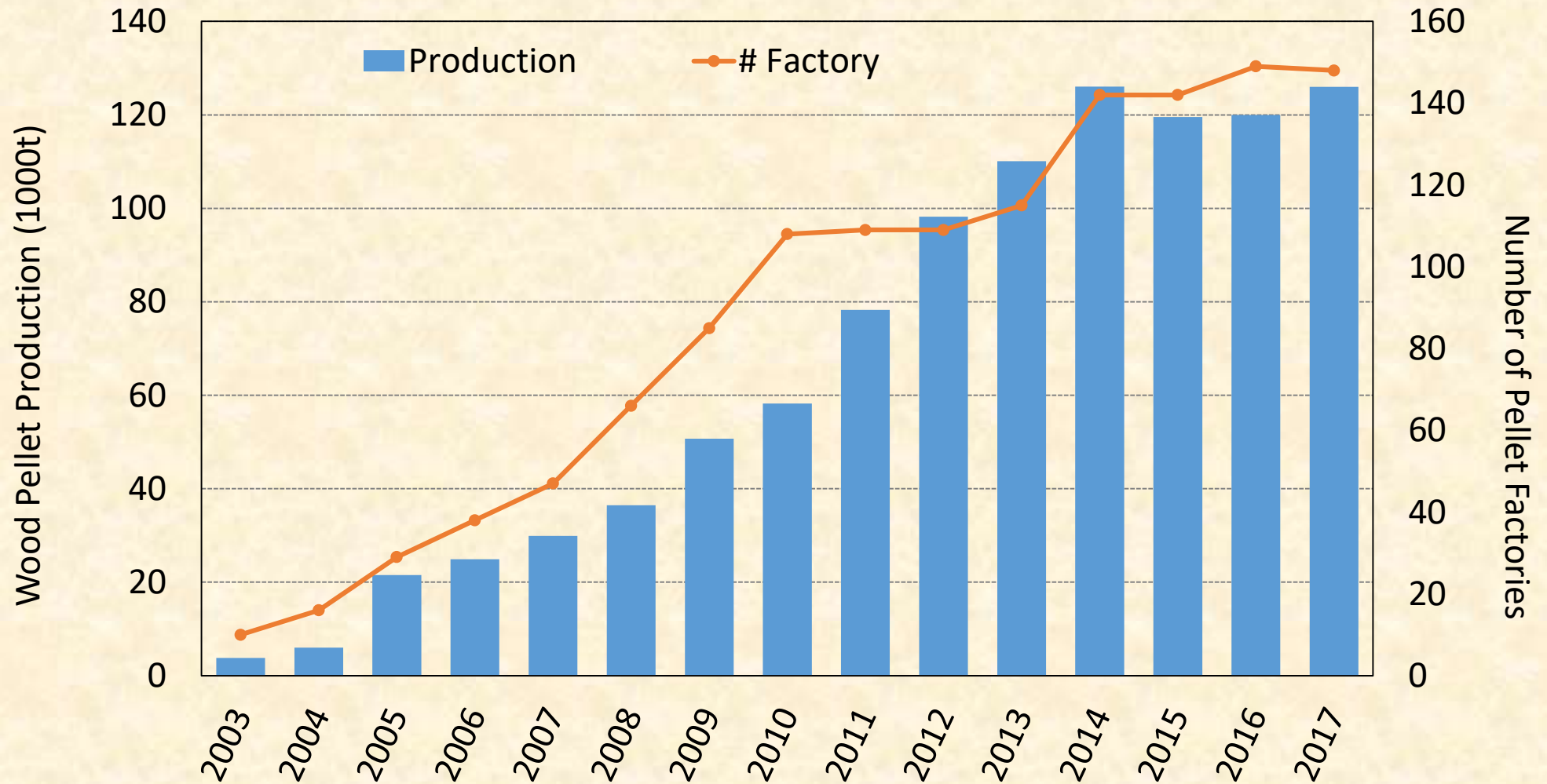
While not all new approved woody biomass plants will actually be built, the number of energy plants using woody biomass is expected to more than double, and more importantly the average plant size will increase substantially in the future.

