

Industrial policy for electric vehicle supply chains and the US-EU fight over the Inflation Reduction Act

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Statistics Netherlands' *Globalisation Week*

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Electric Vehicles – The climate problem

What was the problem?

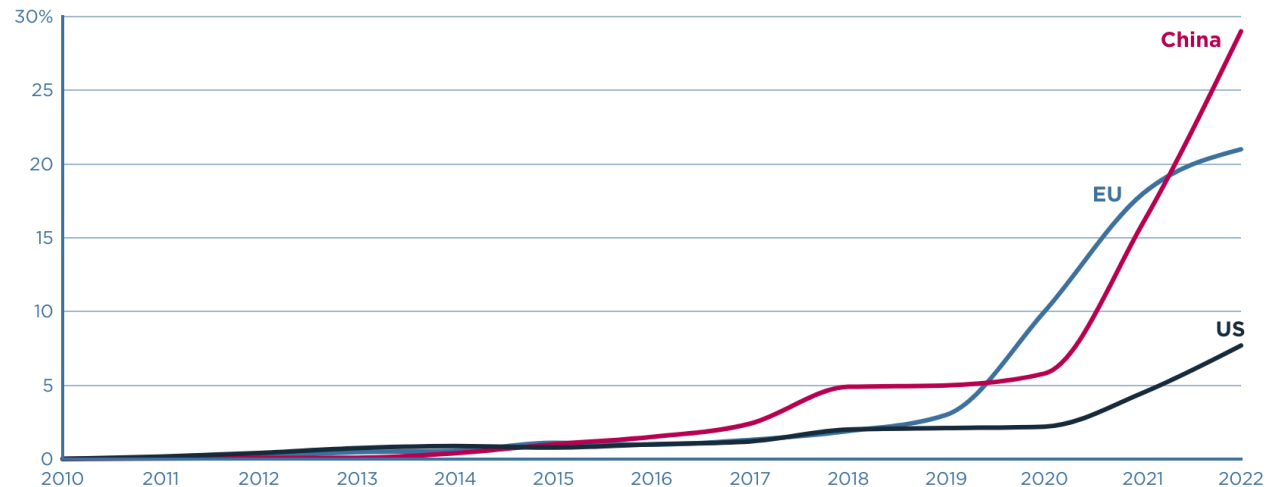
Climate change:

- 38% of US CO₂ emissions is transportation
 - 58% of that is personal vehicles
 - 25% of that is commercial trucks/buses
- US consumers were **not** switching to EVs quickly enough
 - only 5% of new US vehicle penetration in 2021, compared to 16% for China and 18% for EU

Figure 1

The US lags the EU and China in electric vehicle adoption

Electric vehicles as a share of new vehicles entering the domestic market, 2010–22, percent



Notes: Electric vehicles include battery electric vehicles and plug-in hybrids. Figures are based on number of vehicles, not their value.

Source: International Energy Agency.

Electric Vehicles

It is not as if the low US domestic adoption of electric vehicles was because the US was exporting all of its locally-produced EVs to the rest of the world

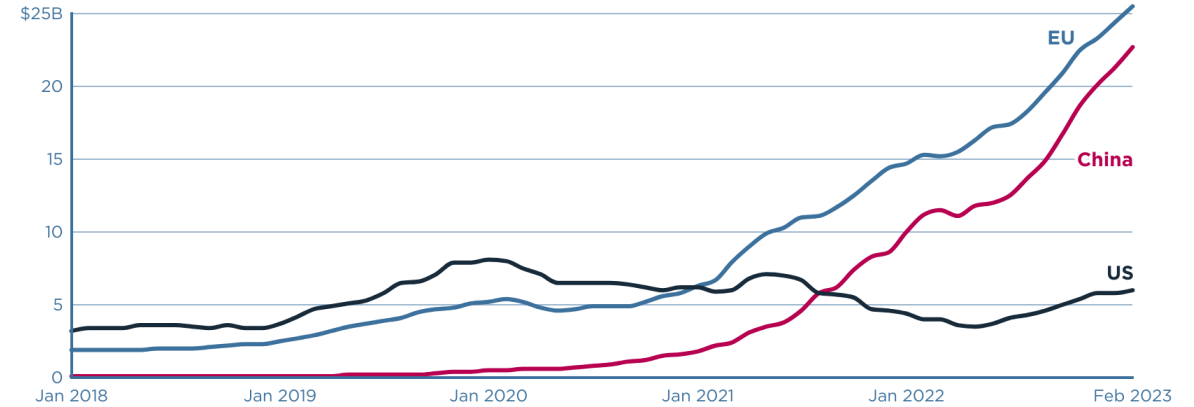
Summarizing other main US policy concerns:

- American consumers have “range anxiety”
- **Jobs:** American policymakers are worried about massive job loss in the transition from internal combustion engine vehicles to EVs (Michigan, Ohio, Georgia, etc.)
 - Think “China Shock II”
- **China** dominates and could **weaponize** (export restrictions) battery input **supply chains** (e.g., critical minerals and components)

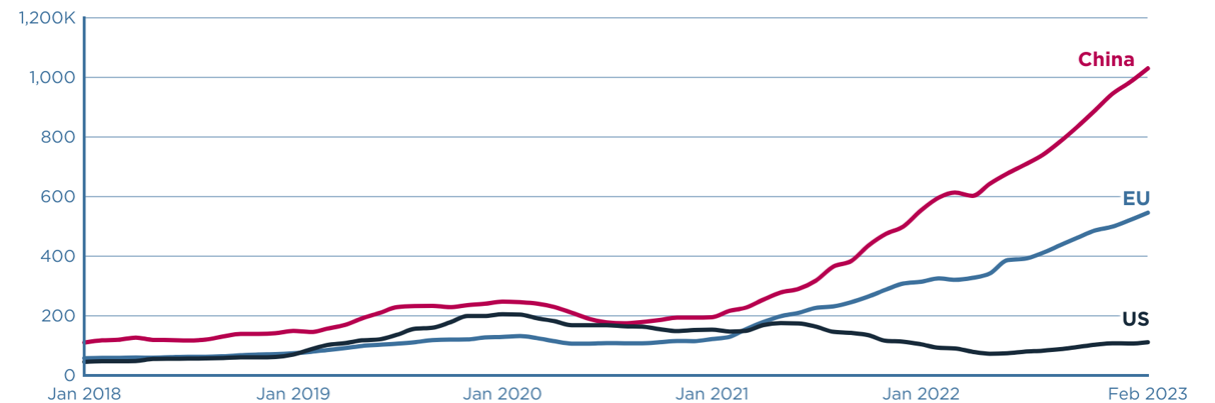
Figure 2

US electric vehicle exports are also trailing China and the EU

a. Value of electric vehicle exports by economy, 12-month trailing sums, billions of USD, 2018-23 (year to date)

