

The pioneering transatlantic shipment from Canada to Sweden that launched the International Industrial Wood Pellet Trade
“MANDARIN MOON”



Loading Port of Prince Rupert, BC Canada - February 19, 1998



Discharging Port of Helsingborg, Sweden – April 6, 1998

The development of the International Trade of Industrial Wood Pellets Globally, started here in Sweden by the invasion of Canadian wood pellets to Sweden by the landing of the “Mandarin Moon” in April of 1998 on Helsingborg. This shipment was the first of many to follow, demonstrating that biomass in the correct form and consistency will transport anywhere in the world.

The story behind the first shipment from the West Coast of Canada to the West Coast of Sweden

- The motive was **“Desperation”** The seller “Pacific BioEnergy” desperately needed a customer for their production, and the buyer “Helsingborg Energi” (as was the name of the utility at that time) desperately needed a carbon neutral fuel switch to reduce it’s CO2 emissions and avoid a serious carbon tax.
- How did desperation develop to the success of the first shipment of wood pellets from Canada to Sweden?
Was an exercise of **“we (I) didn’t know what I don’t know”**
- Negotiating the supply agreement:
 - The Swedish Standard SS ISO 1928 (1995) utilized to calculate the energy value for the final ton price determination “although under a new ISO standard, this method is still used today”
- Logistics – the contract was CIF, which meant we’re to deliver, **“how hard could that be”** we (I) signed the contract without any logistics arrangements (or knowledge of)
 - Shipping – things like charter parties, parcel cargo shipments, demurrage always in the ship owners favor of coarse, dead freight, berthing rights, laycan days, rain delays etc.
 - Shiploading – a port for shiploading, product receiving or storage had to be selected and negotiated.
 - Railway – negotiating a pull rate per car, leasing railcars and also demurrage issues. Also we learnt real early railroads can be quite unreliable (service failures).
 - Railcar loading terminal
- Production – 1st shipment date moved up 6 months
 - Operation debug – cutting open 9000 ton of bagged product
 - Pellets bought from other pellet producers – Pinnacle (now Drax), Princeton (also now Drax) and Barhead which became the first co-mingling exercise.

Distance from Prince Rupert to Helsingborg via the Panama Canal – just under 17,000 km

Distance from Prince George to Prince Rupert BC – just over 700 km

The experience: Facing the challenges:

Supply Agreement:

- **A visit with a key individual at the Swedish Research Institute in Boras was instrumental to understand SS ISO 1928 (1995)**

Logistics':

- **Railcars were loaded at CN Railroads yard in Prince George with a grain belt conveyor**
- **Over 120 railcars were leased from several leasing companies**
- **An agreement was made with Continental Grain, a terminal operation (now a container port) in Prince Rupert to receive and store up to 4000 ton and load the remaining 120 railcars directly to the vessel.**
- **With consulting assistance of Staffan Melin (who some of you know well), we managed to conclude a charter party with a Swedish shipbroker to lift the first 4 cargoes to Helsingborg.**

Shiploading:

- **An antiquated shiploader managed to perform at about 250 – 300 tph. Ship loading rate we agreed to was 7500 ton in a 24hr period, so yes we were hit with demurrage for running over our laycan time.**
- **SGS provided the draft survey, hold cleanliness inspection and sampling all firsts for us.**
- **Rain delays caused added stress**

Managing the cash flow

- **Managing the cash flow issues producing the pellets to the final discharge and payment from Helsingborg.**

Reflections 25 year on

- Was I **crazy** ? I didn't at time but knowing what I do now YES.
- Would you take this risk again?

What's changed in the past 25 years

- 500,000 in 1998 to almost 26,000,000 tpy 2022
- ISO standards and Sustainability Criteria
- Safety
 - Off-gassing
 - Fire & Explosion
 - Implementation of safety protocols



