

# An Overview of the Wood Pellet Sector

With a focus on Canada

September 19, 2023

Presented at

The Wood Pellet Association of Canada's Annual Conference

By William Strauss



*FutureMetrics LLC* <sup>TM</sup>



# *FutureMetrics LLC* <sup>TM</sup>

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

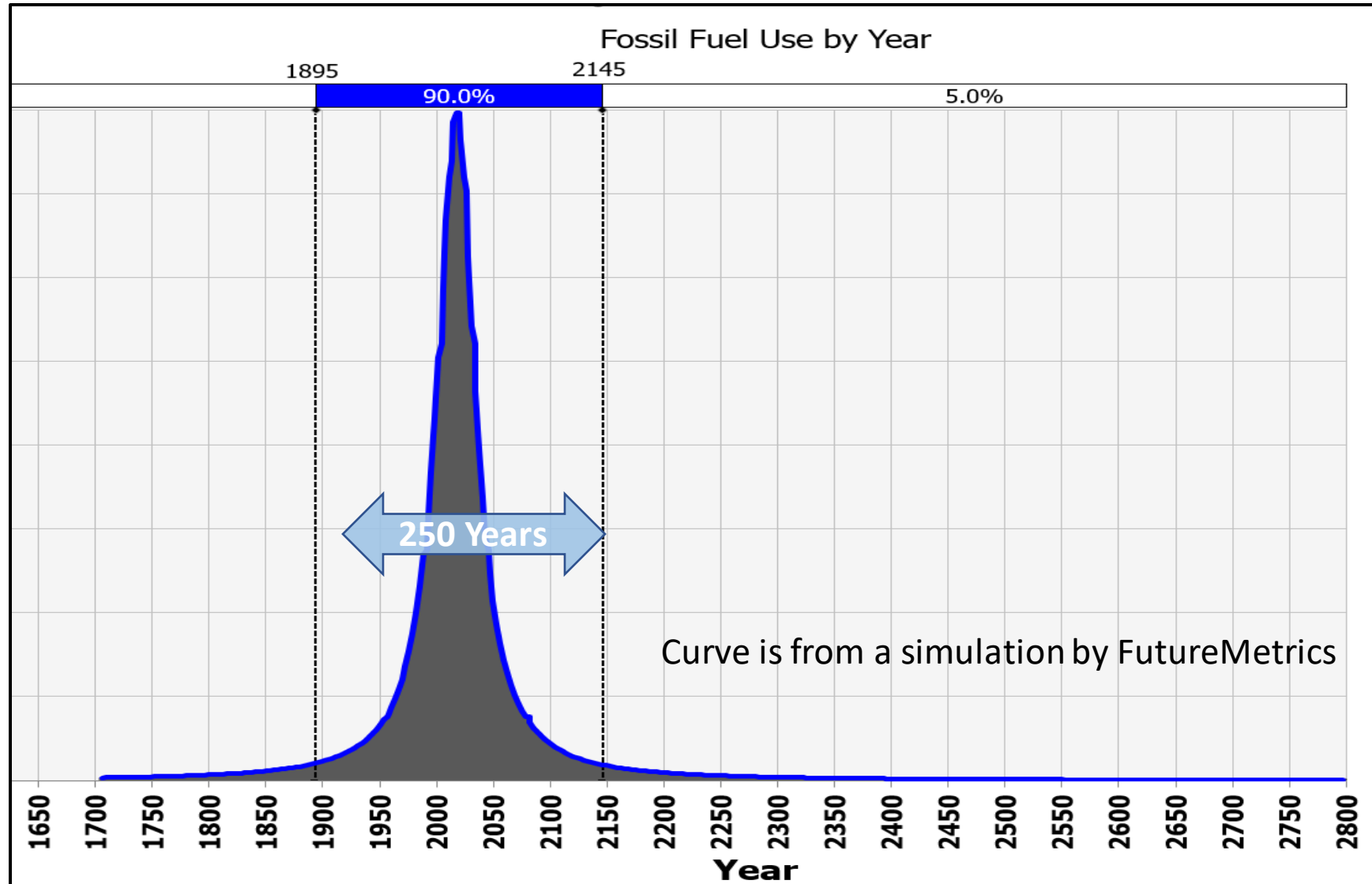
***FutureMetrics combines decades of experience in the pellet sector with deep operational expertise, powerful sector focused financial modeling skills, and thought leading market awareness.***

FutureMetrics - Consultants to Many of the World's Leading Companies with Interests in the Wood Pellet Fuel Sector



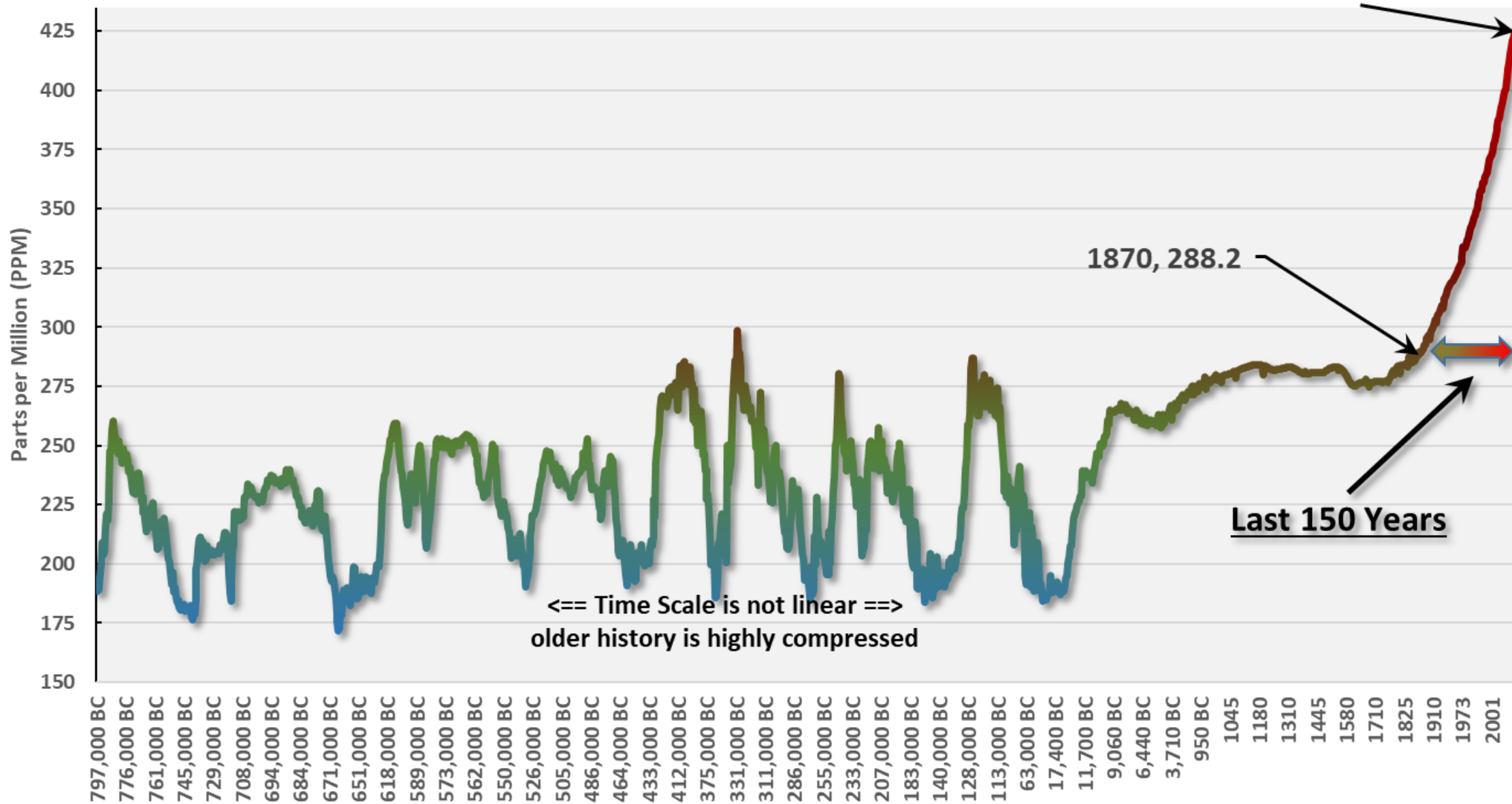
# Fossil Fuel Depletion and CO<sub>2</sub> Emissions are Linked.

*We will release most of the geologic carbon sequestered over hundreds of millions of years over a span of about 250 years.*



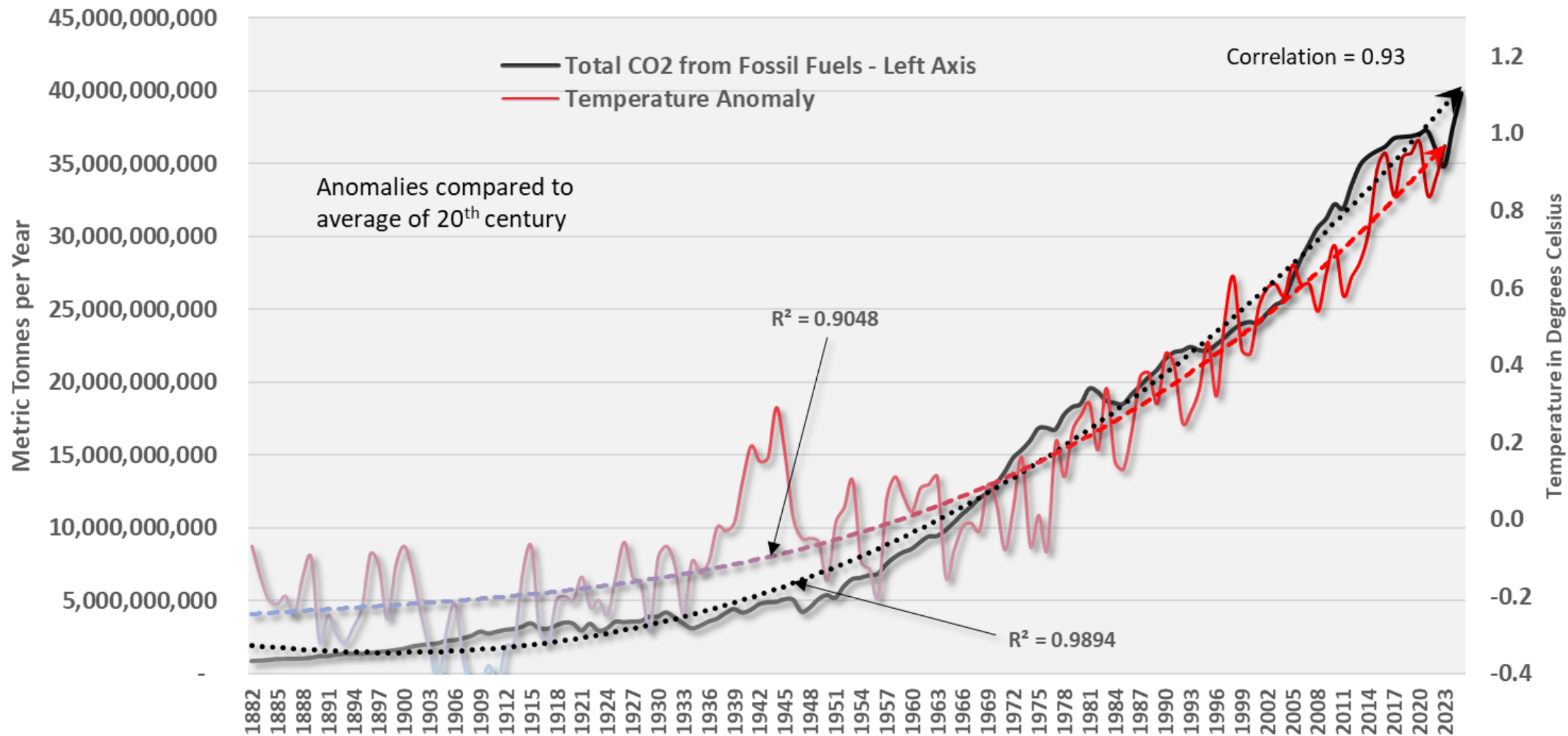
# Atmospheric CO<sub>2</sub> Concentration - 800,000 year history