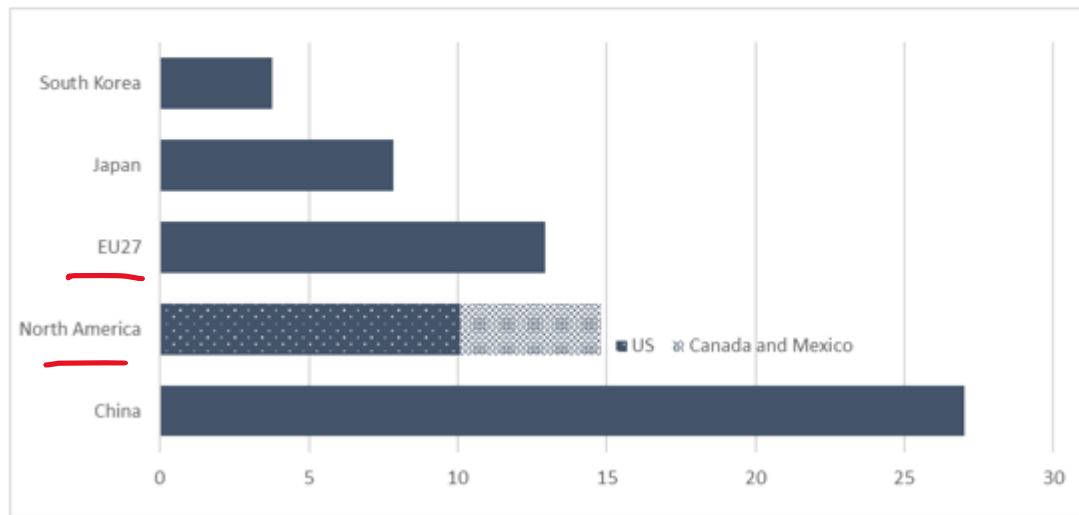


b. Volume of electric vehicle exports by economy, 12-month trailing sums, thousands of vehicles, 2018-23 (year to date)

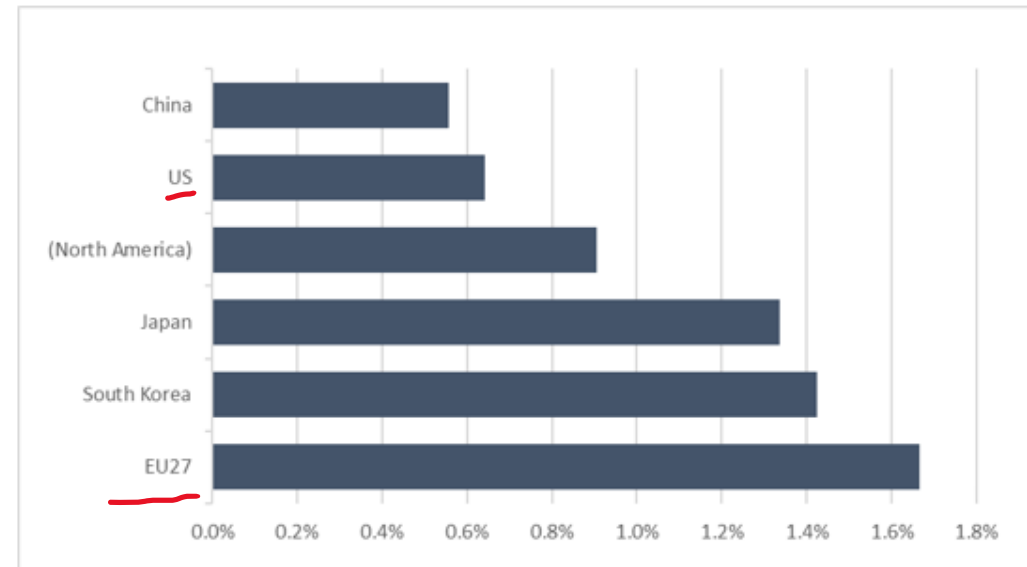


Legacy auto makers are important industries political and economically in **US** and **EU**

a. Total industry vehicle production (millions of units)



b. Share of automotive manufacturing industry employment in total employment (percent)



Source: compiled by the author with data from Bank of Korea; Japan Automotive Manufacturers Association; United States Bureau of Labor Statistics; Eurostat; China National Bureau of Statistics.

Policy Result: Inflation Reduction Act (Aug 2022)

Includes incentives for Electric Vehicles – Section 30D

- **Consumer tax credits** for EVs
 - Add in a price cap and income cap to focus automakers on mass market/volume

But **industrial policy** because the consumer tax credits are contingent on...

- Vehicle assembly in **North America** (local content)
- **Restrictive** EV battery input sourcing requirements: (i) **critical minerals** (US, fta partners, recycled); (ii) **components** (US only) – and no “foreign entities of concern” (China)

Europe gets upset

FINANCIAL TIMES

Emmanuel Macron says US climate law risks 'fragmenting the west'

French leader's criticism on first day of state visit to America shows growing row over Joe Biden's Inflation Reduction Act



Emmanuel Macron delivers remarks at the French embassy in Washington © Brendan Smialowski/AFP

DECEMBER 1 2022

Oops. Biden says we'll "tweak"



Biden says can 'tweak' inflation act to include European countries




WASHINGTON, Dec 1 (Reuters)

IRA – How can the Biden administration “tweak” IRA?

