The CAREC region's increasing trade in low carbon technology - a reflection of increased electric mobility and of a new wave of (smart) electrification

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Hans Holzhacker, CAREC Institute

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Trade in low-carbon technology (LCT) products helps countries to obtain the tools needed for advanced electrification, decarbonization, and energy efficiency.

Some definitions of low-carbon technology products in international trade…

- **The European Commission's Knowledge4Policy, defines low-carbon technology as "carbon reduction technology, carbon-free technology, carbon removal technology, carbon management technology, resource-saving and recycling technology".**
- **The World Economic Forum refers to it as "innovative technical solutions that are characterized by a low emission intensity, compared to state of the art alternatives".**
- **The IMF sees LCT products as "products that produce less pollution than their traditional energy counterparts, and will play a vital role in the transition to a low carbon economy". The IMF provides HS-6-digit codes.**

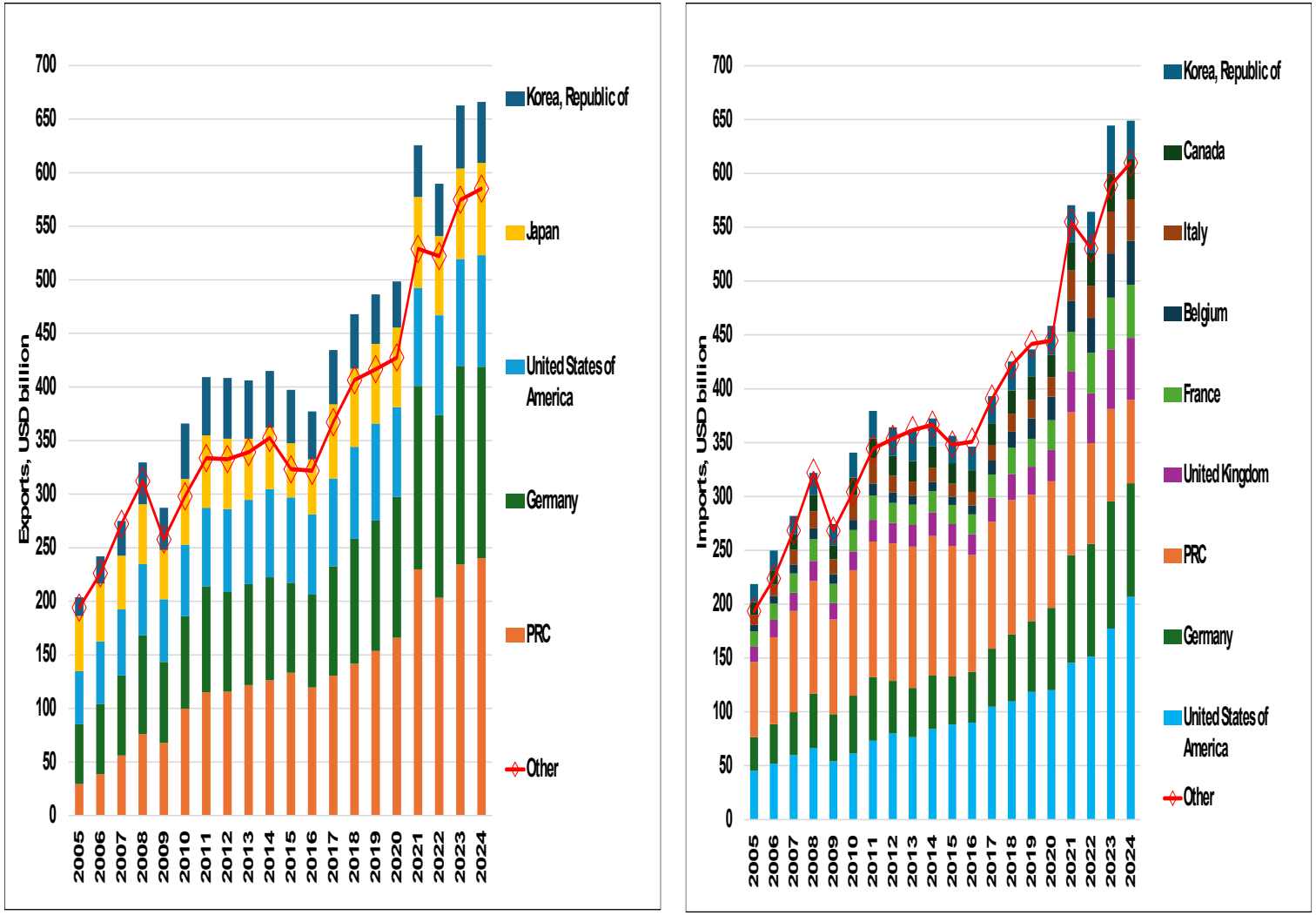
Sources:
https://knowledge4policy.ec.europa.eu/glossary-item/low-carbon-technology_en;
https://www.weforum.org/stories/2022/02/what-are-low-carbon-emitting-technologies-an-expert-explains/
https://climatedata.imf.org/documents/e46085cc97e445bb9c69e7de3bffbbac/explore