Japan Bioenergy Sector Expansion



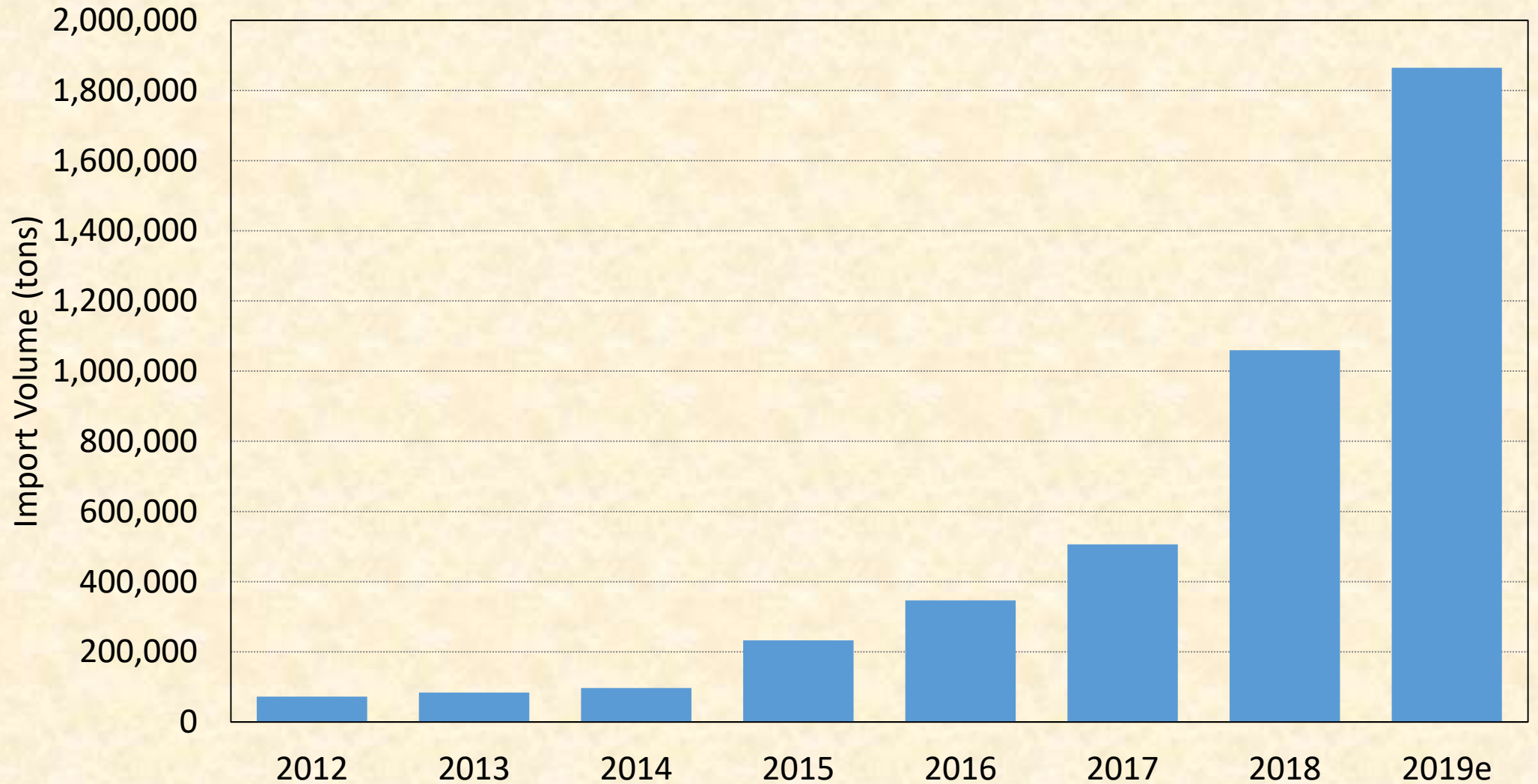
The newly approved capacity expansion far exceeds Japan's domestic supply of wood. Therefore there is strong interest in developing long-term supplies of sustainably sourced raw materials.