Implementing regulations!

December 29, 2022:

- Treasury makes a bombshell announcement on EV **leasing** – see **Section 45W** 

March 31, 2023:

- For **critical minerals**, Treasury defines a “free trade agreement” country as ones that would
 - reduce or eliminate trade barriers on a preferential basis,
 - commit to not imposing new trade barriers,
 - establish high standards for labor and environment, and
 - not use export restrictions.

Key requirements for qualifying for a tax credit under Sections 30D and 45W of the Inflation Reduction Act

Requirement	Section 30D	Section 45W
Gross vehicle must weigh less than 14,000 pounds	X	X ^a
Vehicle must be used for business		X
Vehicle must be assembled in North America	X	
Manufacturer’s suggested retail price cannot exceed \$80,000 for SUVs, vans, and pickup trucks and \$55,000 for smaller vehicles	X	
Annual adjusted gross income cannot exceed \$300,000 for couples or \$150,000 for individuals	X	
Credit of \$3,750 is granted if critical minerals criterion is satisfied	X	
Credit of \$3,750 is granted if battery components criterion is satisfied	X	
Vehicle must eventually include no critical mineral or battery components from “foreign entity of concern”	X	

Japan signs a critical minerals agreement on March 29.

EU is negotiating. **UK, Indonesia, Philippines** all say they want one...