The globally traded LCT value went from roughly USD 400 bn in 2005 to USD 1250 bn in 2024 (at current USD prices).

Main drivers of global trade in LCT were the PRC, Germany, the USA, Japan, and the Republic of Korea.

All of them saw substantial growth in their LCT exports, and – except for the PRC – also their imports.

Global Exports and Imports of LCT Products by Major Countries



Source: TradeMap, author's calculations

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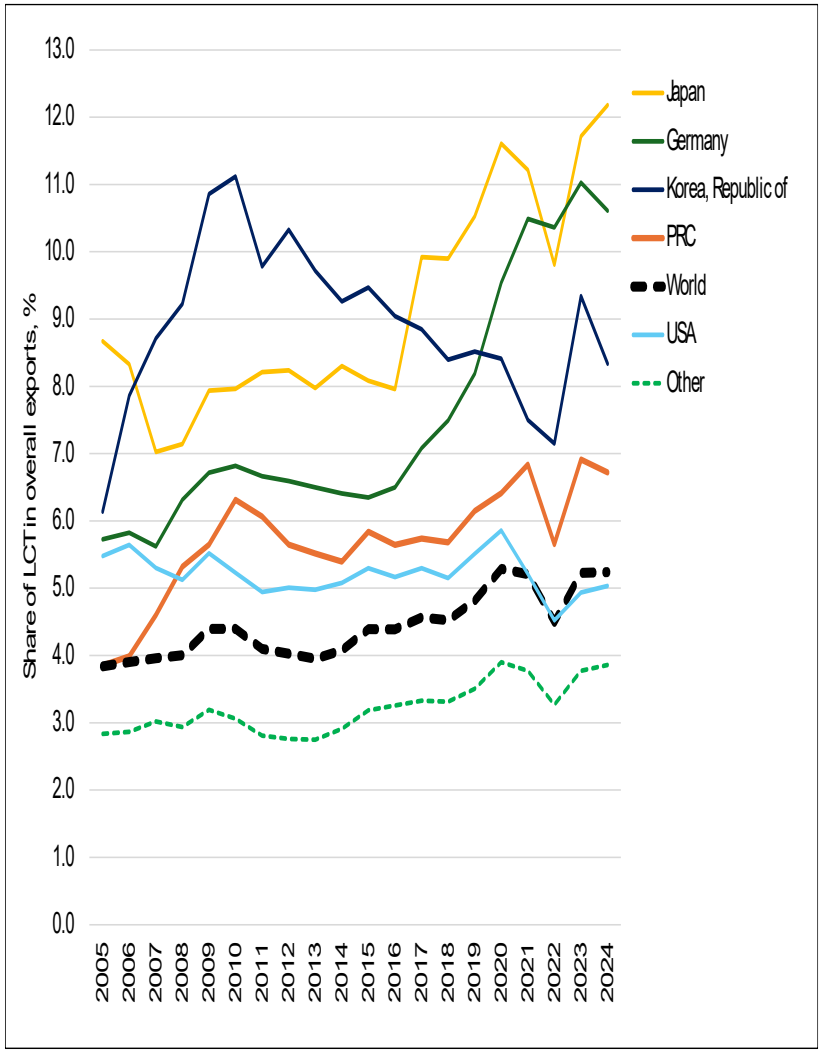
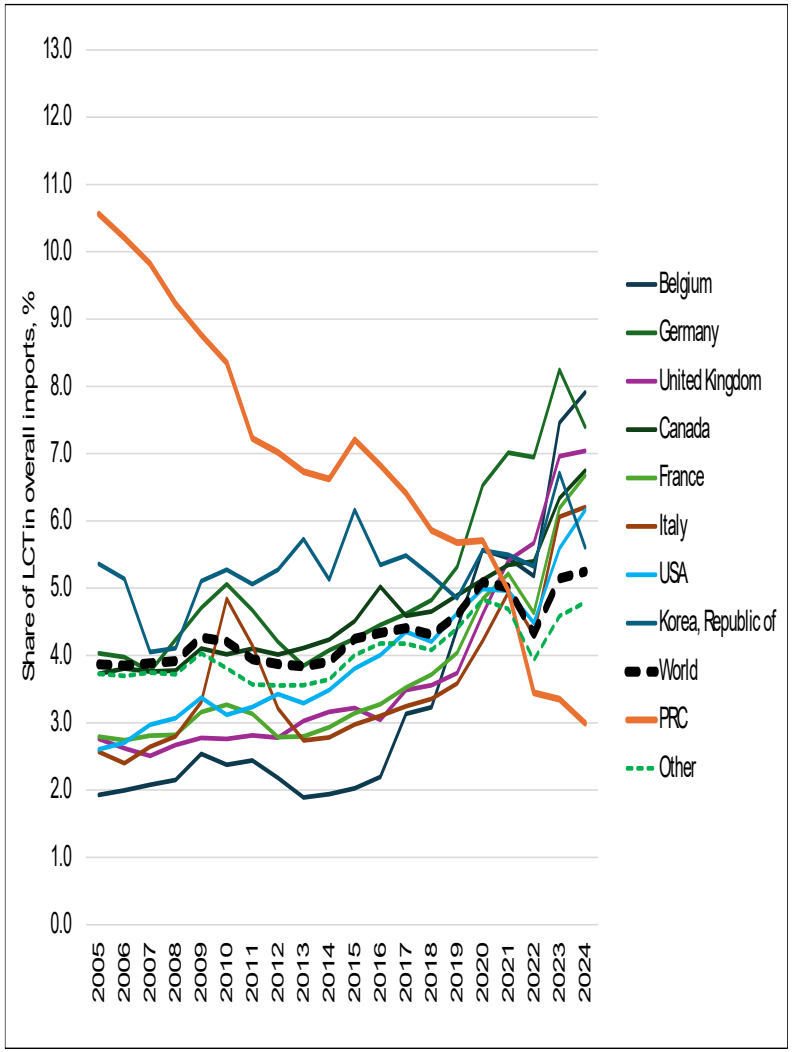
The LCT share in overall trade has increased substantially.

All the major LCT exporting countries, except for the USA, had a higher LCT share in their overall exports in 2024 than in 2005.

All the major LCT importers, except for the PRC, had a higher LCT share in their imports in 2024 than in 2005.