New Record High on April 28 2023, 425.01



Source: EPA's Climate Change Indicators in the United States: [www.epa.gov/climate-indicators](http://www.epa.gov/climate-indicators); NOAA for recent data; June 2023, analysis by FutureMetrics

# CO<sub>2</sub> Released from Fossil Fuel Combustion and Global Land and Sea Temperature Anomalies



source: National Fossil-Fuel CO<sub>2</sub> Emissions, Carbon Dioxide Information Analysis Center, World Bank, Temperature Anomalies from NOAA, June 2023; 2023 estimates and analysis by FutureMetrics

***These are both exponentially increasing!***

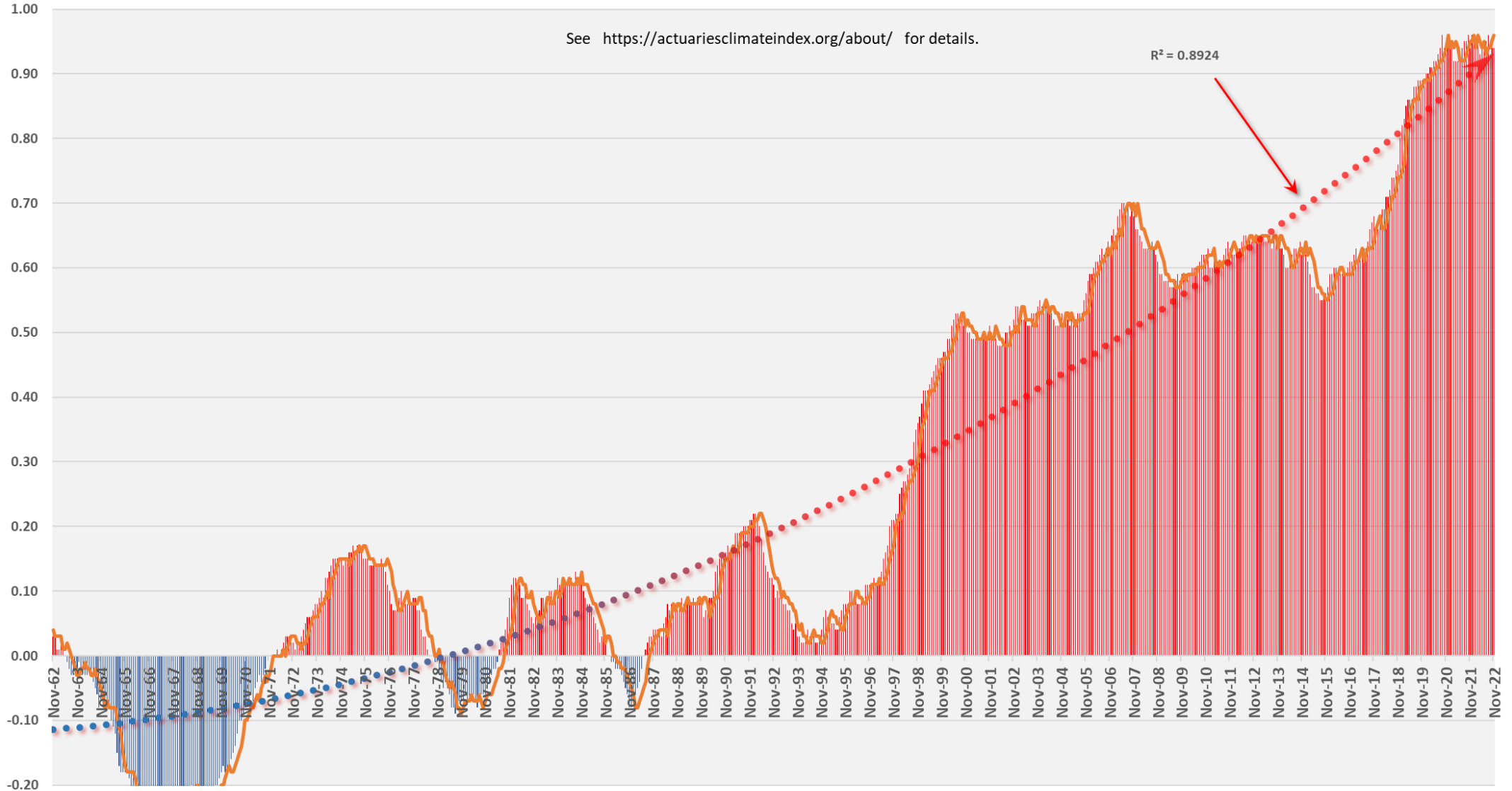
# The consequences are not only Environmental and Ecological but are also Economic!

## Actuaries' Climate Risk Index - Monthly 1962 to Most Recent Data

Index is combined result of the average of [High Temperatures minus Low Temperatures plus Rainfall Data plus Extreme Winds plus Water Temperatures plus Sealevel]

See <https://actuariesclimateindex.org/about/> for details.

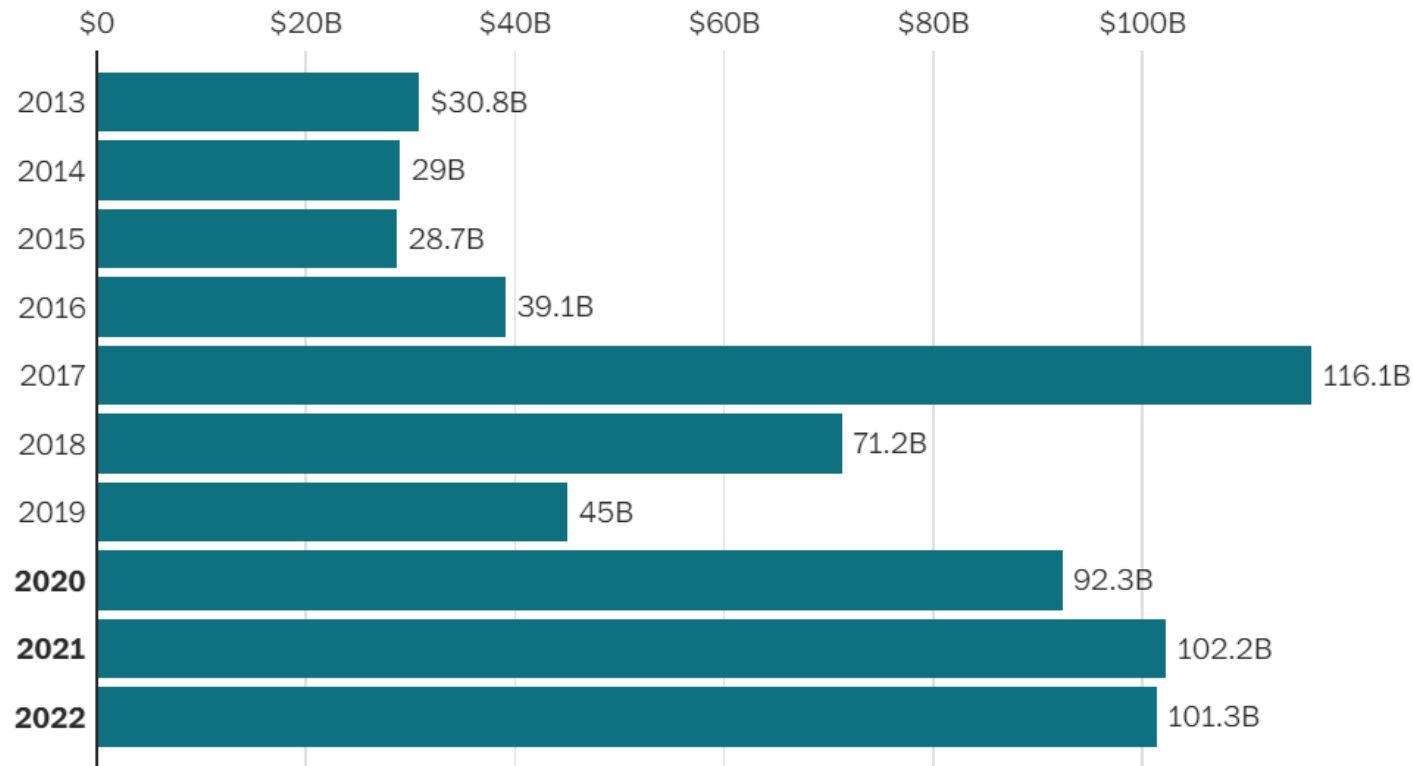
$R^2 = 0.8924$



# “Home insurers cut natural disasters from policies as climate risks grow”

## U.S. insured losses from natural disasters

U.S. insurers have paid out **\$295.8 billion** in natural disaster losses from 2020 to 2022, a record for a three-year period.



Source: [Aon](#)

JACOB BOGAGE / THE WASHINGTON POST

That trend is too costly, insurers contend, and necessitates rewriting policies or eliminating coverages in growing geographic areas.

Source: Washington Post, Sept. 3, 2023



# Part of the Decarbonization Solution

## Sustainably Produced Carbon Beneficial Solid Fuel



Two major sub-sectors in the wood pellet markets:

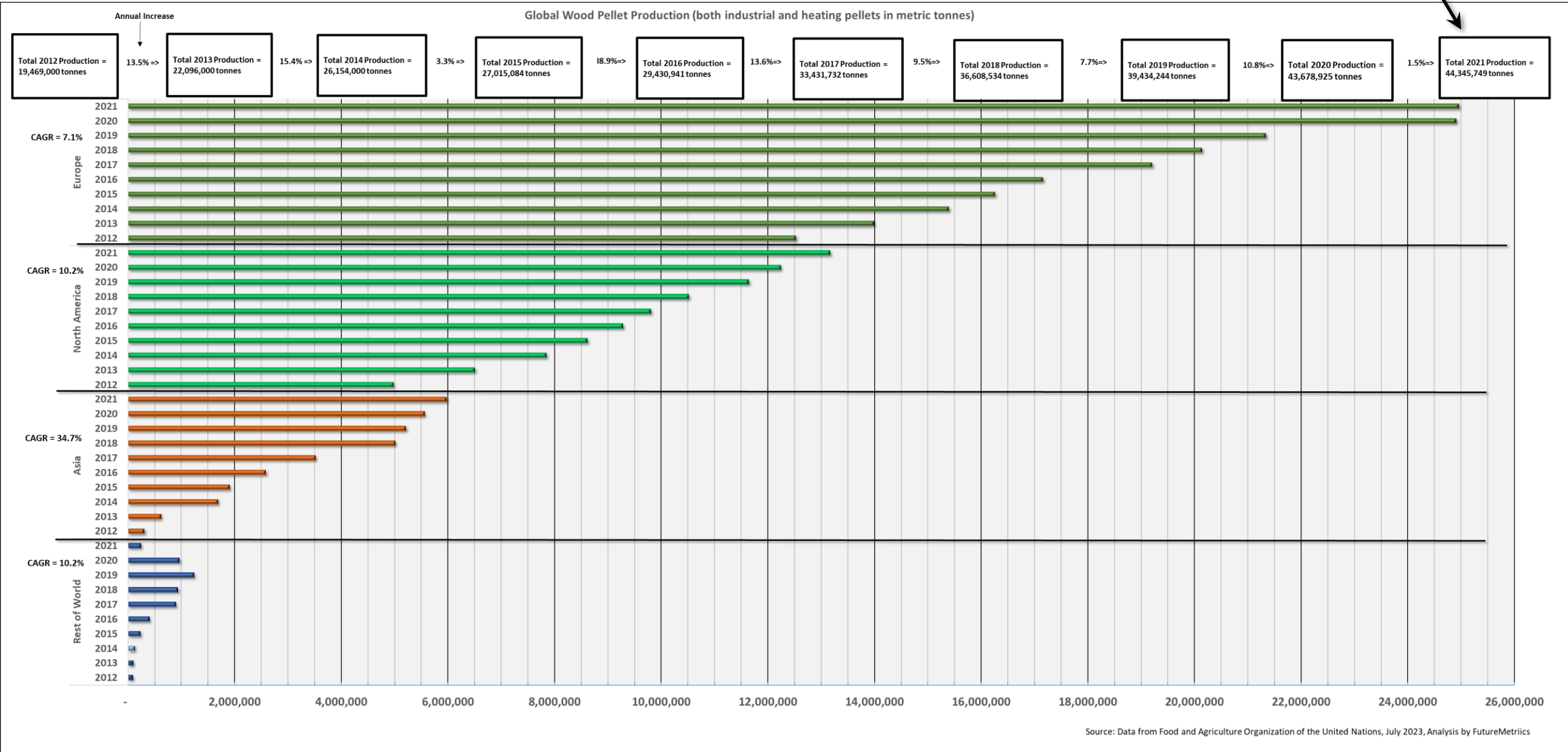
- Heating (premium) pellets
- Industrial pellets (used to replace coal in larger scale heat and power generation)