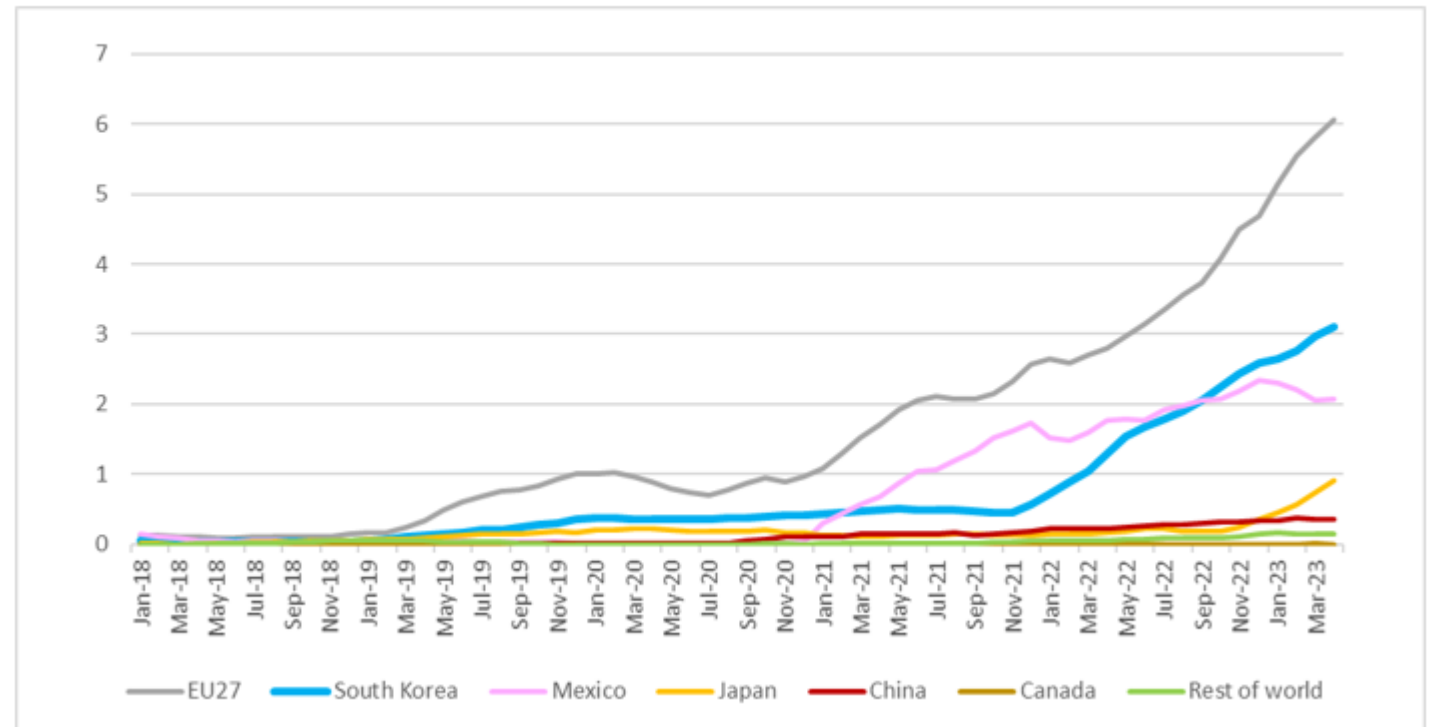
EV data – What has happened so far

Despite IRA, US **imports** of EVs from European Union and South Korea have continued to **boom!**

Why?

- As of Dec 2022, only 10 models qualified for full tax credit (Wards)
 - I.e., there was so little choice for consumers, they bought imports anyway
- Starting Jan 2023 – **LEASING!!!**

Value of US electric vehicle imports, 12-month trailing sums, billions of USD, 2017–23 (year to date)



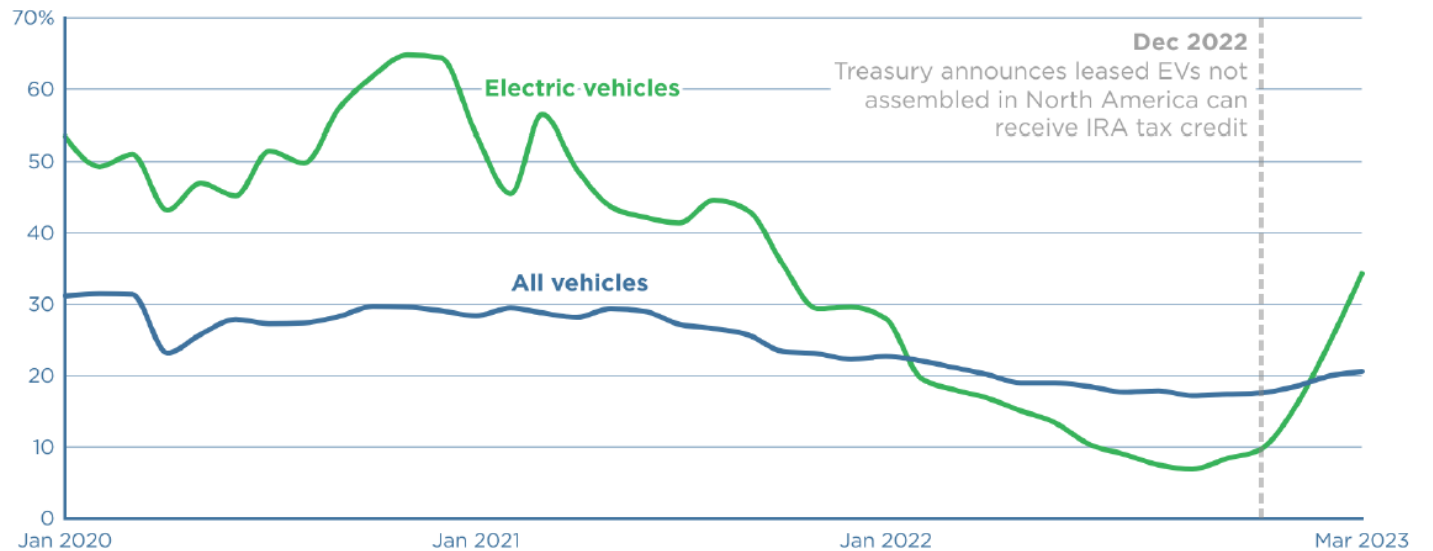
EV data – What has happened so far

December 29, 2022

- Surprise Treasury decision that **leased EVs** are eligible for the Section 45W tax credit
- There is ***NO*** “North American assembly” requirement in Section 45W – so imported EVs are eligible
- EV lease penetration rates
 - Dec 2022: 9.7%
 - Jan 2023: **15.7%**
 - Feb 2023: **24.9%**
 - Mar 2023: **34.3% !!!**