Share of LCT in overall Imports by Country





Source: TradeMap, author's calculations

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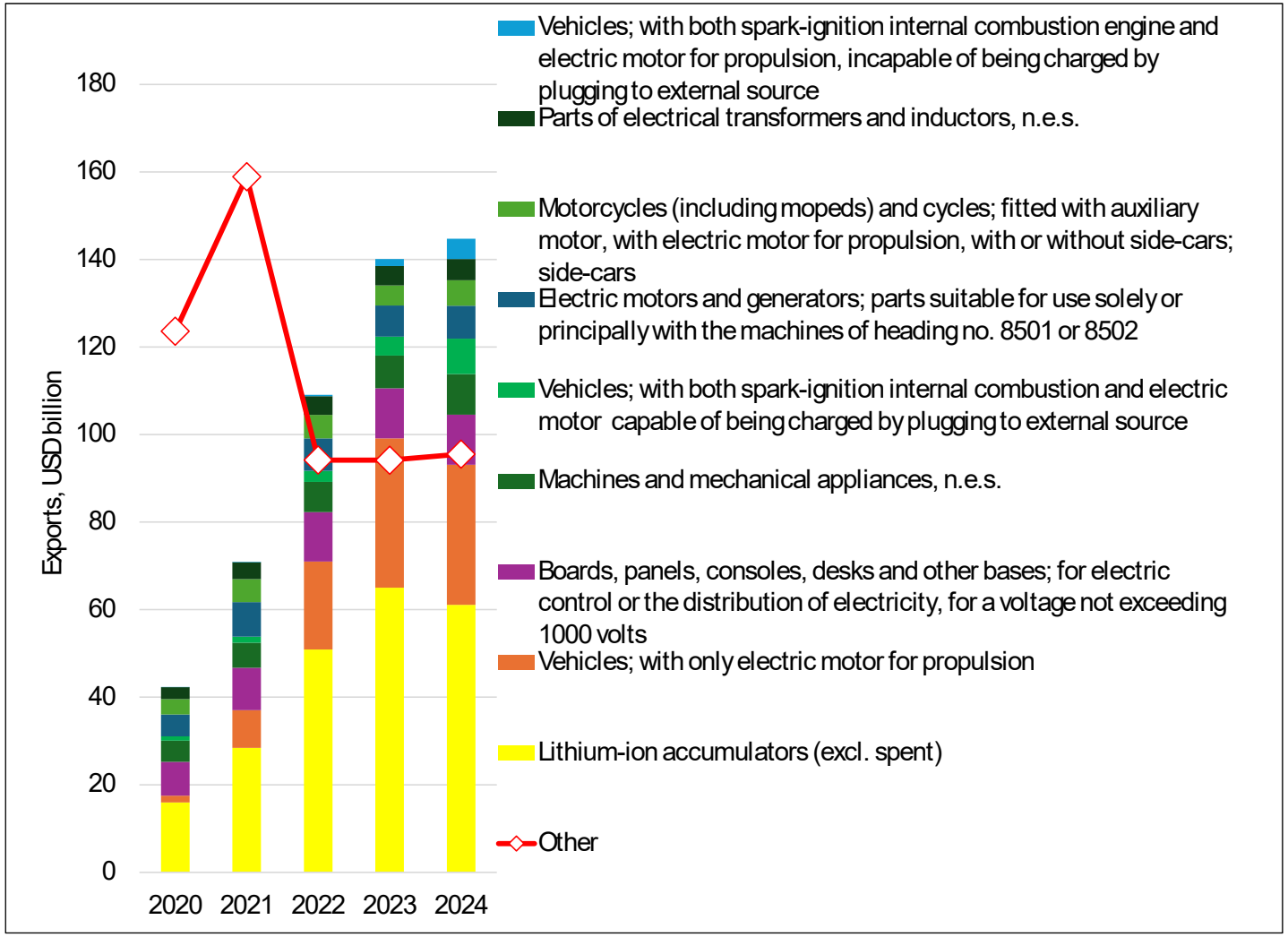
The PRC, the World's largest LCT exporter, is well known for exporting electrical vehicles.

However, the share of three main EV export categories was together 18.6% of the PRC's LCT exports in 2024, but the one of lithium-ion accumulators was 25.4%.

The PRC supplied 51% of global lithium-ion accumulator (battery) imports in 2024.