# Total global production of both heating (premium) and industrial wood pellets

44.35 million metric tonnes in 2021

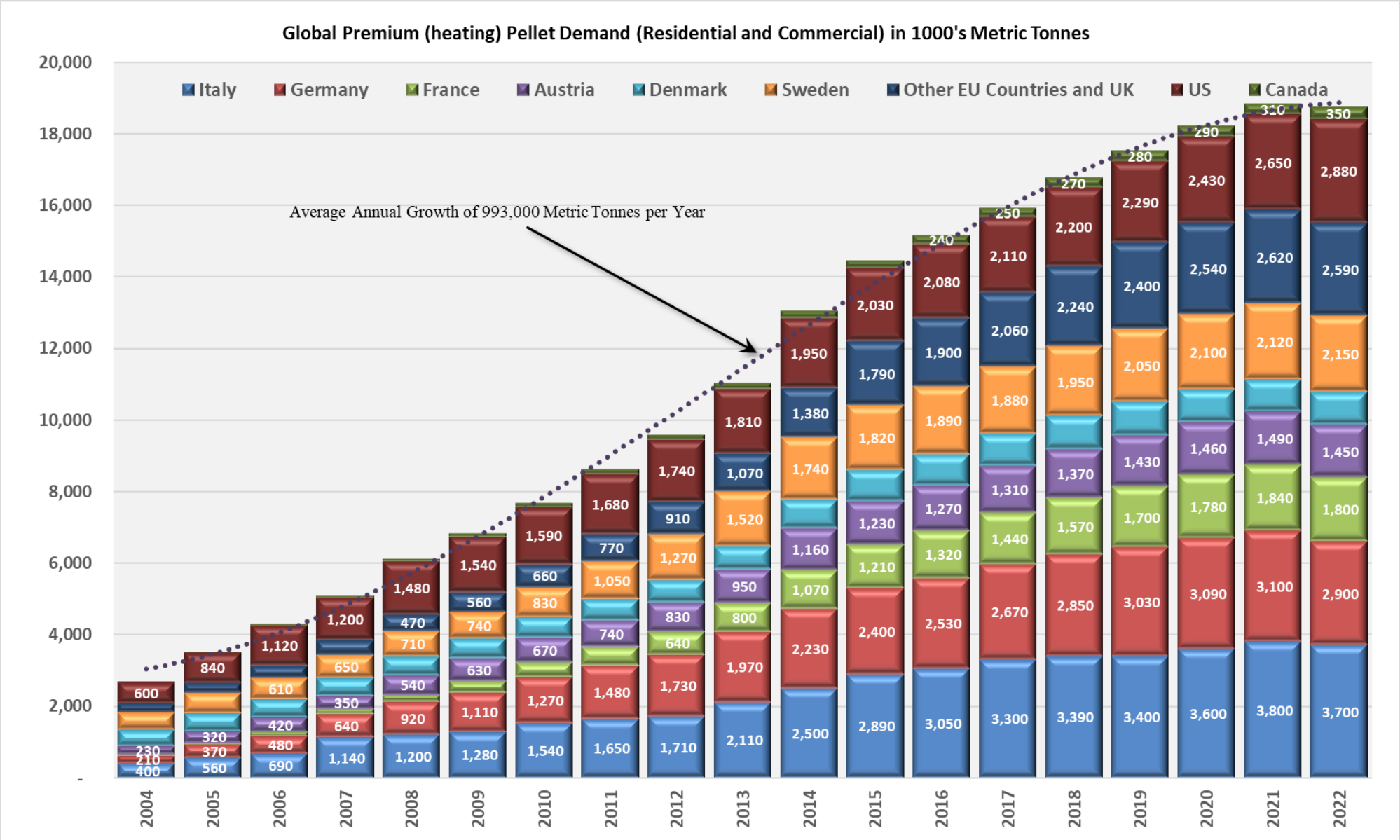


Global Wood Pellet Production (both industrial and heating pellets in metric tonnes)



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

# Canada's use of premium (heating) pellets is surprisingly low considering the climate and the abundance of forest and mill residuals.

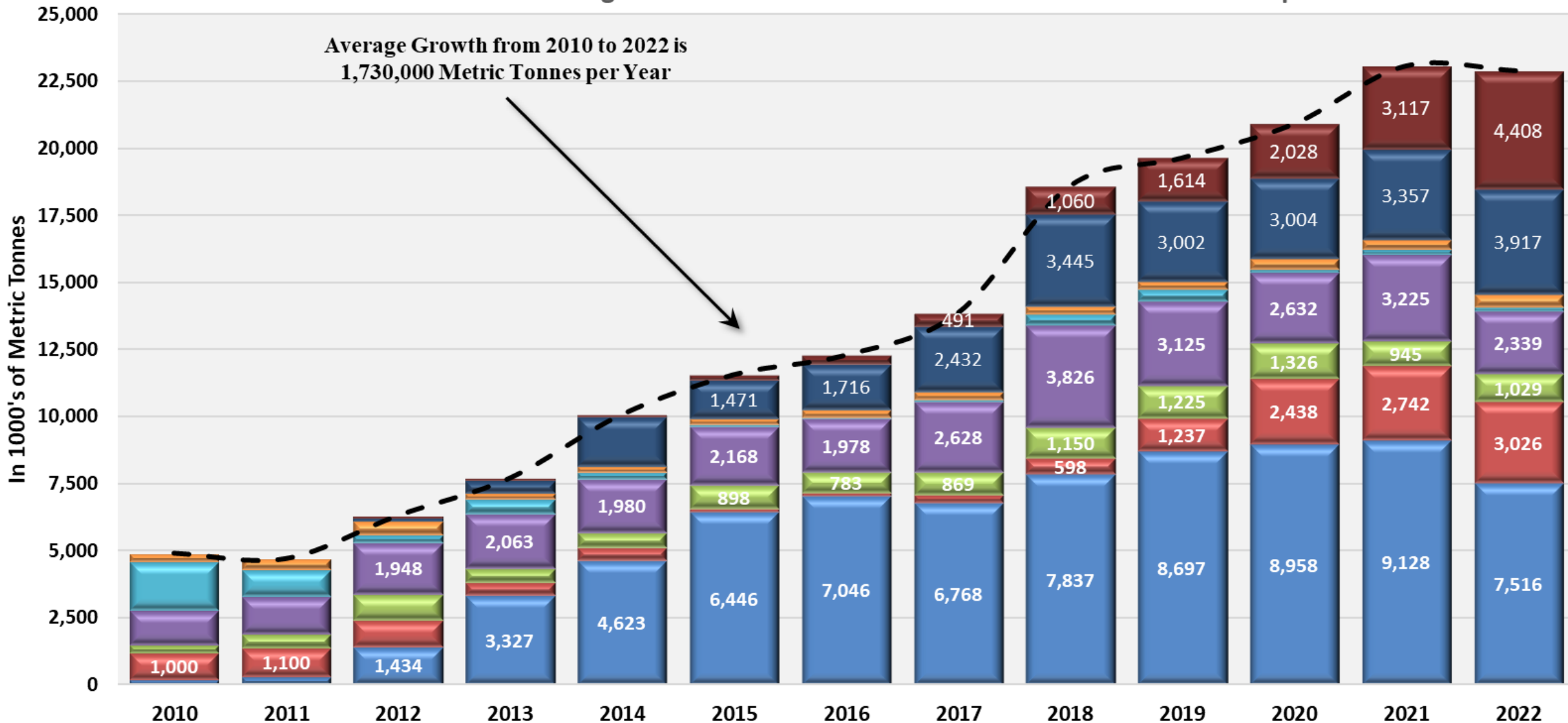


sources: European Pellet Council, HPBA US and CA stove data, Analysis and Forecast by FutureMetrics

## Industrial Wood Pellet Sector Actual Net Imports 2010 to 2022

■ UK 
 ■ Netherlands 
 ■ Belgium 
 ■ Denmark 
 ■ Sweden 
 ■ Other 
 ■ S. Korea 
 ■ Japan

Average Growth from 2010 to 2022 is  
 1,730,000 Metric Tonnes per Year



source: international trade data; analysis by FutureMetrics

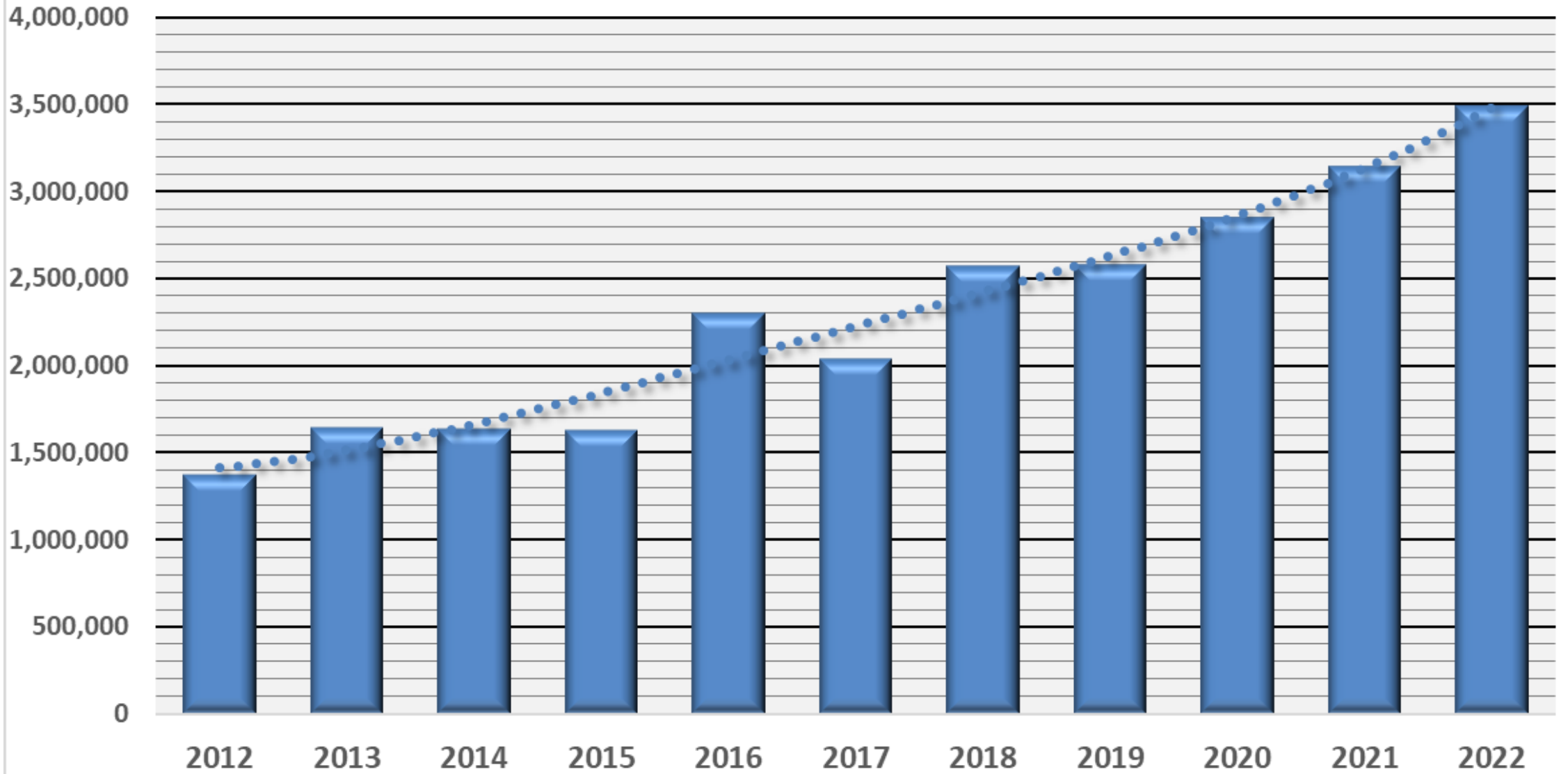
Global Wood Pellet Trade - Negative (red) Numbers in Parenthesis are Net Exporters - Metric Tonnes