Japan Wood Pellet Production



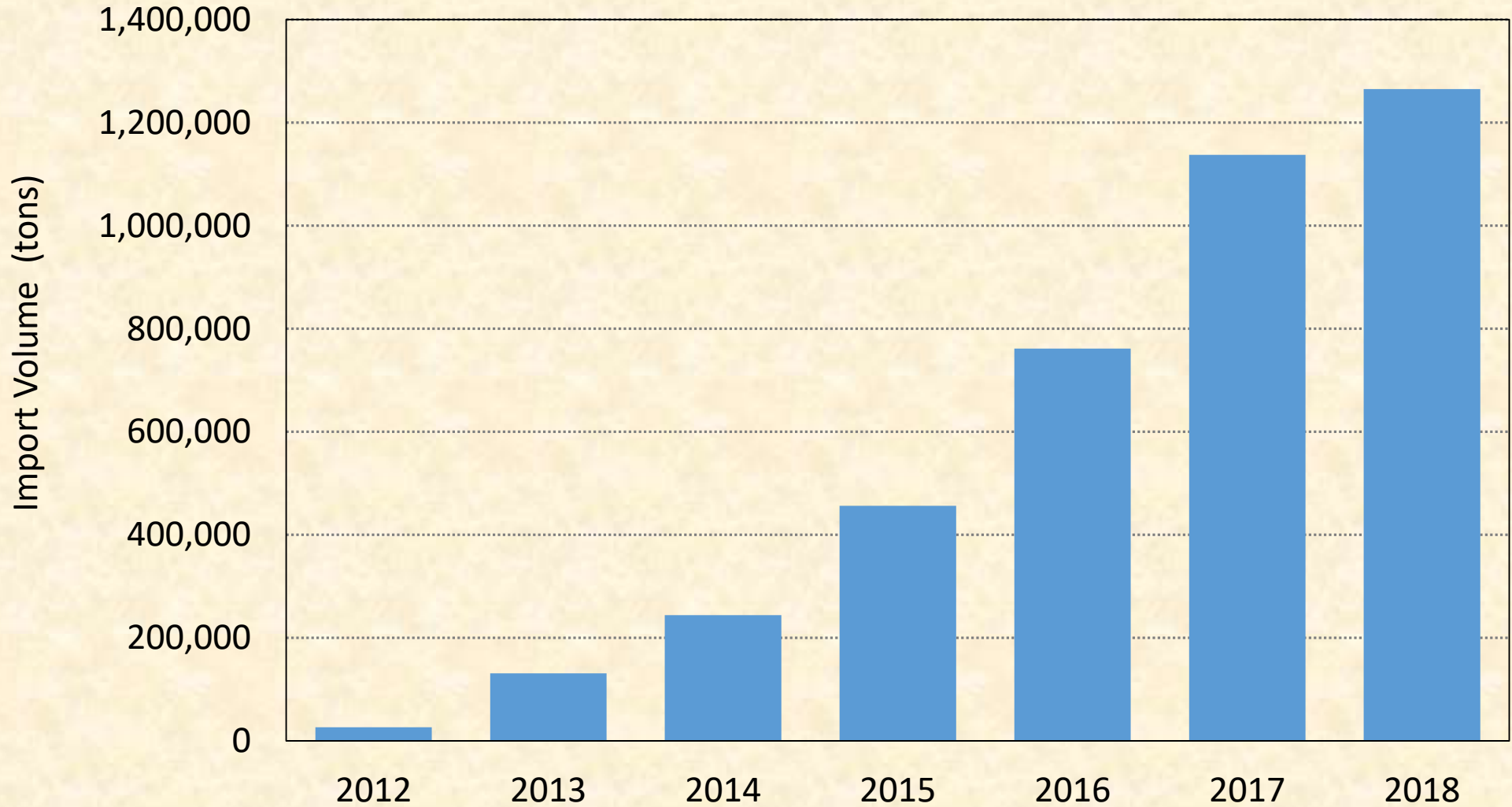
While there was some expansion of domestic wood pellet production following the implementation of the FIT program, this has largely levelled off since 2014. Given supply constraints, domestic wood pellet production is not expected to increase substantially in the future.

Japan Wood Pellet Imports



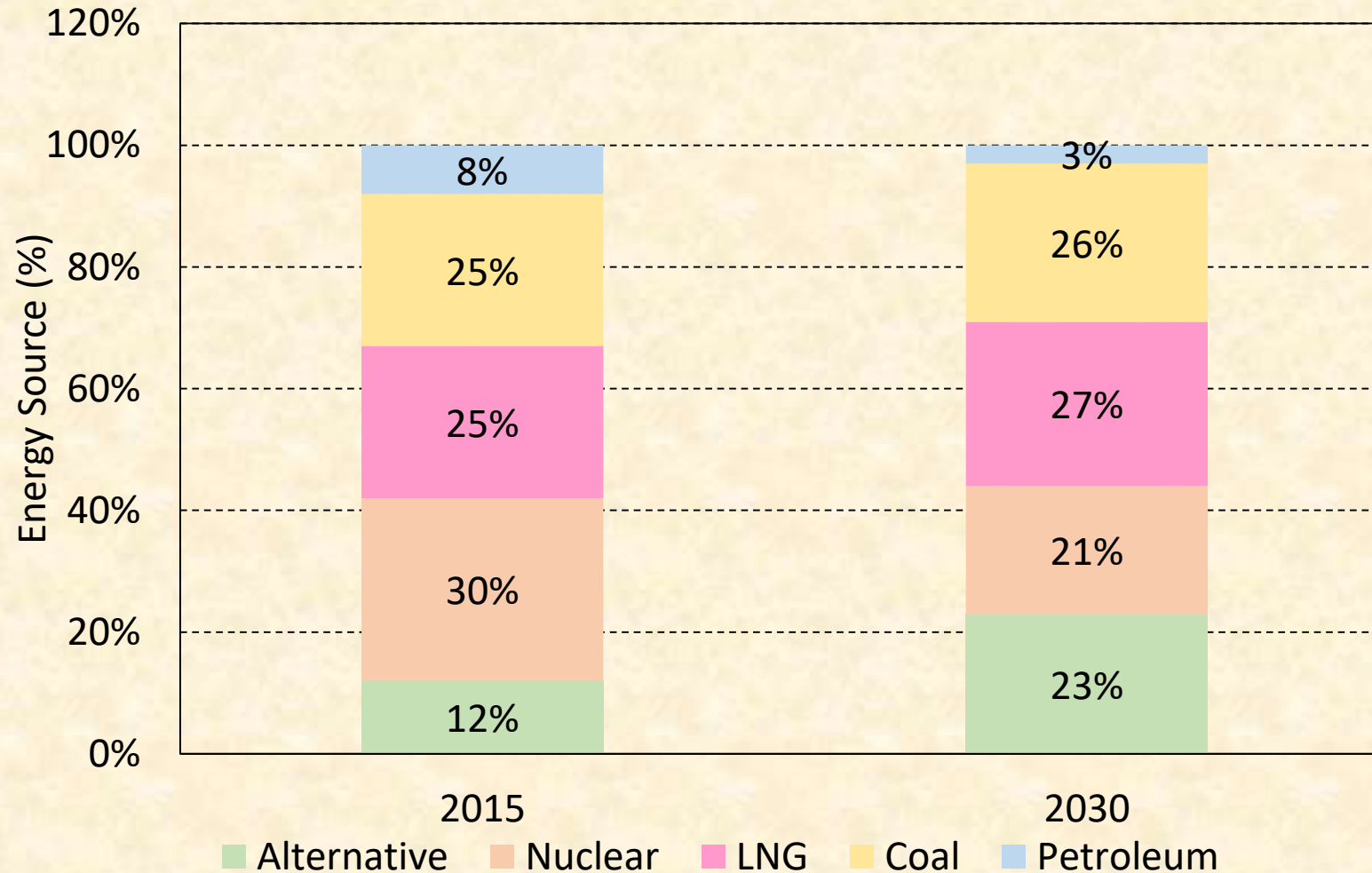
With the domestic supply of woody biomass constrained, imports of wood pellets have increased rapidly (primarily from Canada and Vietnam) jumped in 2018 and are up by an additional 76% in 2019