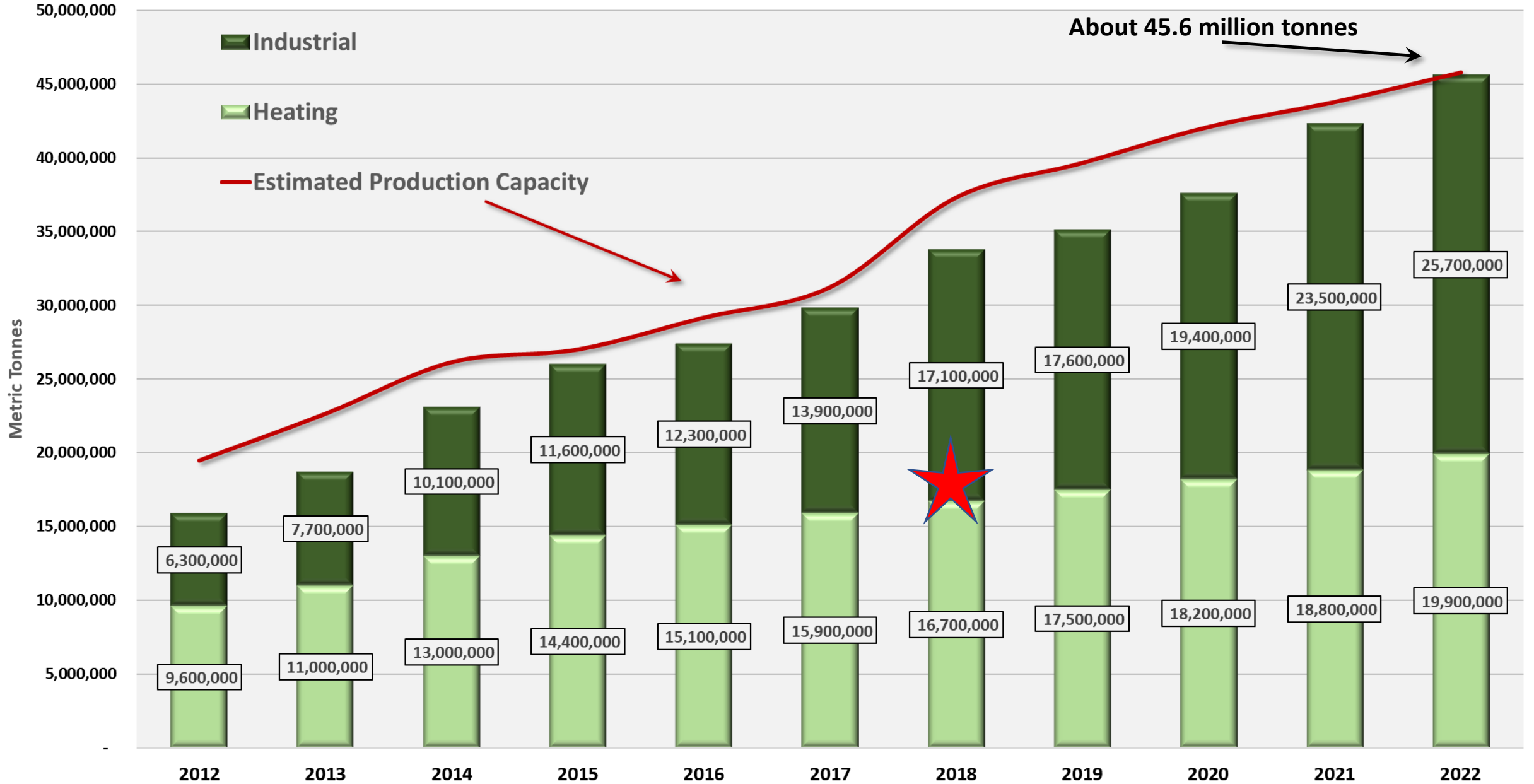
FutureMetrics LLC TM

FutureMetrics provides due diligence services, information and analysis, operations guidance, and strategic advice.

FutureMetrics combines decades of experience in the pellet sector with deep operational expertise, powerful sector focused financial modeling skills, and thought leading market awareness.