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Europe											
Austria	(204,139)	(97,342)	(141,427)	(181,501)	(225,123)	(253,689)	(401,119)	(478,489)	(439,947)	(347,885)	(62,571)
Belgium	930,821	501,968	558,869	897,510	783,257	869,188	825,560	888,534	828,046	582,515	1,546,880
Bulgaria	(15,511)	(62,275)	(134,657)	(108,970)	(66,549)	(117,659)	(112,072)	(100,402)	(76,144)	34,955	199,701
Croatia	(137,424)	(167,975)	(153,549)	(186,832)	(213,744)	(243,286)	(226,570)	(253,506)	(282,422)	(100,272)	(302,496)
Czech Republic	(121,477)	(108,360)	(122,672)	(203,758)	(254,248)	(260,749)	(298,423)	(271,513)	(305,846)	(352,898)	(316,401)
Denmark	1,948,023	2,063,269	1,979,713	2,167,707	1,977,716	2,627,827	3,137,433	2,098,750	1,171,628	1,567,848	3,606,906
Estonia	(415,752)	(556,585)	(579,166)	(865,974)	(932,180)	(1,242,033)	(1,093,209)	(1,108,696)	(1,056,053)	(1,204,224)	(1,357,266)
Finland	(32,914)	(18,102)	(10,002)	(407)	15,501	53,689	51,287	65,908	105,267	169,559	141,011
France	(75,721)	(62,731)	43,861	(61,909)	52,692	71,386	83,348	257,741	314,874	481,974	603,800
Germany	(501,311)	(173,606)	(263,421)	(270,311)	53,585	(69,076)	(188,940)	(340,370)	(417,710)	(335,452)	45,262
Greece	17,987	16,060	20,326	25,703	31,431	30,654	42,138	37,062	40,279	26,116	44,159
Hungary	(13,938)	(6,872)	(4,715)	(2,871)	6,041	9,929	9,323	8,679	10,727	9,381	1,048
Ireland	23,455	50,872	24,786	20,886	55,577	(5,403)	6,965	46,919	35,100	18,547	5,440
Italy	1,191,142	1,749,602	1,947,884	1,630,741	1,650,089	1,771,016	2,229,680	1,836,473	1,774,465	1,503,916	1,604,155
Latvia	(867,944)	(1,014,601)	(1,188,731)	(1,420,984)	(1,464,783)	(1,378,968)	(1,342,895)	(1,669,700)	(1,697,032)	(656,966)	(1,327,541)
Lithuania	(225,406)	(263,450)	(225,756)	(228,338)	(221,772)	(287,036)	(277,397)	(358,231)	(332,067)	(356,289)	(334,262)
Netherlands	873,551	377,706	213,089	215	(1,612)	72,022	3,090	859,933	2,576,176	2,435,894	2,849,216
Poland	83,778	(97,938)	(132,626)	(150,474)	(211,177)	(251,084)	(301,289)	(298,842)	(352,717)	(174,843)	(106,222)
Portugal	(551,276)	(738,749)	(687,560)	(632,011)	(436,150)	(457,692)	(516,951)	(712,996)	(598,894)	(430,795)	(521,051)
Romania	(275,577)	(451,271)	(410,125)	(315,202)	(247,276)	(150,694)	(99,579)	(196,785)	(342,717)	(40,820)	(327,156)
Slovakia	(5,703)	(23,871)	(40,391)	(33,433)	(39,171)	(56,656)	(61,155)	(46,147)	(112,626)	(12,880)	(242,733)
Slovenia	8,638	50,791	45,908	29,085	73,917	2,499	41,261	26,836	68,553	63,215	(40,021)
Spain	(32,135)	(6,959)	(1,259)	(3,761)	(59,125)	(75,916)	(68,497)	(9,126)	(34,151)	(43,999)	(140,680)
Sweden	297,914	550,162	269,319	101,830	39,661	69,300	238,621	283,751	(18,183)	(32,594)	(108,199)
UK	1,434,116	3,326,860	4,622,988	6,446,421	7,045,525	6,767,993	7,793,754	8,631,802	9,043,171	9,128,871	7,489,870
Cyprus	141	433	905	3,853	2,130	3,336	1,857	3,777	5,500	2,650	22,463
Luxembourg	(2,996)	34	1,918	(1,380)	(25,281)	(21,367)	(3,517)	8,937	(23,639)	(15,207)	(2,500)
Malta	154	113	291	394	262	369	395	668	453	330	655
Norway	(5,811)	29,138	21,527	13,647	18,319	(30,305)	9,397	63,868	(14,743)	(6,505)	(10,693)
Switzerland	25,106				66,848	90,879	87,891	75,201	77,369	79,381	109,146
North America											
Canada	(1,284,707)	(1,615,638)	(1,607,239)	(1,597,847)	(2,252,201)	(2,020,000)	(2,545,997)	(2,549,285)	(2,812,886)	(3,110,903)	(3,425,679)
US	(1,811,390)	(2,730,078)	(3,835,747)	(4,368,301)	(4,906,460)	(4,986,031)	(5,818,345)	(6,646,805)	(7,051,899)	(7,274,533)	(8,801,843)
Northeast Asia											
Japan	68,519	79,052	92,539	232,060	352,851	505,996	1,059,230	1,613,785	2,014,881	2,515,144	4,406,056
South Korea	122,427	484,668	1,849,639	1,469,184	1,716,346	2,432,173	3,450,008	3,002,312	3,005,429	3,406,646	3,917,200
Taiwan				17,996	21,732	20,577	17,473	21,270	14,713	9,535	2,697
China				(49,318)	37,640	10,451	(4,794)	(9,681)	(4,603)	(3,404)	(8,254)
Southeast Asia											
Thailand	4,780	(17,561)	(75,011)	(24,414)	(20,611)	(103,894)	(268,692)	(155,417)	(52,353)	(12,541)	(122,202)
Indonesia	(12,110)	(37,080)	(75,879)	(64,435)	(84,714)	(135,294)	(276,399)	(242,504)	(259,586)	(366,286)	(508,169)
Malaysia				(147,982)	(293,484)	(524,651)	(697,932)	(608,414)	(549,678)	(439,483)	(787,814)
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)	(3,567,910)	(4,595,364)
South America											
Brazil	299	966	(6,208)	(47,037)	(34,937)	(107,506)	(224,912)	(216,704)	(359,556)	(363,368)	(482,137)
Oceania											
Australia	(13,941)	(399)	(612)	1,110	1,018	(67,774)	(70,080)	(15,446)	(100,944)	(90,291)	(59,141)
Former Soviet Union											
Russia					(1,070,290)	(1,433,650)	(1,510,926)	(1,948,702)	(2,322,714)	(2,240,310)	(578,899)
Belarus					(132,180)	(203,478)	(255,388)	(366,693)	(528,126)	(518,647)	(138,602)
Ukraine			(132,279)	(144,062)	(163,779)	(268,777)	(396,650)	(451,025)	(464,710)	(335,075)	(361,608)