LCT Exports of the PRC Globally by Main Products



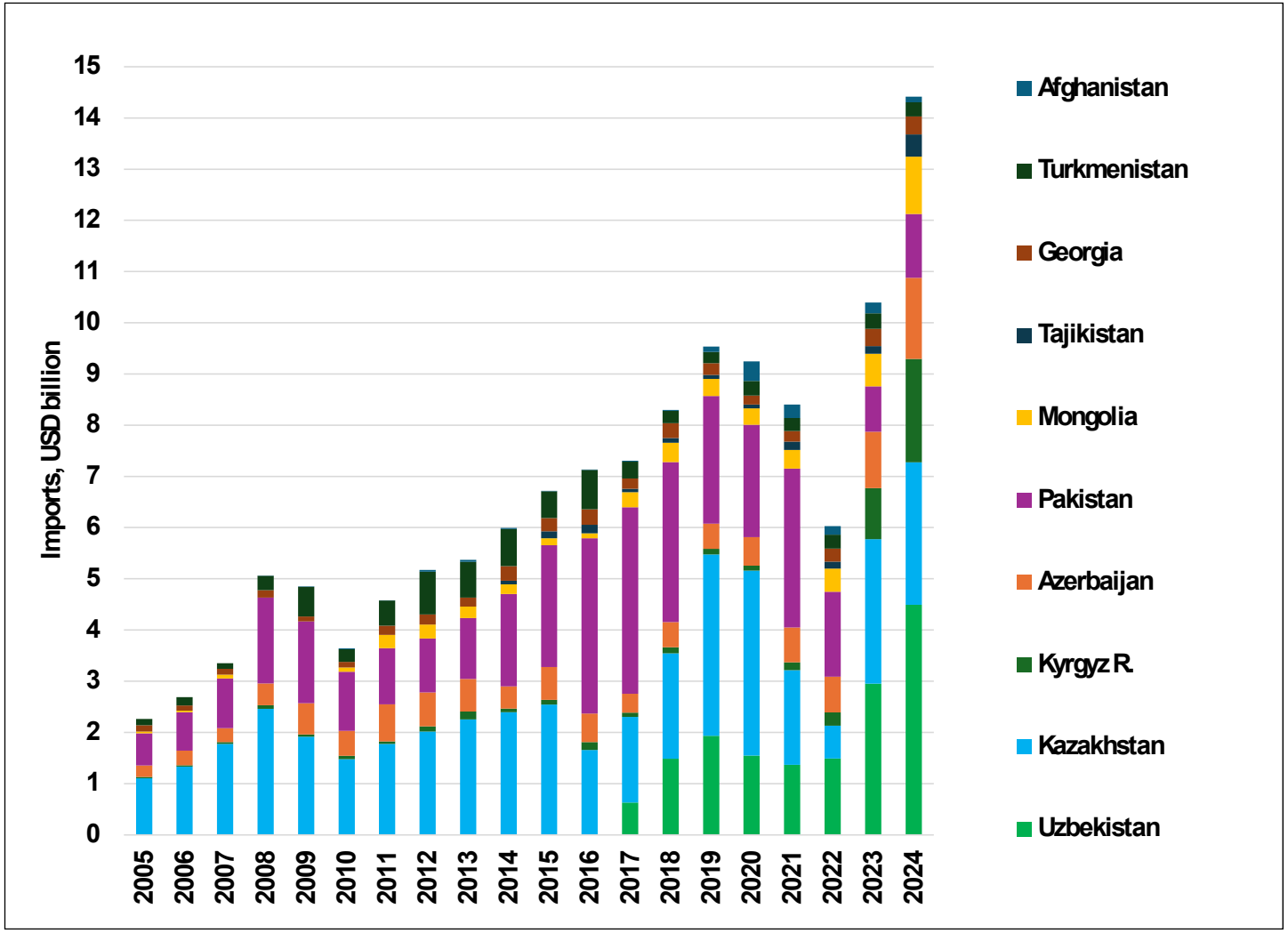
Source: TradeMap, author's calculations

The CAREC region's (other than the PRC) LCT imports reached USD 14.4 billion in 2024.

Uzbekistan became the largest importer, followed by Kazakhstan, the Kyrgyz Republic and Azerbaijan.

LCT exports of the region had a value of USD 909 million in 2024.