Japan Palm Kernel Shell (PKS) Imports



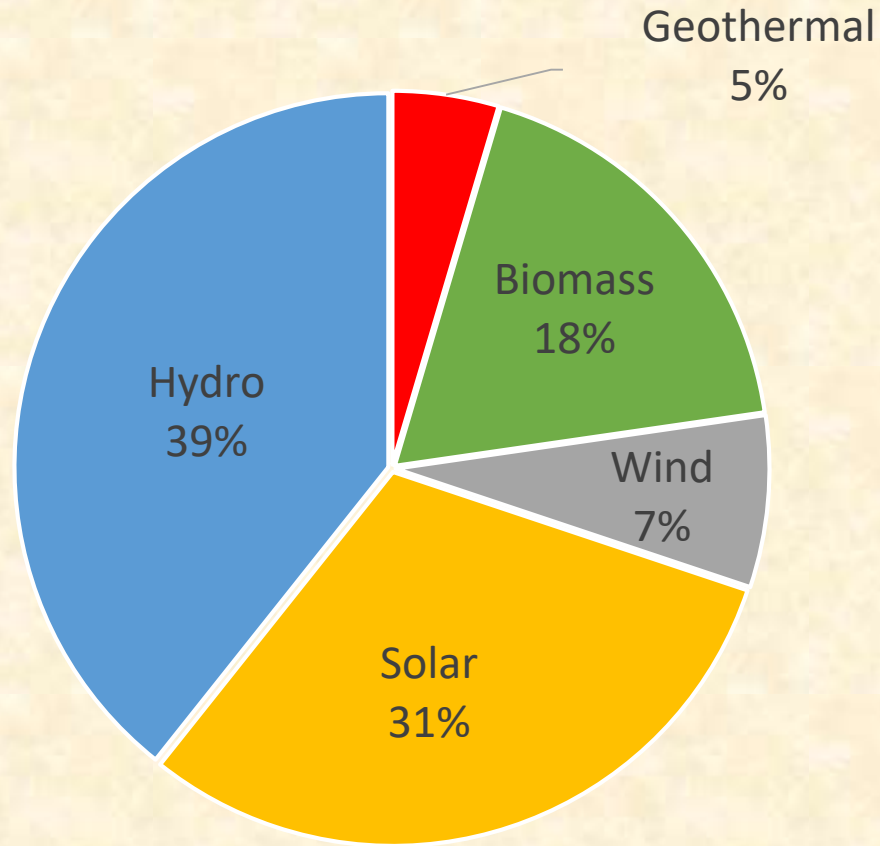
In addition, many energy producers are using palm kernel shells as a raw material input, especially coal-fired facilities. Almost all PKS are imported from Indonesia and Malaysia where there are concerns about sustainability.