Most of Canada's pellet production is exported into the industrial markets

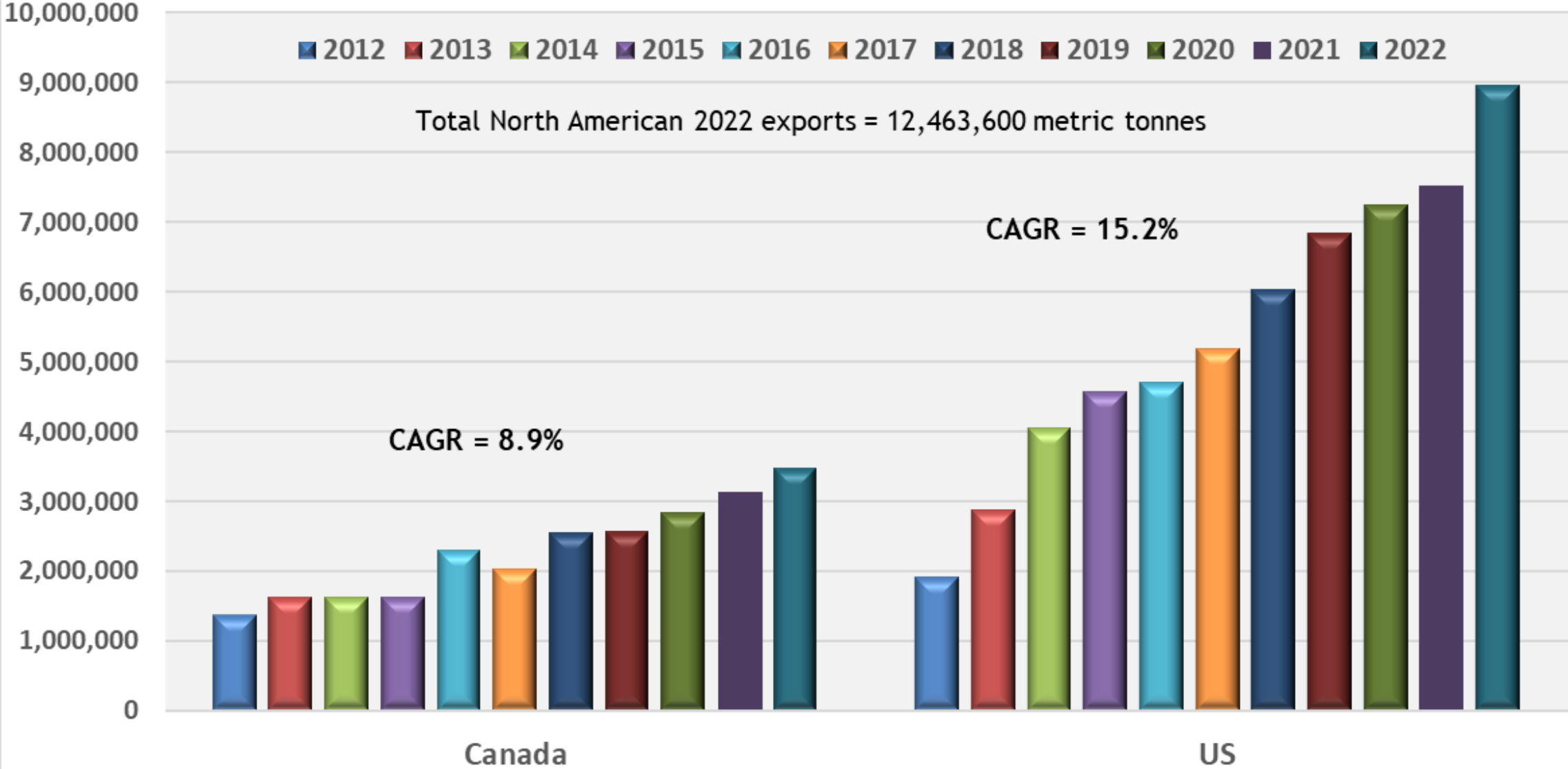


# Canada Pellet Exports (metric tonnes)



source: International Trade Data; Analysis by FutureMetrics

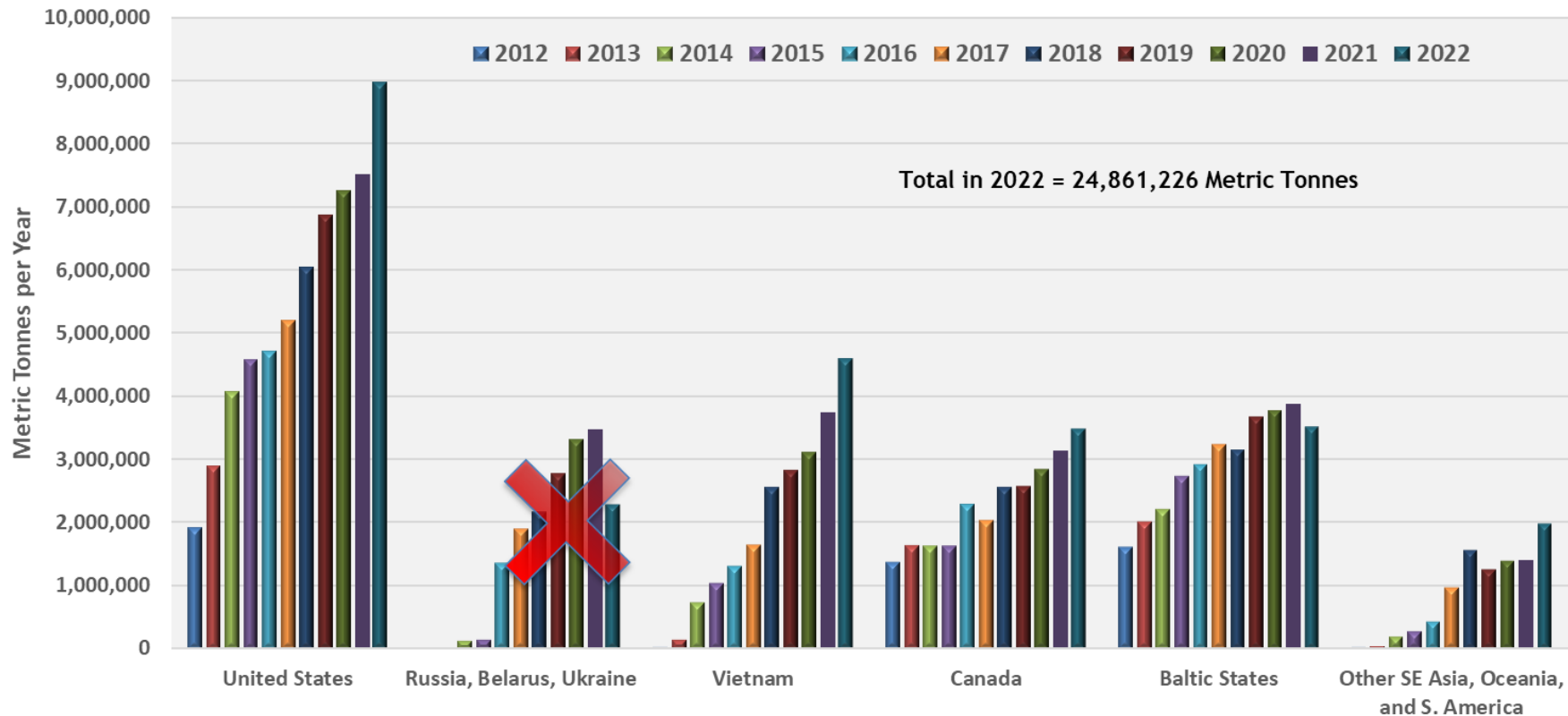
# North America Pellet Exports (metric tonnes)



source: International Trade Data; Analysis by FutureMetrics



## Major Pellet Exporting Regions



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

## Major Exporting Regions Annual Exports (metric tonnes)

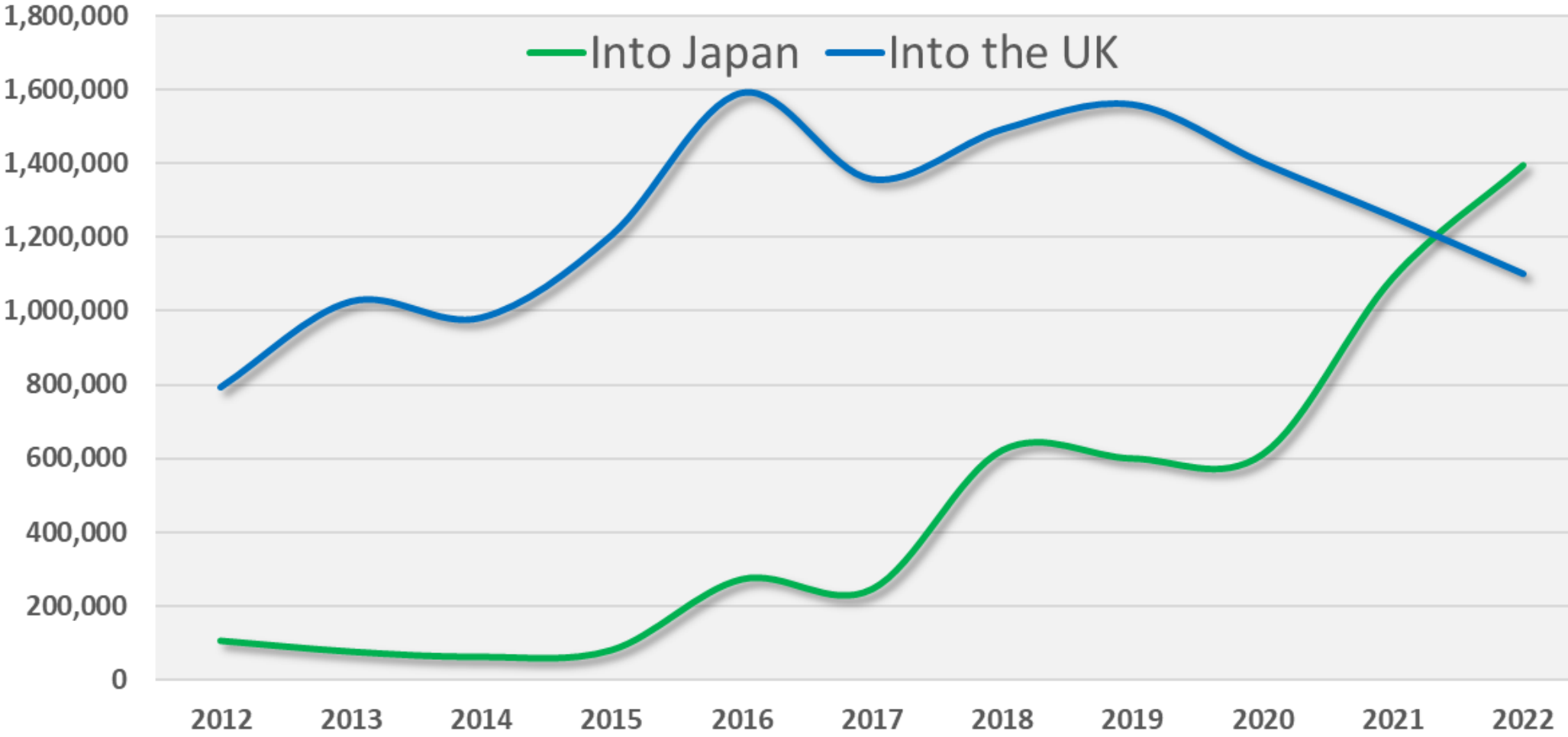
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	CAGR 2012 to 2022	% of Market in 2021	% of Market in 2022
United States	1,898,126	2,882,521	4,055,732	4,575,473	4,709,746	5,197,589	6,039,432	6,858,419	7,256,858	7,522,518	8,976,928	15.2%	32.5%	36.1%
Russia, Belarus, Ukraine	0	0	132,279	150,108	1,369,778	1,912,071	2,171,271	2,778,774	3,321,437	3,472,344	2,290,172	29.6%	15.0%	9.2%
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	4,595,364	56.3%	16.2%	18.5%
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	3,486,645	8.9%	13.6%	14.0%
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	3,530,726	7.5%	16.7%	14.2%
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	1,981,390	47.8%	6.0%	8.0%
<b>Total</b>	<b>4,925,488</b>	<b>6,739,396</b>	<b>8,980,234</b>	<b>10,418,897</b>	<b>13,046,189</b>	<b>15,011,519</b>	<b>18,062,145</b>	<b>19,982,288</b>	<b>21,716,957</b>	<b>23,152,913</b>	<b>24,861,226</b>	<b>15.9%</b>		

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

# Canada's Two Major Wood Pellet Destinations are the UK and Japan

## Canadian Wood Pellet Exports into the UK and Japan

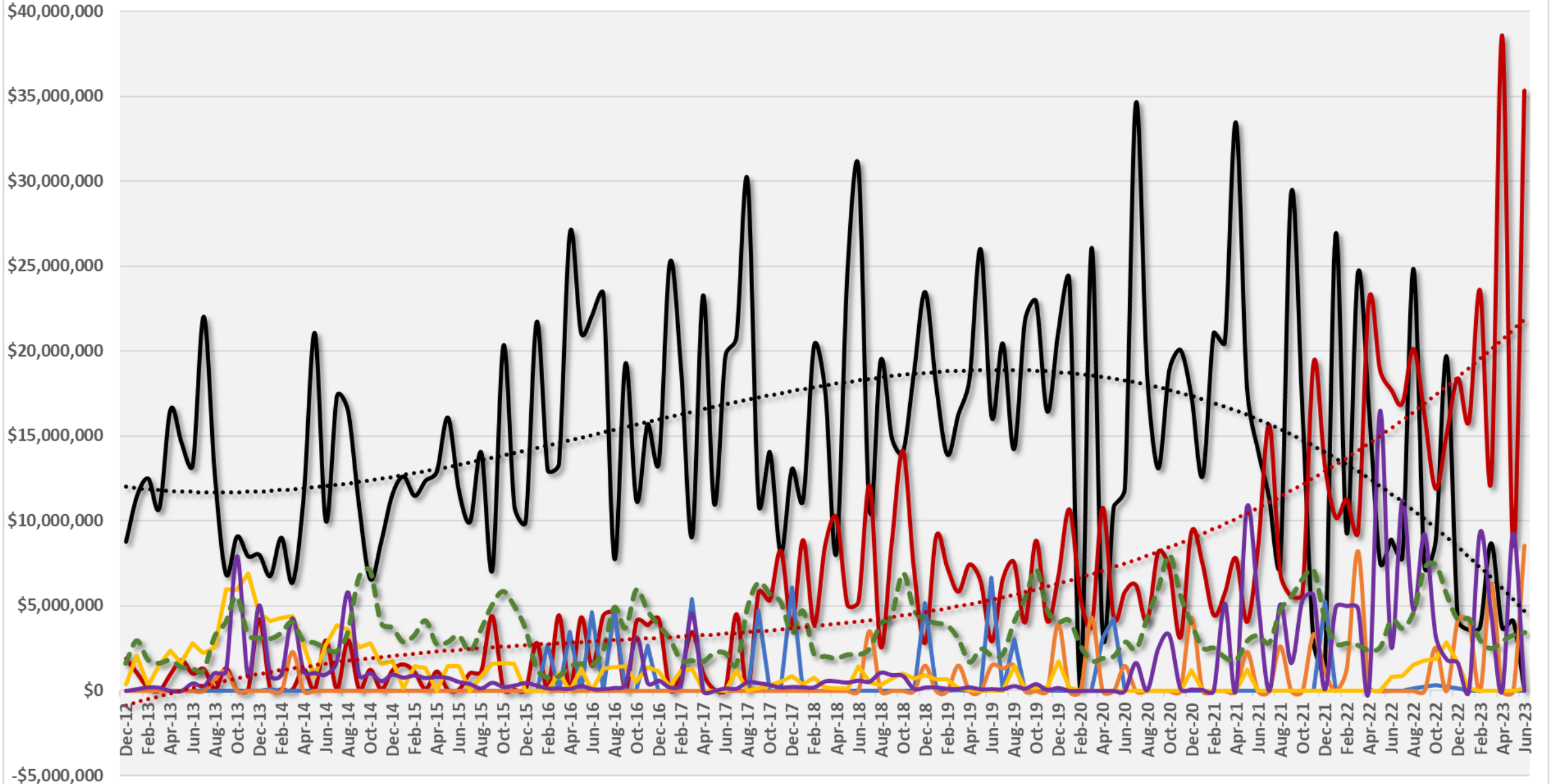
(metric tonnes)