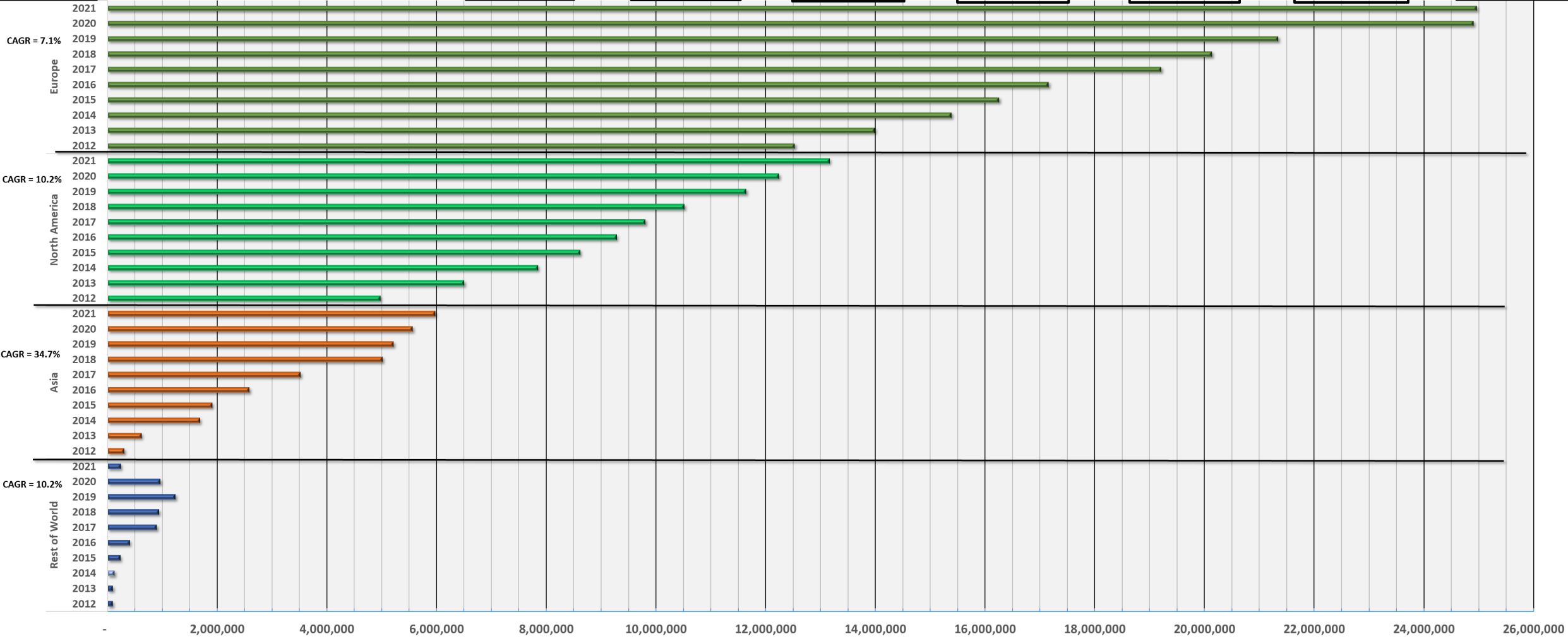
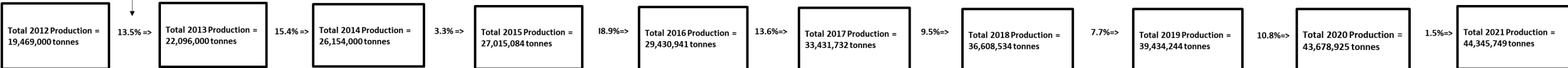
Mitigating climate change is the foundation of our mission

Global Wood Pellet Demand and Estimated Supply



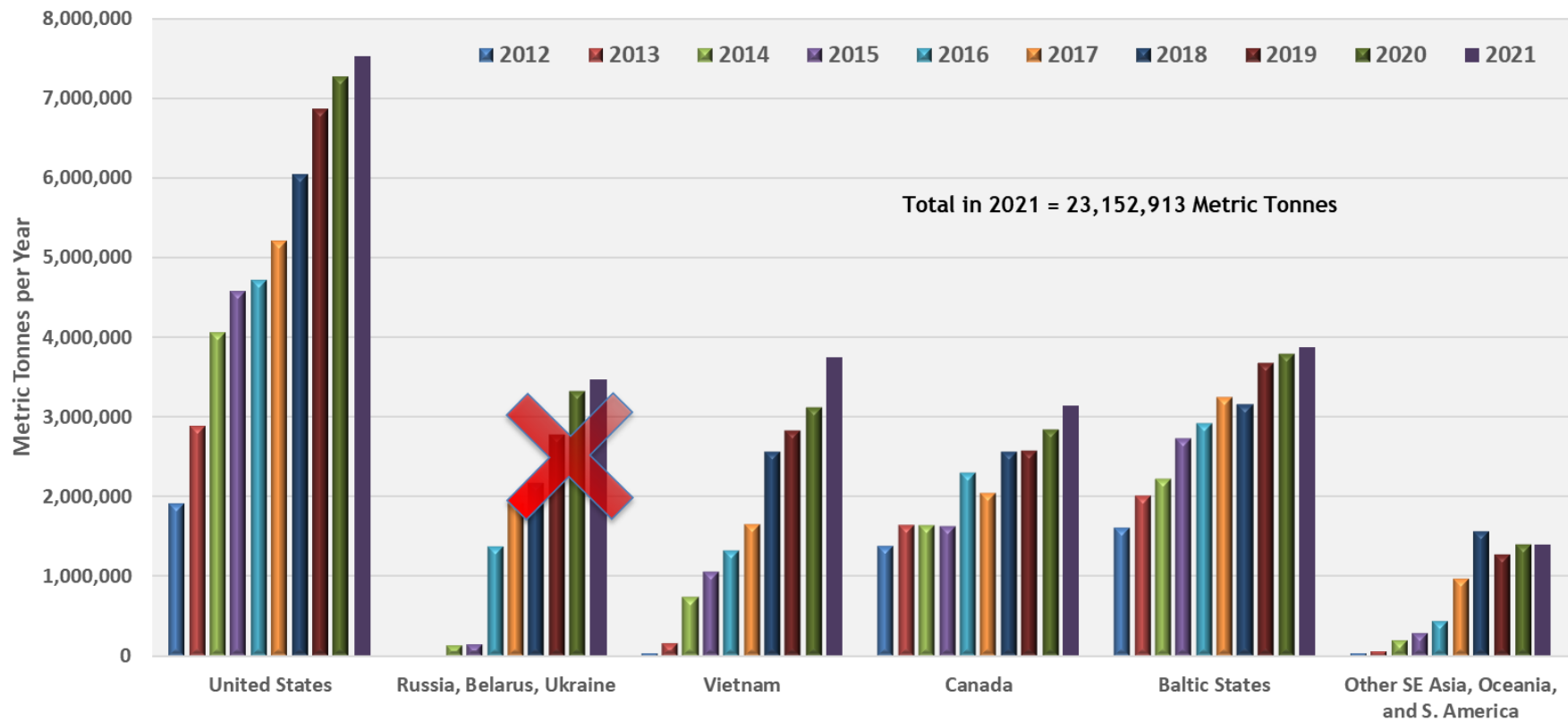
sources: International trade data, FAO data on production, BioEnergy Europe, January 2023; Analysis by FutureMetrics