Japan Electricity Mix 2015 vs. 2030



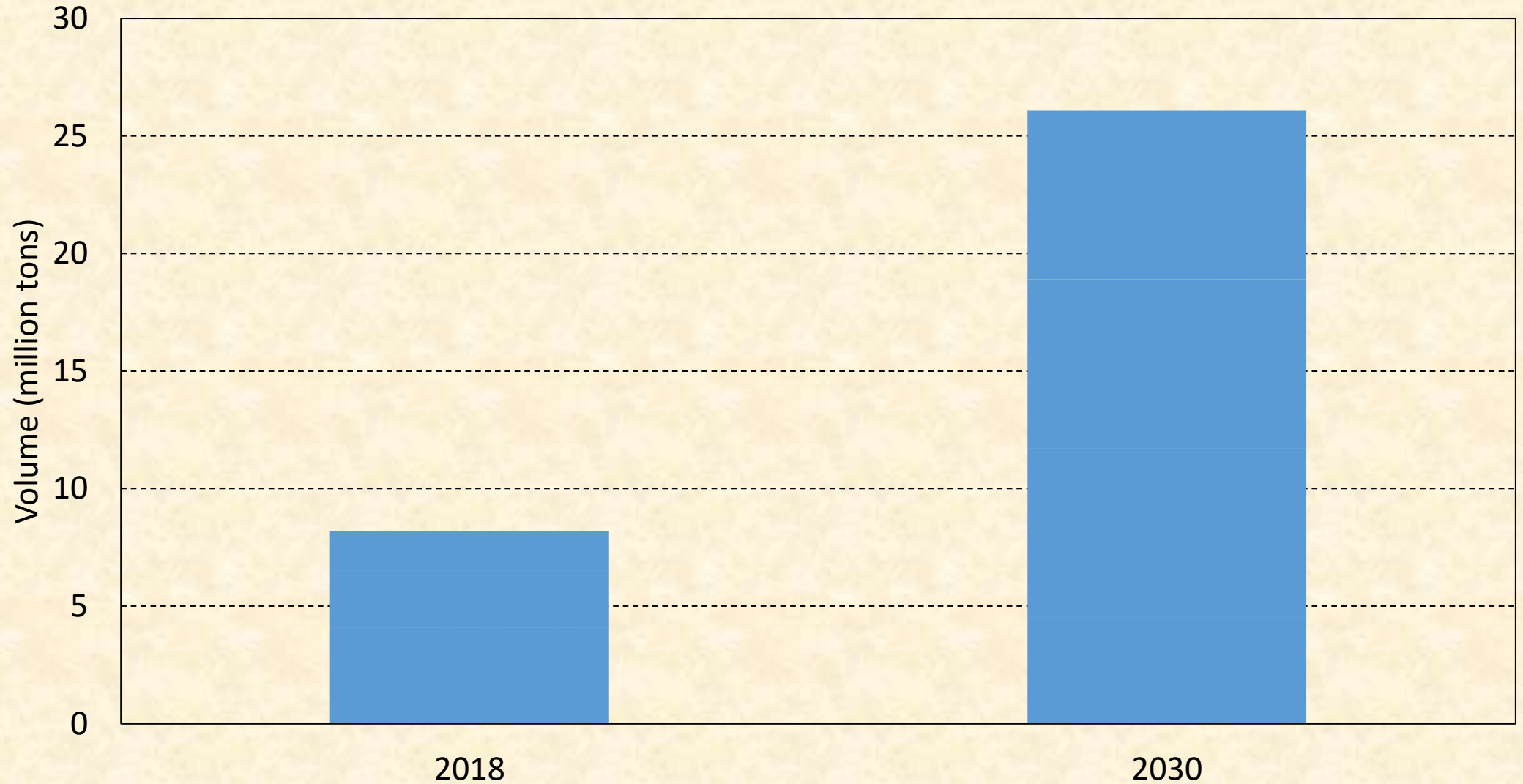
Looking forward, METI projects that the share of renewable energy will increase from 12% to 23% by 2030 while other energy sources are projected to remain flat or decline. As mentioned previously, the coal industry will incorporate growing amounts of wood pellets and PKS into their raw material mix.

Japan Renewable Mix for 2030



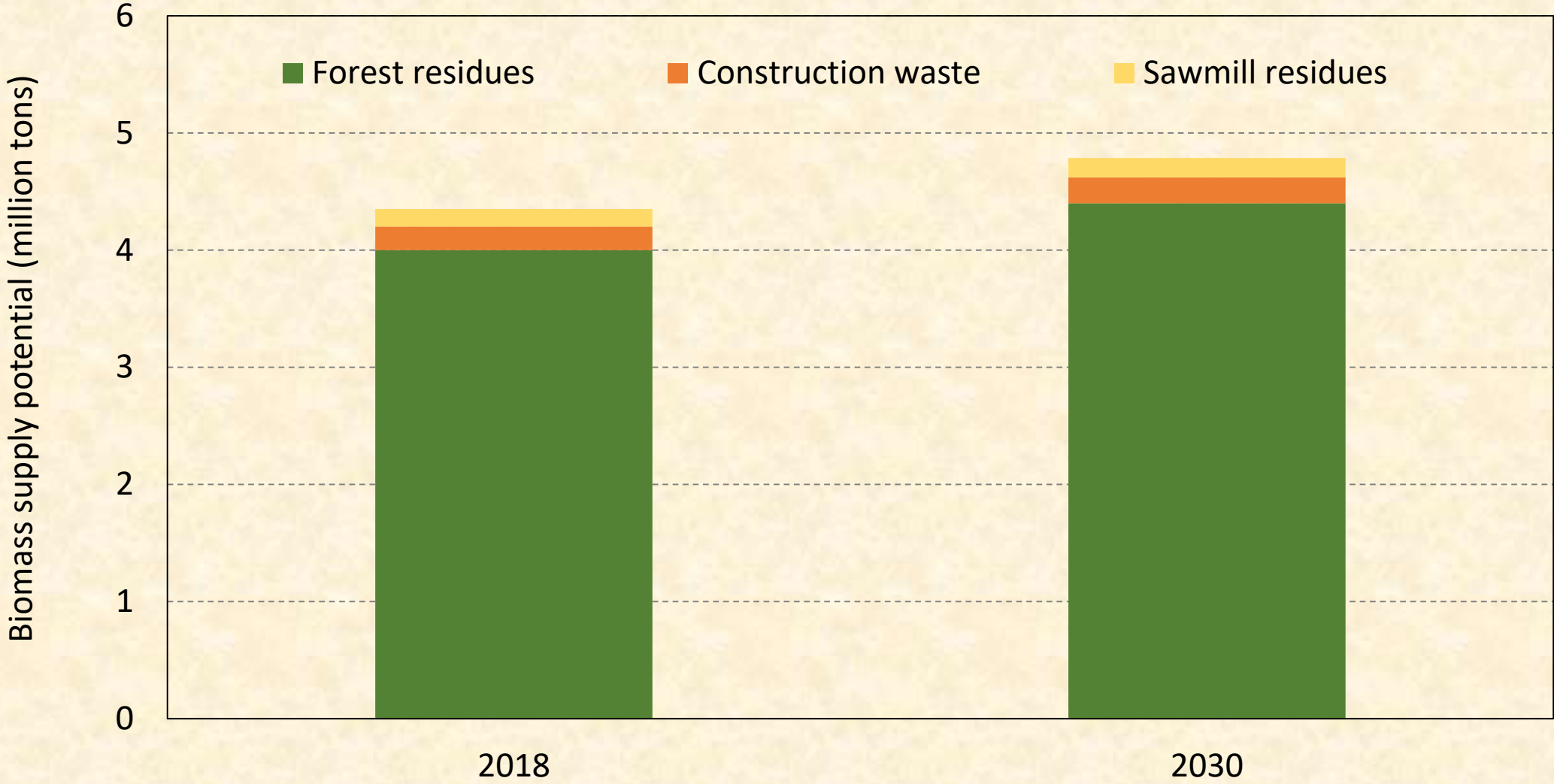
Woody biomass is projected to account for 18% of the renewable energy supply in 2030