source: International Trade Data, September 2023; Analysis by

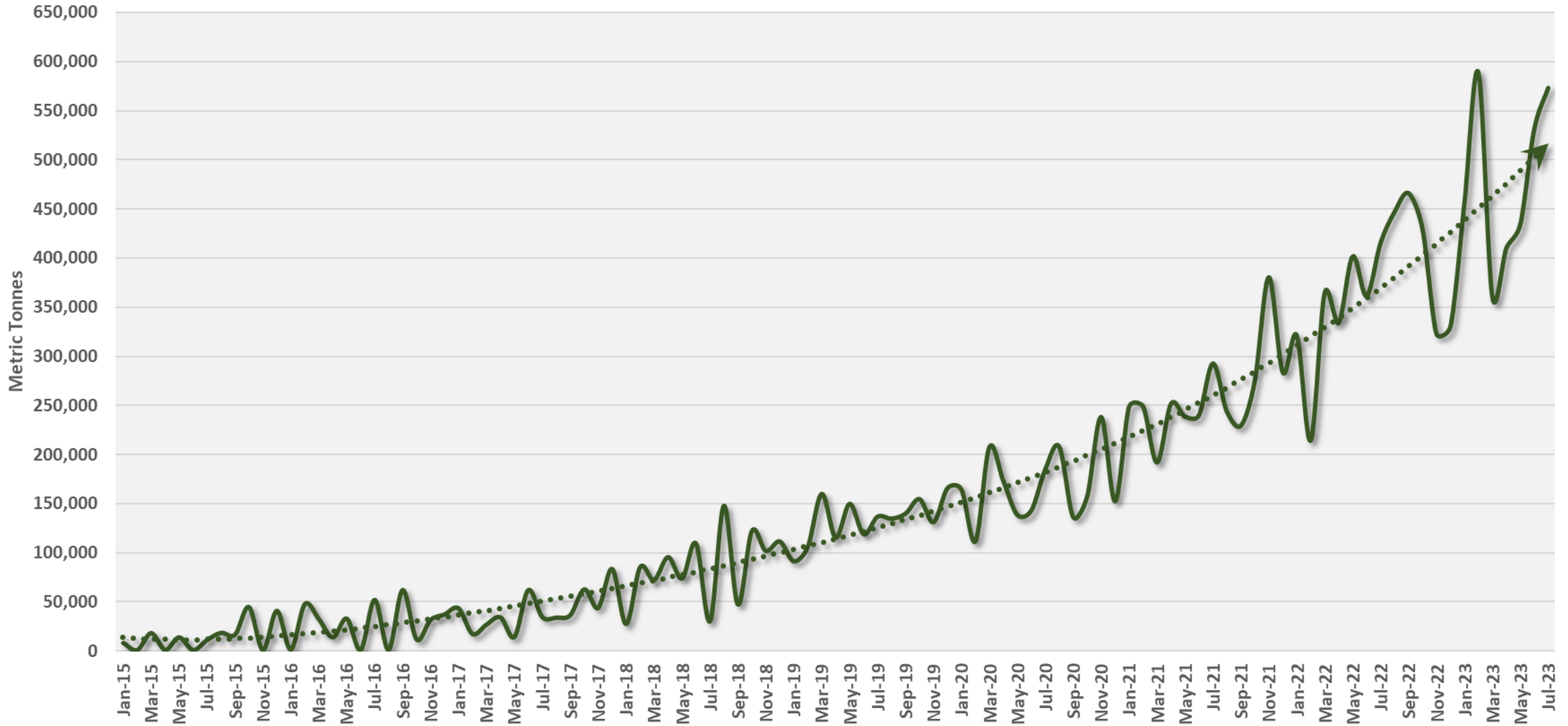
# Value of Monthly Wood Pellet Exports from Canada (US\$ per metric tonne)

United Kingdom Japan Belgium Denmark Italy South Korea United States



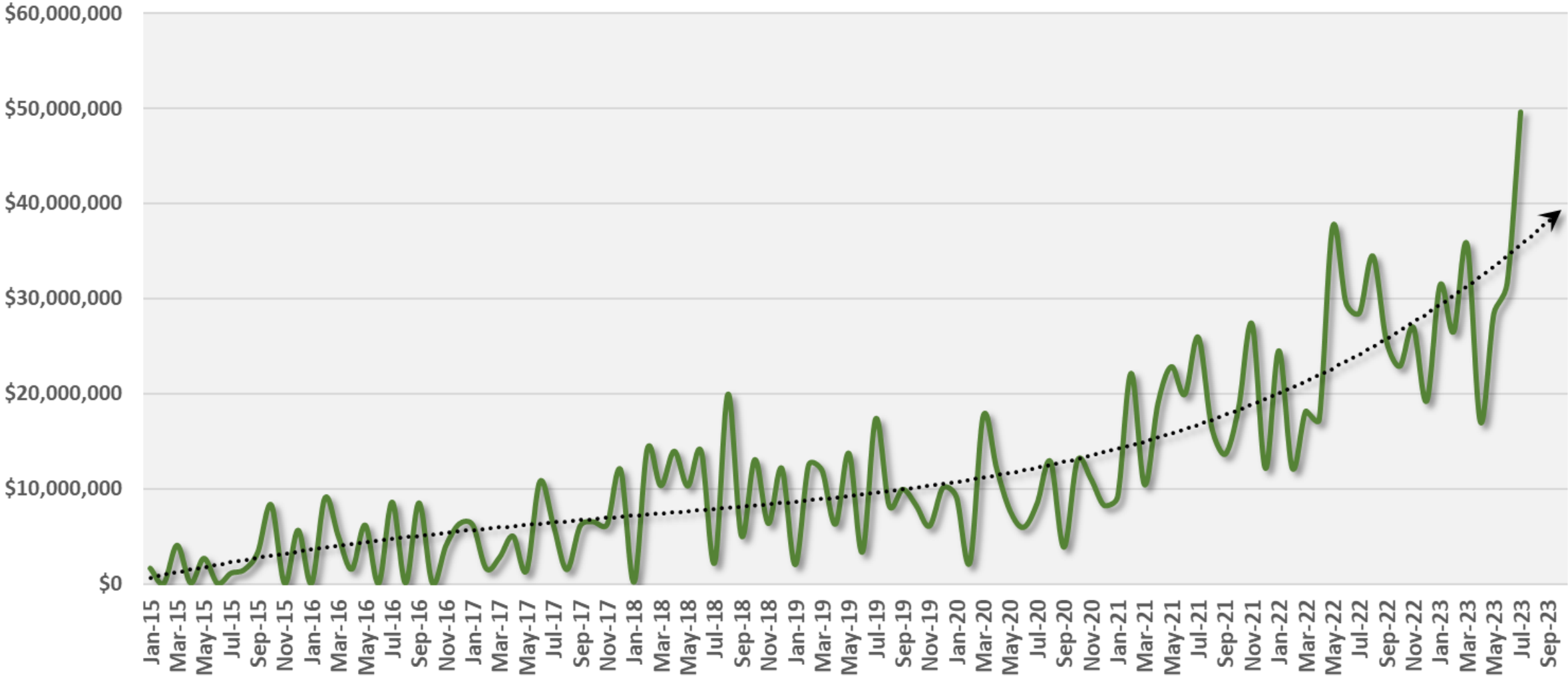
source: International Trade Data; Analysis by FutureMetrics

# Total Japan Wood Pellet Imports by Month



source: International Trade Data, September 2023; Analysis by FutureMetrics

# Canadian Wood Pellet Imports into Japan - Value in US\$ at FX each Month

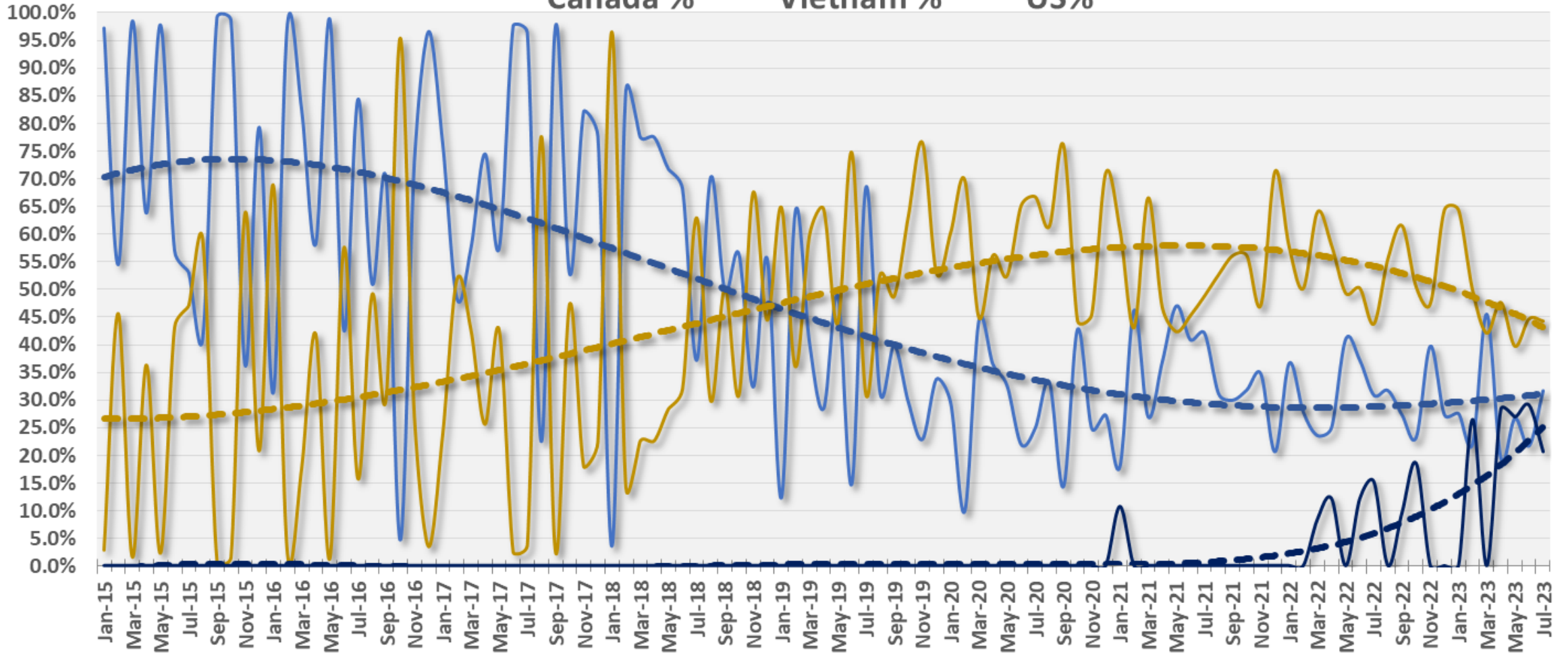


source: International Trade Data, September 2023; Analysis by FutureMetrics

# Market Share in the Japanese Market

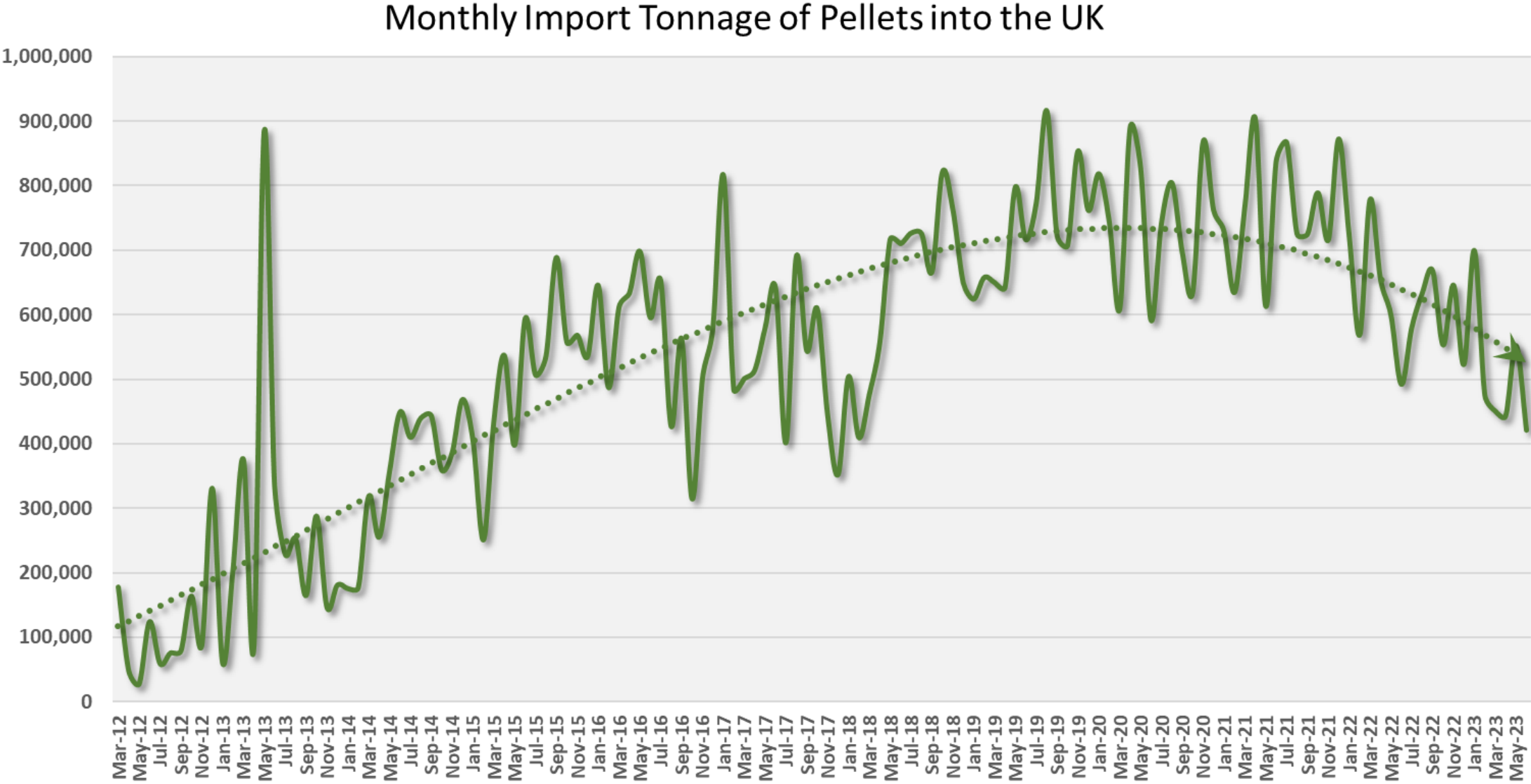
(other low volume countries not shown but included in share calculation)