Global Wood Pellet Production (both industrial and heating pellets in metric tonnes)



Source: Data from Food and Agriculture Organization of the United Nations, January 2023, Analysis by FutureMetrics

Major Pellet Exporting Regions



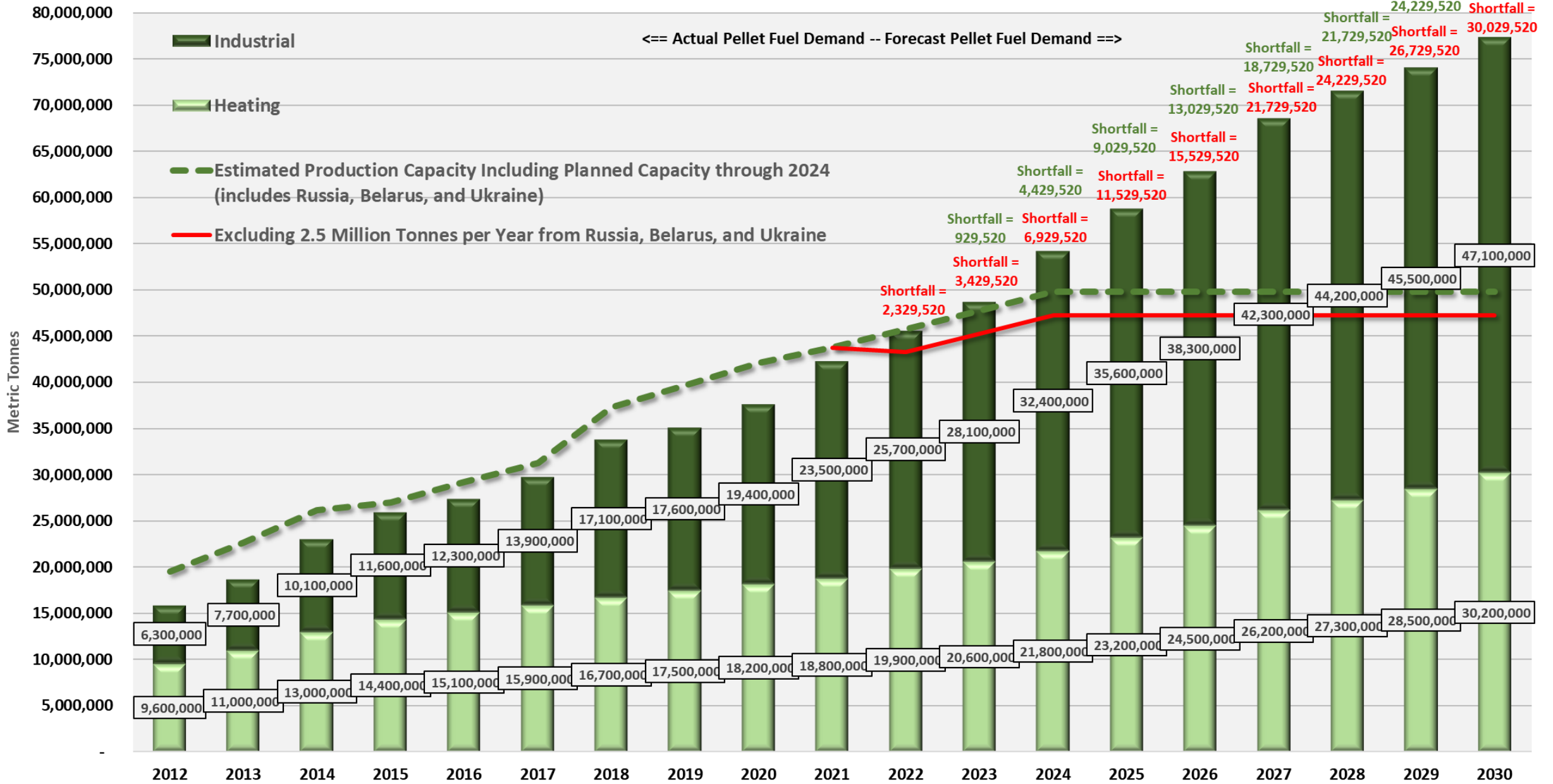
source: International trade data, January 2023; Analysis by FutureMetrics