Wood Fuel Demand 2018 vs. 2030



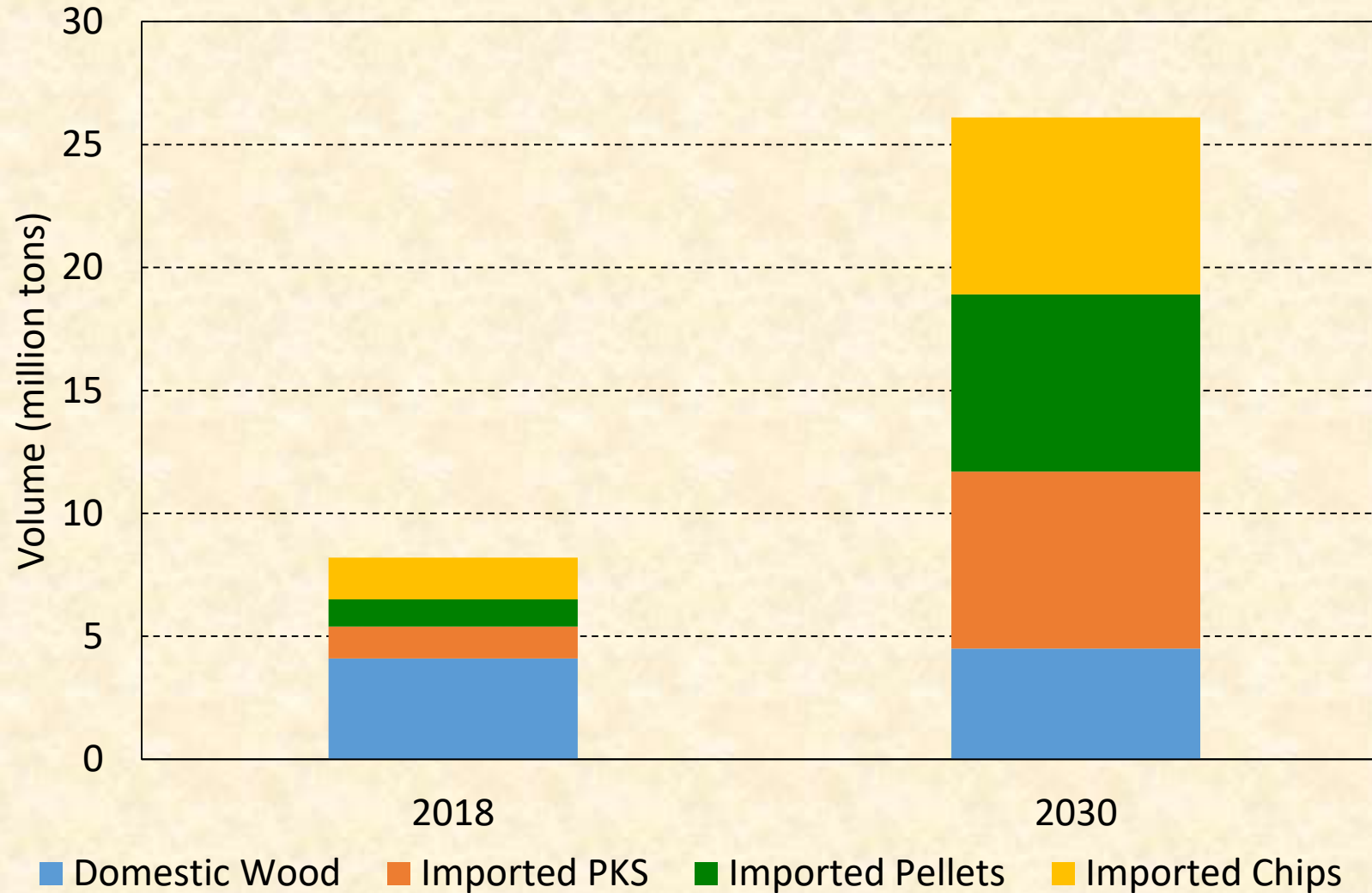
To meet these growth targets, the demand for woody biomass is projected to increase by over 3 times by 2030.