Imports of LCT by Importing CAREC Country (other than the PRC)



Source: TradeMap, author's calculations

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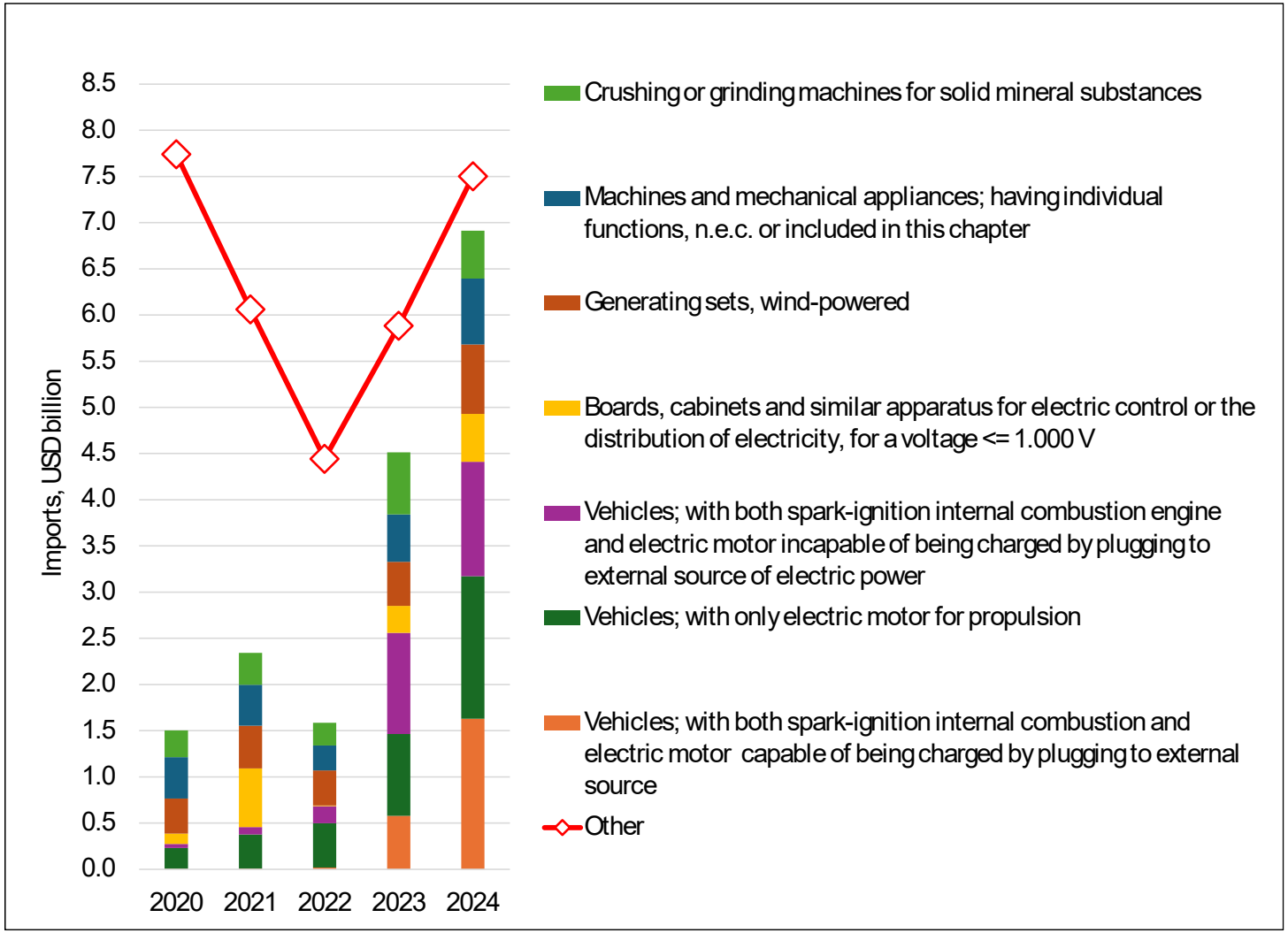
EVs + electrification!

The product mix of the LCT imports of the CAREC region significantly changed towards EVs from 2023 on.