Major Exporting Regions Annual Exports (metric tonnes)

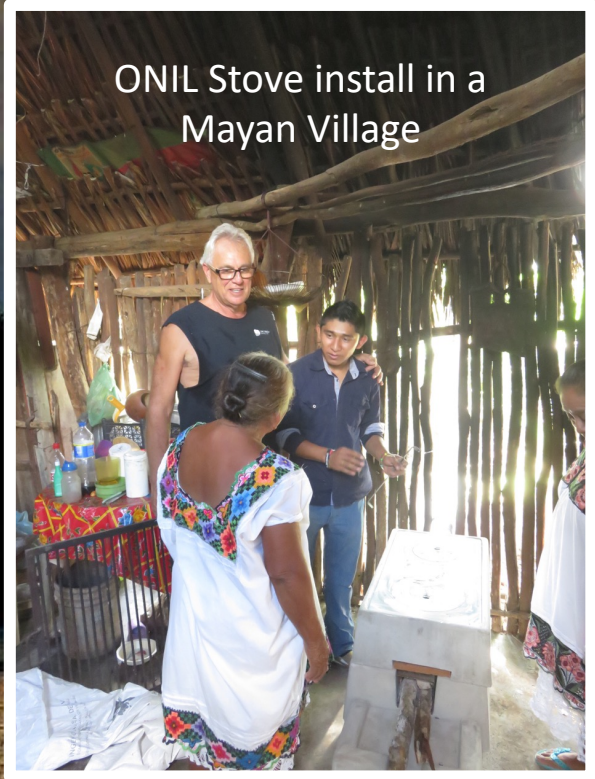
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	CAGR 2012 to 2021	% of Market in 2021
United States	1,898,126	2,882,521	4,055,732	4,575,473	4,709,746	5,197,589	6,039,432	6,858,419	7,256,858	7,522,518	14.8%	32.5%
Russia, Belarus, Ukraine	0	0	132,279	150,108	1,369,778	1,912,071	2,171,271	2,778,774	3,321,437	3,472,344	38.6%	15.0%
Vietnam	33,829	160,123	744,773	1,050,249	1,317,396	1,648,861	2,560,183	2,828,444	3,121,143	3,748,439	60.1%	16.2%
Canada	1,369,143	1,640,175	1,637,347	1,627,784	2,299,906	2,039,490	2,565,776	2,576,579	2,843,408	3,140,845	8.7%	13.6%
Baltic States	1,597,382	2,000,585	2,215,645	2,728,558	2,910,392	3,242,741	3,158,615	3,672,837	3,782,184	3,870,871	9.3%	16.7%
Other SE Asia, Oceania, and S. America	27,008	55,992	194,458	286,726	438,970	970,768	1,566,868	1,267,235	1,391,926	1,397,896	48.4%	6.0%
	4,925,488	6,739,396	8,980,234	10,418,897	13,046,189	15,011,519	18,062,145	19,982,288	21,716,957	23,152,913	16.7%	100.0%

source: International trade data, January 2023; Analysis by FutureMetrics

Global Pellet Demand with the Forecast Under Evolving Policy in the Industrial Sector



sources: International trade data, FAO data on production, BioEnergy Europe, January 2023; Analysis by FutureMetrics



THANK YOU