Domestic Wood Supply in Japan



However, the domestic supply of woody biomass is significantly constrained and is expected to increase by less than 10% by 2030, leaving a significant supply gap.

Wood Fuel Demand 2018 vs. 2030



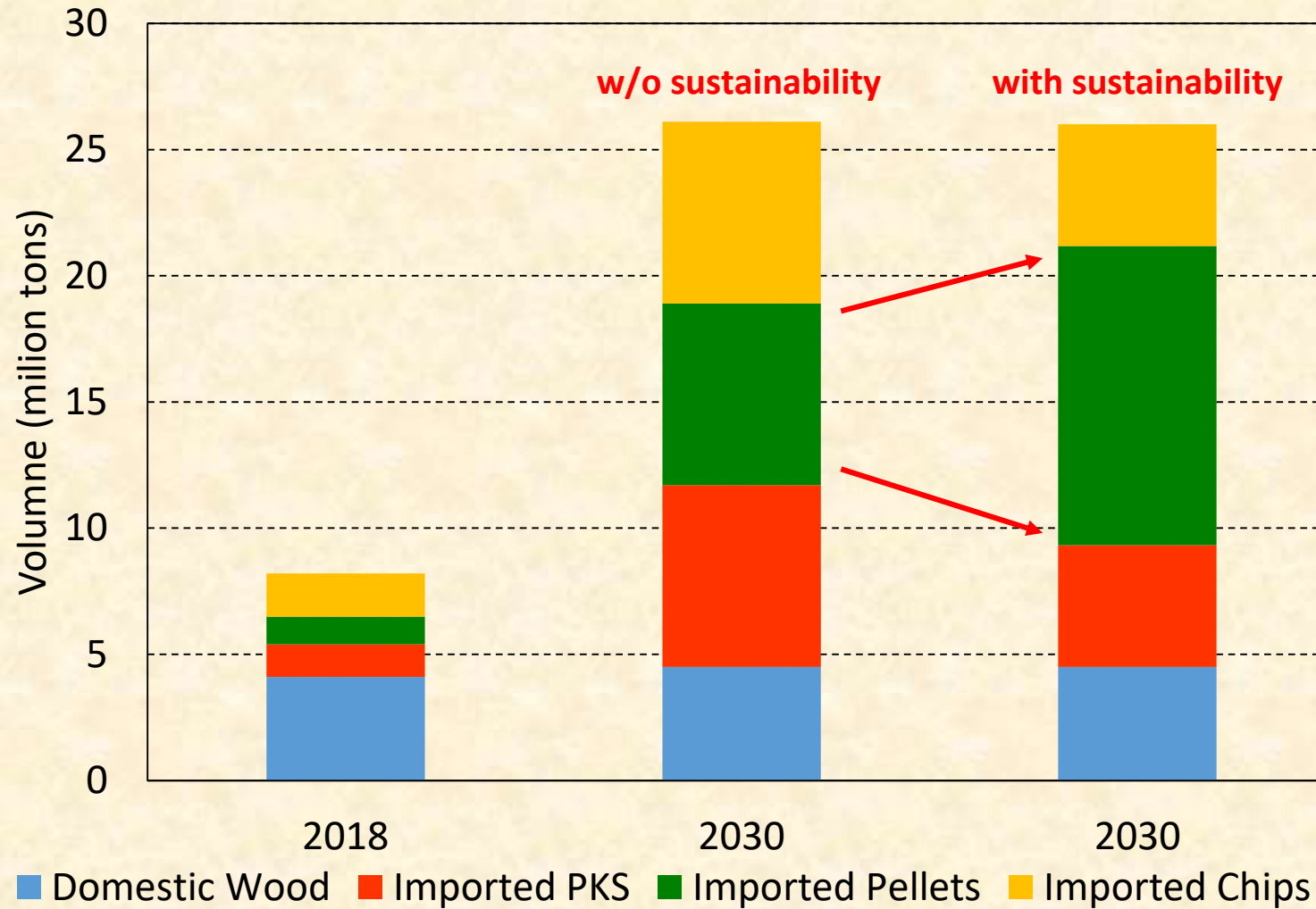
The supply deficit will be made up by increased imports of wood pellets, wood chips and PKS. Assuming an even distribution across all three products, wood pellet imports would increase by about 6 million tons.