US electric vehicle leases have increased since the eligibility for IRA tax credits was expanded

Leases as a share of all new vehicles entering US market by vehicle type, 2020-23, percent



EV = electric vehicle; IRA = Inflation Reduction Act

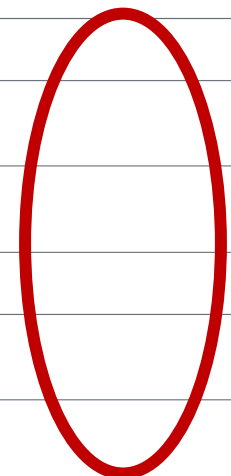
Notes: On December 29, 2022, the US Treasury announced that EVs leased to consumers would be eligible for tax credits under Section 45W of the Inflation Reduction Act.

Source: Edmunds.

IRA – Consequences of Section 45W/Leasing accommodation

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- No **price cap** or **income cap**
- No incentive to move battery supply chains out of **China**
- No North American assembly incentive (**local content/ jobs**)

As an aside, what do EV tariffs look like?

EU tariffs – discriminating against US

- Offering massive preference to South Korea and Japan
- NB: a 10% import tariff is economically equivalent to
 - **10% production subsidy** combined with a 10% consumption tax
 - $€7,500 = €75,000 \times 0.10$
 - I.e., the economic effect of a local content subsidy can arise through large import tariffs

US tariffs – offering preference-like to EU

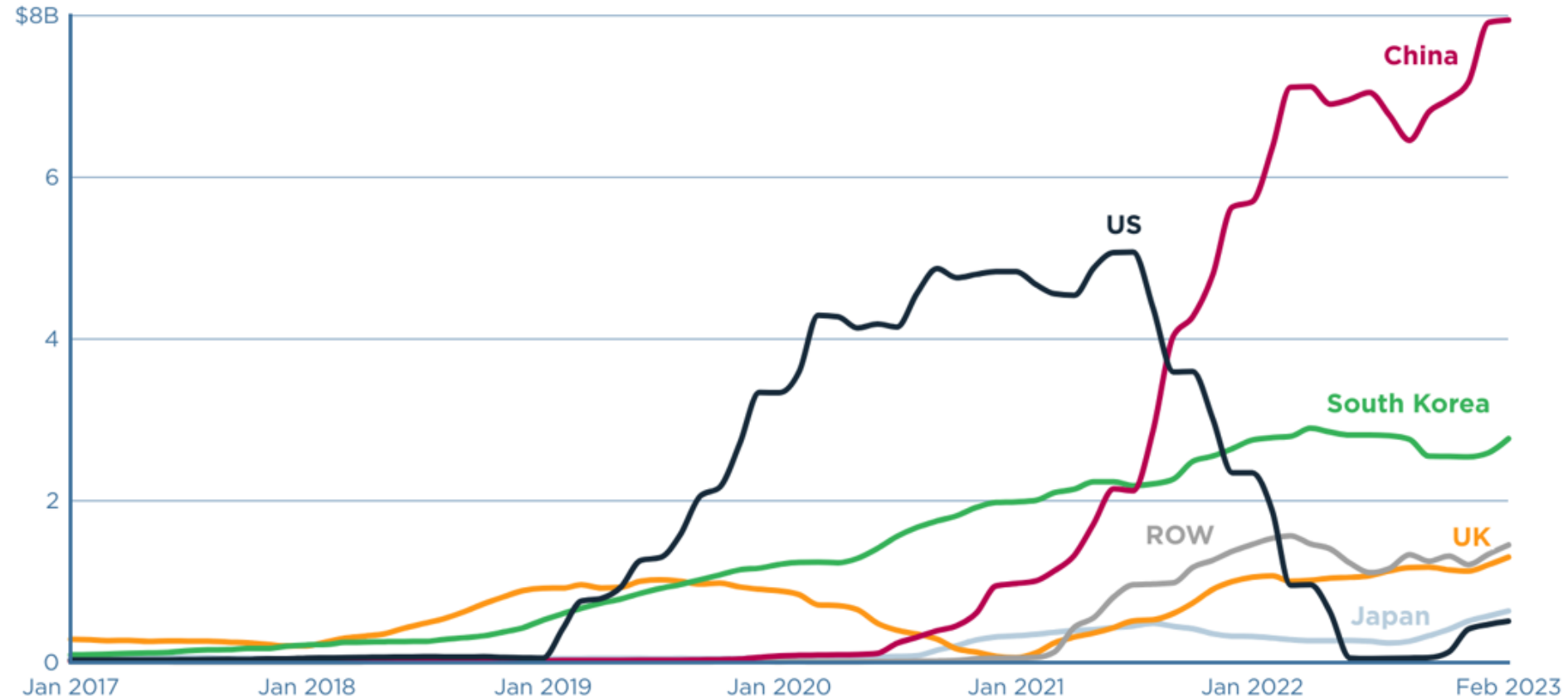
- Low tariff
- Very little preference for South Korea relative to MFN (EU)
- EU enjoys large preference relative to US imports from China (25% US trade war tariffs)