— Canada % — Vietnam % — US%



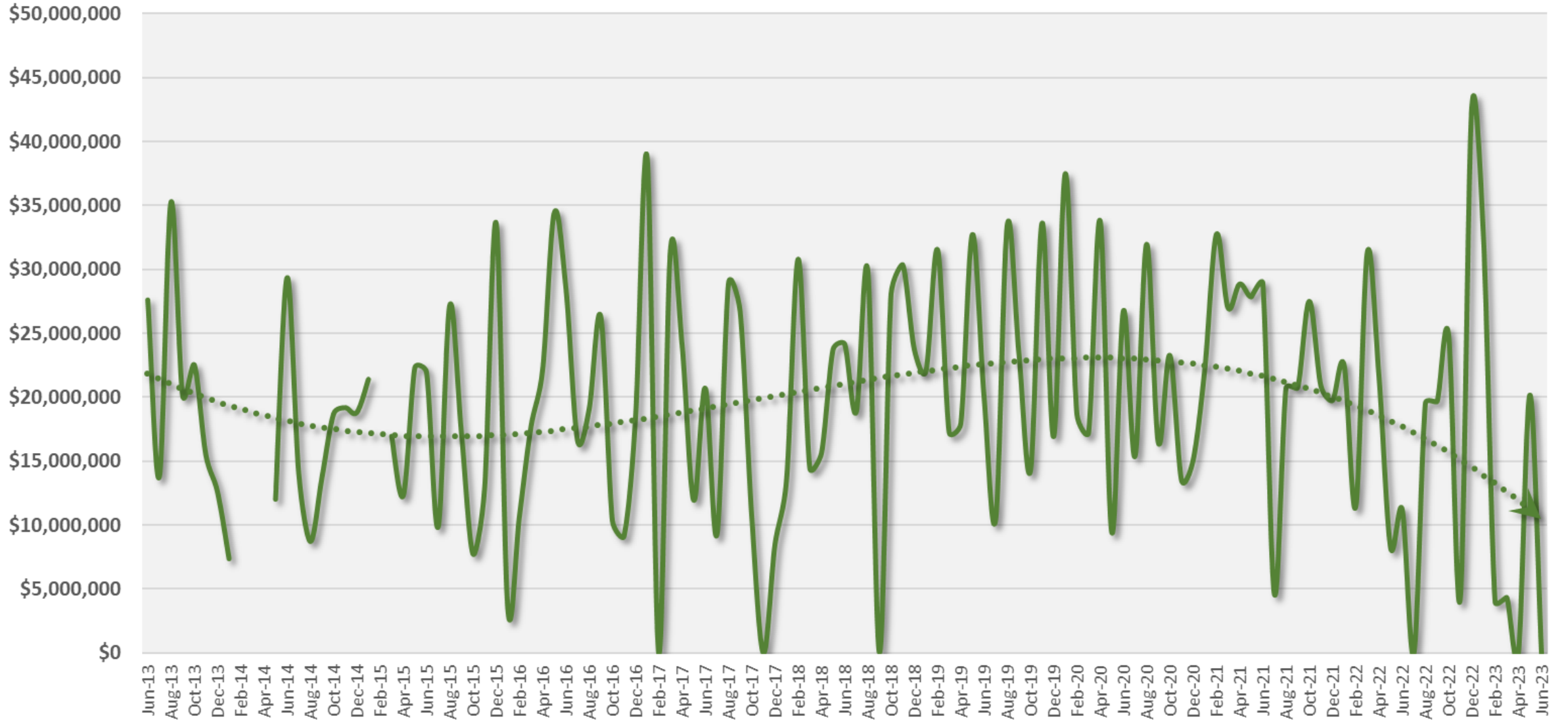
source: International Trade Data, September 2023; Analysis by FutureMetrics

# The UK has been a major buyer of Canadian pellets



source: International Trade Data, September 2023; Analysis by FutureMetrics

# Monthly Import Value of Canadian Pellets into the UK - in US\$

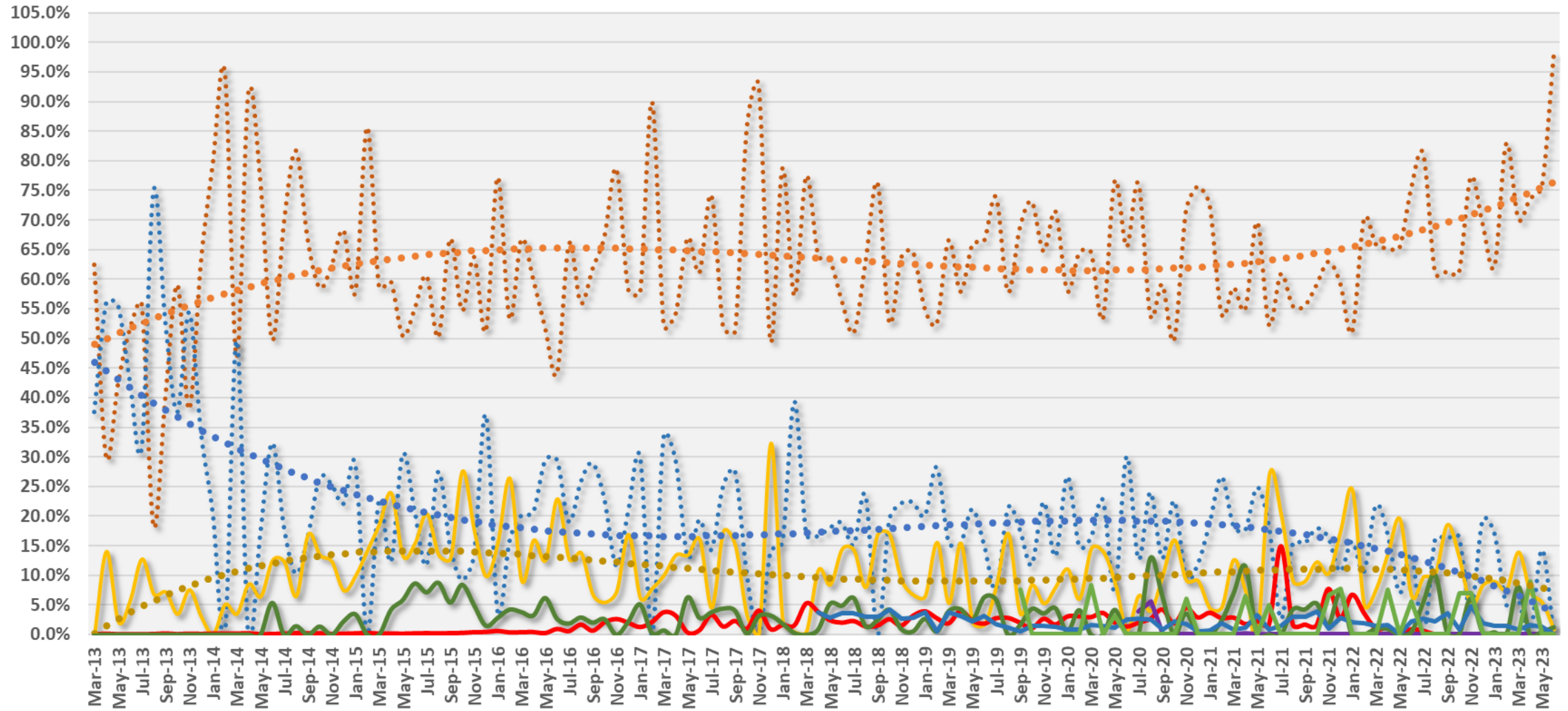


source: International Trade Data, September 2023; Analysis by FutureMetrics



# Market Share of Pellets Imported into the UK

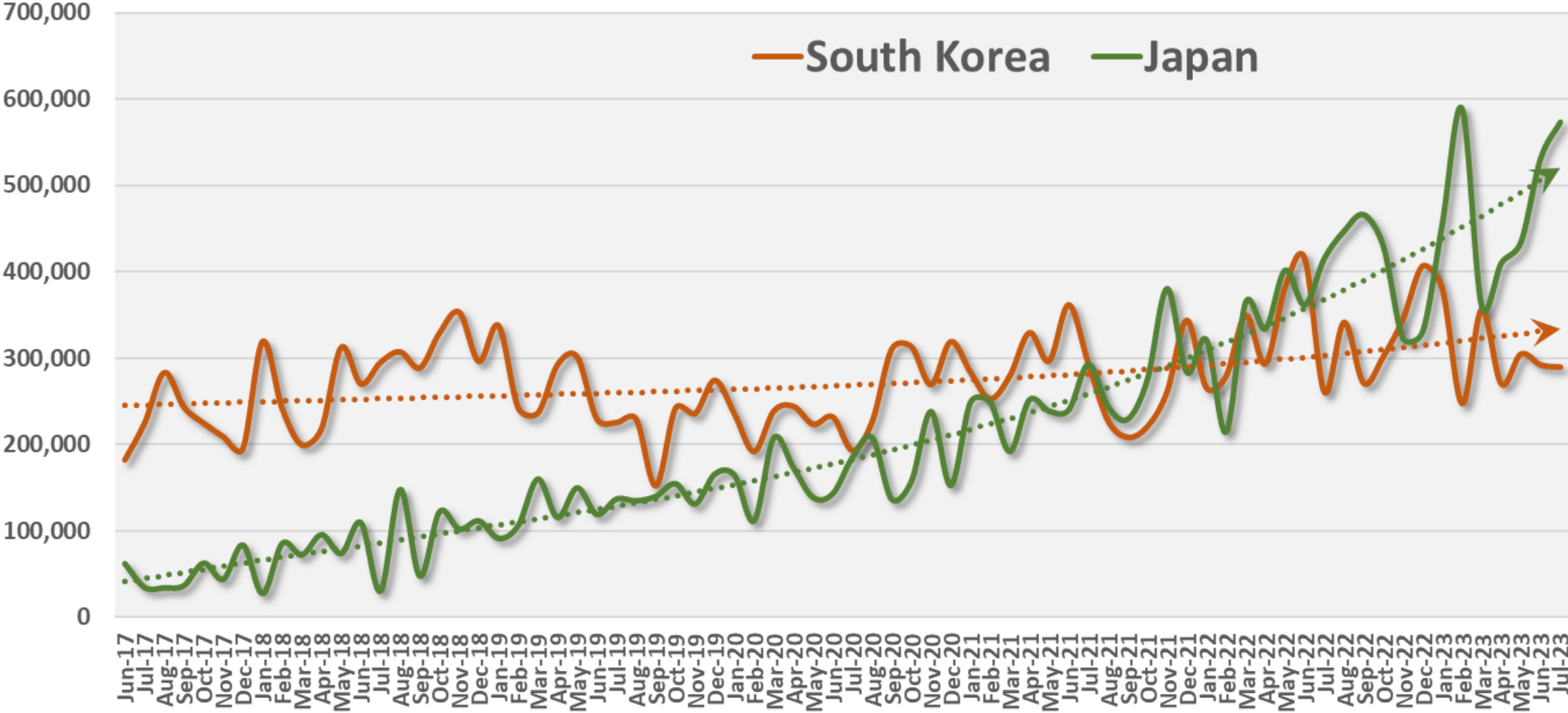
US %   Canada %   Latvia %   Russia %   Lithuania %   Estonia %   Portugal %   Brazil %