But...Is all Biomass Considered Equal?

- Power companies favor PKS and wood pellets over wood chips
- GoJ is considering requiring that any raw material used within the FIT program must be derived from sustainable sources
 - This requirement would be difficult to achieve for PKS from Indonesia and Malaysia given widespread concerns over clearcutting of tropical forests for conversion to oil palm plantations
- If we conservatively assume that these factors would reduce demand for wood chips and PKS in Japan by about 1/3, what does the raw material mix look like in 2030?

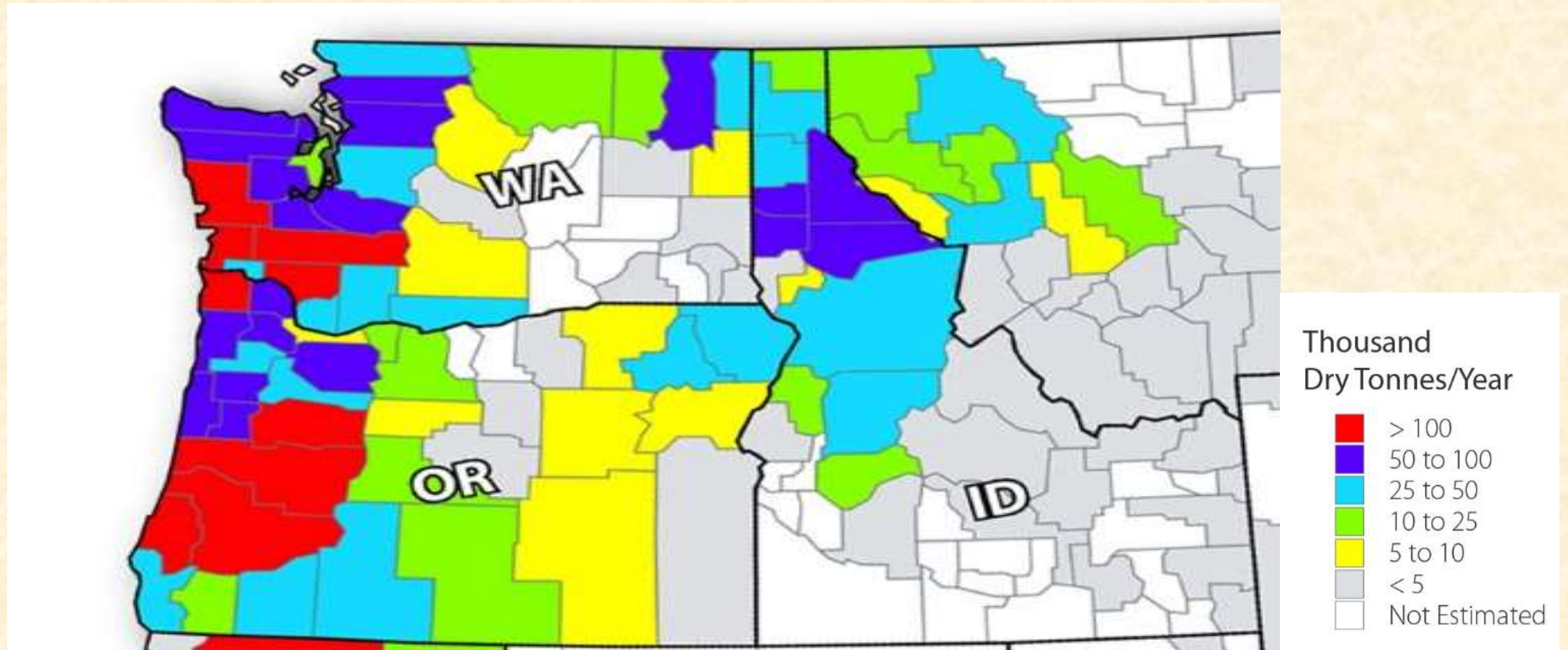
Wood Fuel Demand 2018 vs. 2030

if sustainability is required



If sustainability is required, Japan's demand for imported wood pellets in 2030 could increase to over 12 million tons per year (from just over 1 million tons in 2018).

Biomass Availability in the US PNW Region



While the PNW is currently not a major producer or exporter of wood pellets, the potential supply of woody biomass derived from forest thinning and forest health operations in the western US is substantial. Could this resource support an export-oriented wood pellet industry?

Assessing the Opportunity for US Wood Pellets from the western US in Japan

To help the forest products industry assess the market potential for wood pellets in Japan, the Center for the International Trade in Forest Products (CINTRAFOR) in the School of Environmental and Forest Sciences at the University of Washington is sponsoring a trade mission to Japan to explore the market opportunities for wood pellets exported from the western US. CINTRAFOR is expecting to cover airfare and hotel expenses for the trade mission participants. If you are interested in learning more about the trade mission, please reach out to:

Dr. Indroneil Ganguly

(206) 685-8311

indro@uw.edu