Tariffs on electric vehicles imposed by the United States, the European Union, and China in 2023

Economy	Applied most favored nation (MFN) tariff (percent)	Exceptions
United States	<u>2.5</u>	<ul style="list-style-type: none"> • Mexico: 0 percent (under the United States–Mexico–Canada Agreement [USMCA]) • Canada: 0 percent (under the USMCA) • South Korea: 0 percent (under the US–Korea Free Trade Agreement [KORUS]) • <u>China: 27.5 percent</u> (applied MFN tariff + trade war tariff) imposed since July 2018
European Union	<u>10.0</u>	<ul style="list-style-type: none"> • <u>South Korea: 0 percent</u> (under the EU–Republic of Korea Free Trade Agreement) • <u>Japan: 3.8 percent</u> (under the EU–Japan Economic Partnership Agreement) • Canada: 0 percent (under the EU–Canada Comprehensive Economic and Trade Agreement) • Mexico: 0 percent (under the EU–Mexico Trade Agreement)
China	15.0	<ul style="list-style-type: none"> • Applied MFN was 25 percent until July 2018, when it was lowered to 15 percent • United States: 40 percent tariff (applied MFN + retaliatory tariff) between July 2018 and January 2019 during the trade war, then reduced to 15 percent • South Korea: 13.5 percent (under Asia-Pacific Trade Agreement) • Japan: 15 percent (under Regional Comprehensive Economic Partnership)

The EU used to import electric vehicles from the US but now mostly imports from China and South Korea

Value of EU electric vehicle imports, 12-month trailing sums, billions of USD, 2017-23 (year to date)



Even if the EV saga is over, EU problems with IRA remain

- Take IRA's other production tax credits (Section 45X) for clean energy – batteries, wind, solar, clean hydrogen, carbon capture
 - Effect will be to **reduce** energy prices in the US
- Whereas the EU's climate change policy...
 - Carbon pricing, emissions trading system, phasing out free allowance, CBAM
- ...would result in **higher** energy prices in the EU
- **Competitiveness concerns** for downstream, energy-intensive EU industries (e.g., steel, aluminum, fertilizer, chemicals, cement, glass)
- What's the **EU-US solution** to that challenge?



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- **Chad P. Bown. 2023. Industrial policy for electric vehicle supply chains and the US-EU fight over the Inflation Reduction Act. *PIIE Working Paper 23-1*, May.**
Chad P. Bown. 2023. The US-EU fights over electric vehicles and the Inflation Reduction Act. *Trade Talks* podcast episode 184, May 7.

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