source: International Trade Data, September 2023; Analysis by FutureMetrics

# Finally, a comparison of Japan and South Korea

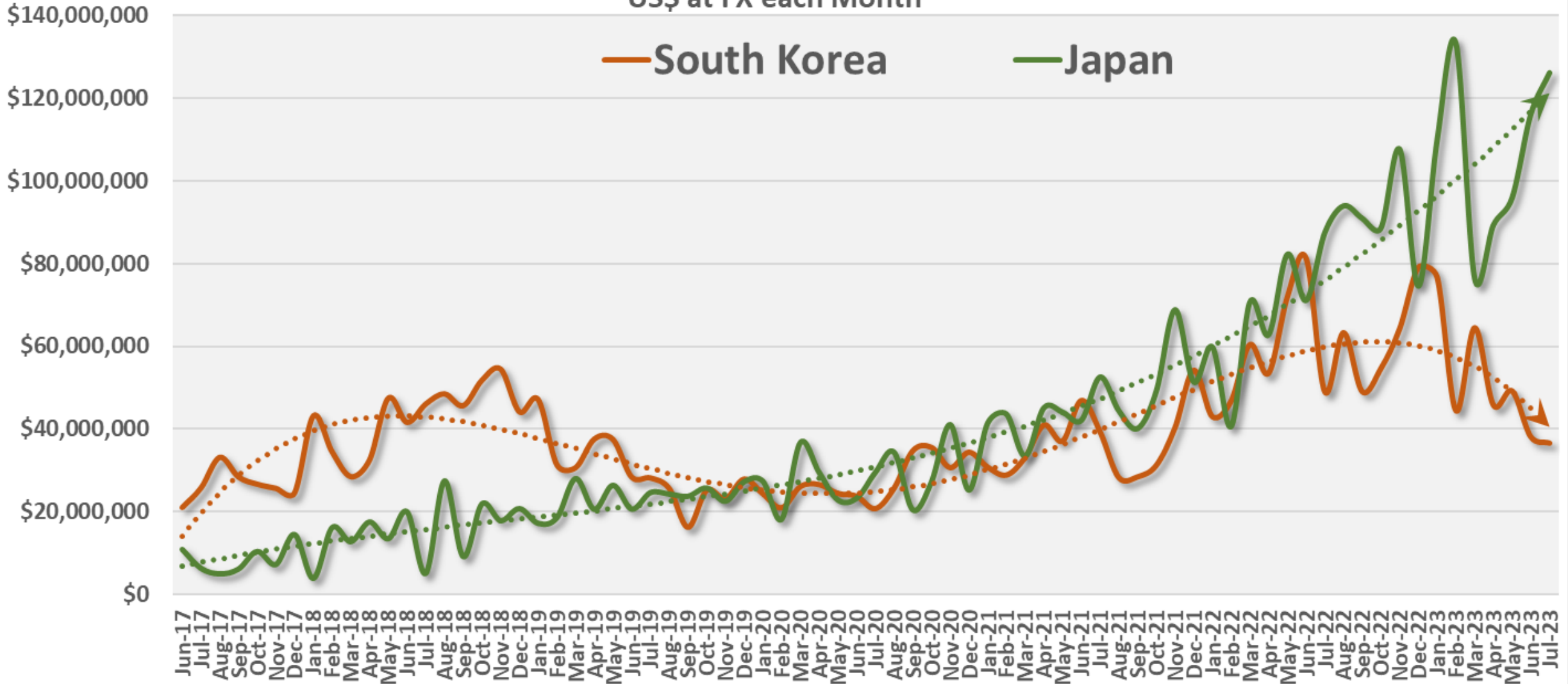
Monthly Pellet Imports into Japan and South Korea  
Metric Tonnes



source: International Trade Data, September 2023; Analysis by FutureMetrics

# Monthly Value of Pellet Imports into Japan and South Korea

US\$ at FX each Month

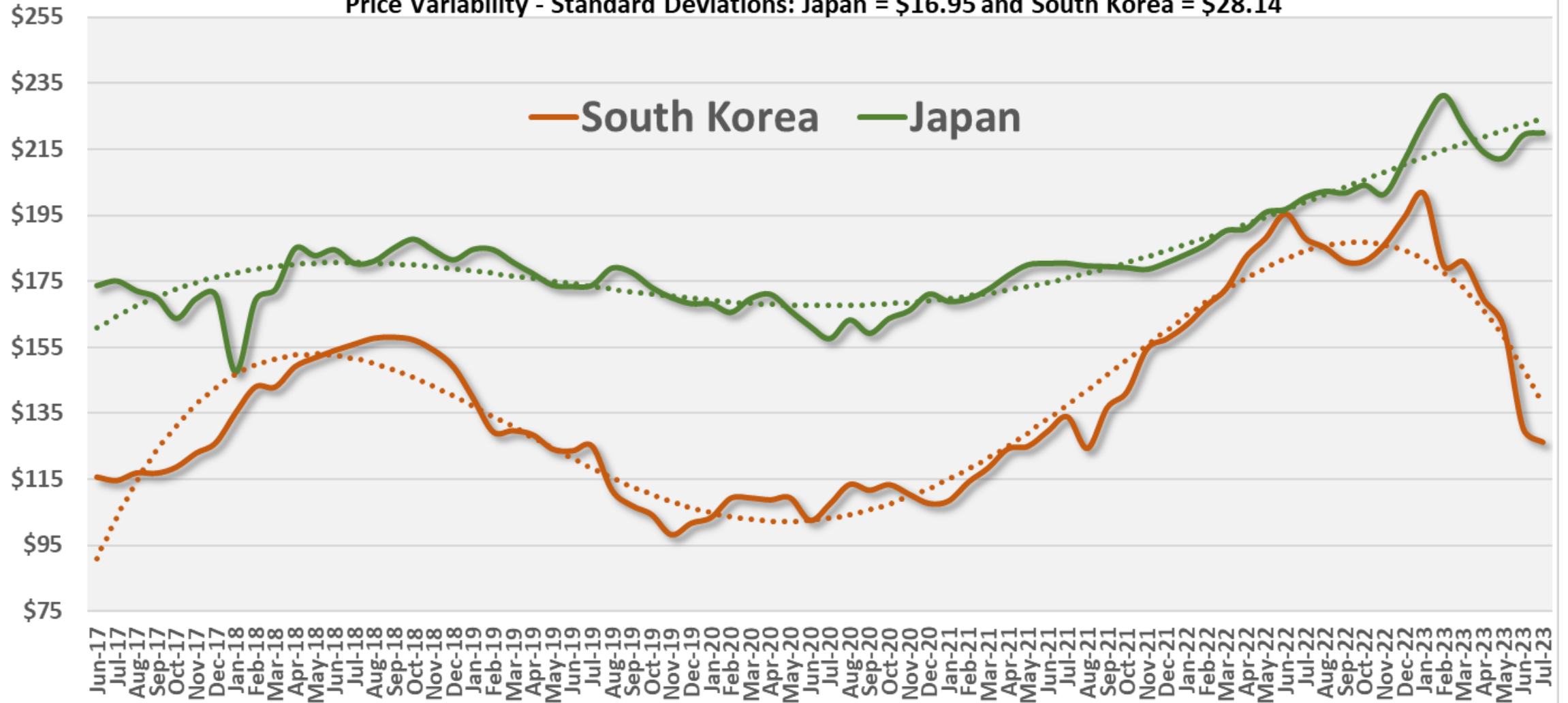


source: International Trade Data, September 2023; Analysis by FutureMetrics

# Monthly FutureMetrics Estimated CIF Prices into Japan and South Korea

## US\$/metric tonne at FX each Month

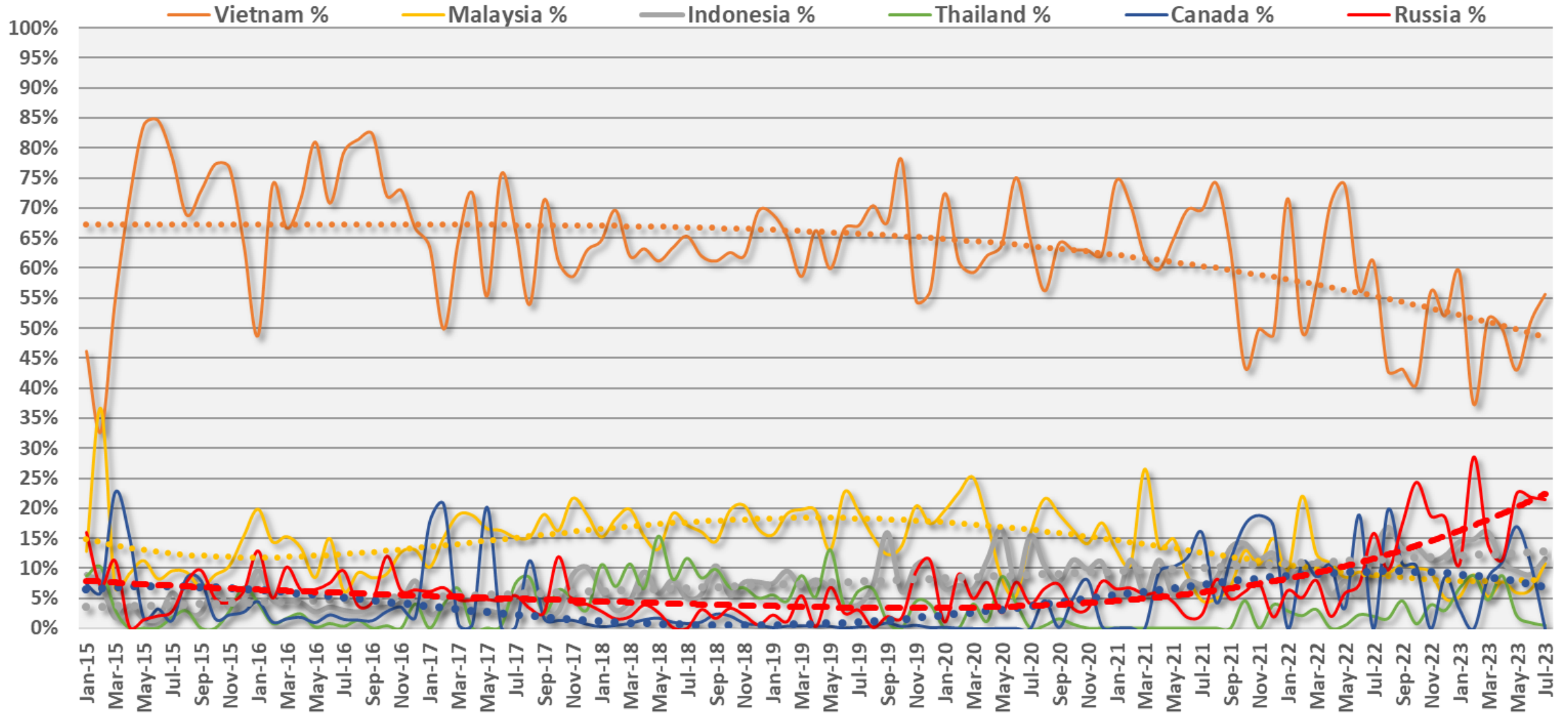
Price Variability - Standard Deviations: Japan = \$16.95 and South Korea = \$28.14



source: International Trade Data, September 2023; Analysis by FutureMetrics

# S. Korea Pellet Suppliers' Market Share

(other smaller supplying countries not shown in chart but included in market share calculation)



source: International Trade Data, September 2023; Analysis by FutureMetrics

**Thank you**

**William Strauss**

**[WilliamStrauss@FutureMetrics.com](mailto:WilliamStrauss@FutureMetrics.com)**



Gord Murray's backyard - Near Revelstoke, BC