However, other important CAREC LCT imports are related to the region's new wave of electrification such as "generating sets, wind-powered"

CAREC (other than the PRC) LCT Imports by Main Products



Source: TradeMap, author's calculations

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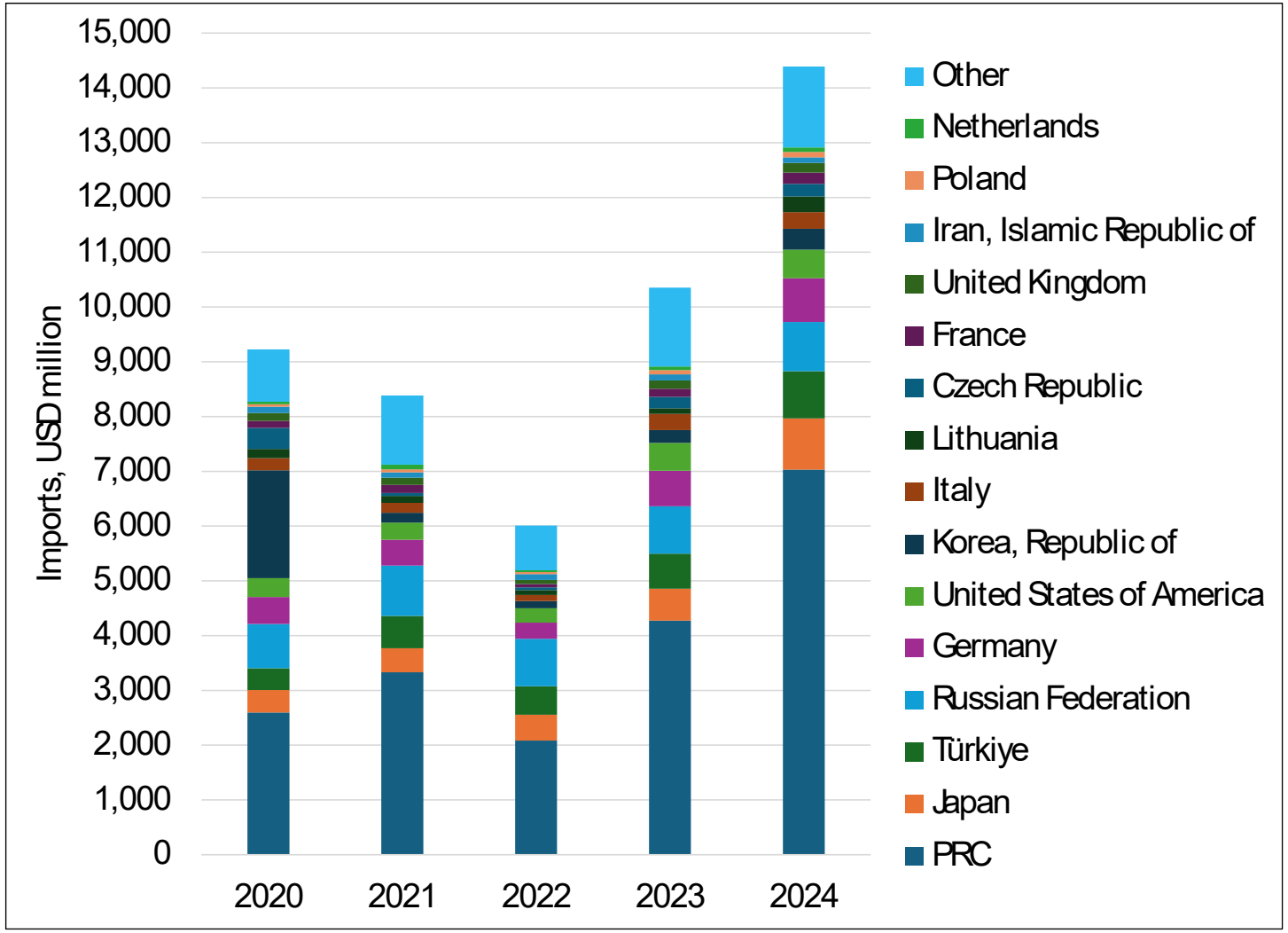
The PRC is the largest supplier of LCT products to the CAREC region by far.

The PRC provided LCT products in the amount of USD 7 bn in 2024, roughly one-half of total CAREC LCT imports.

This was followed in substantial distance by Japan, Türkiye, and the Russia, with about USD 0.9 billion each.

CAREC (other than the PRC) Imports by Exporting Countries



Source: TradeMap, author's calculations

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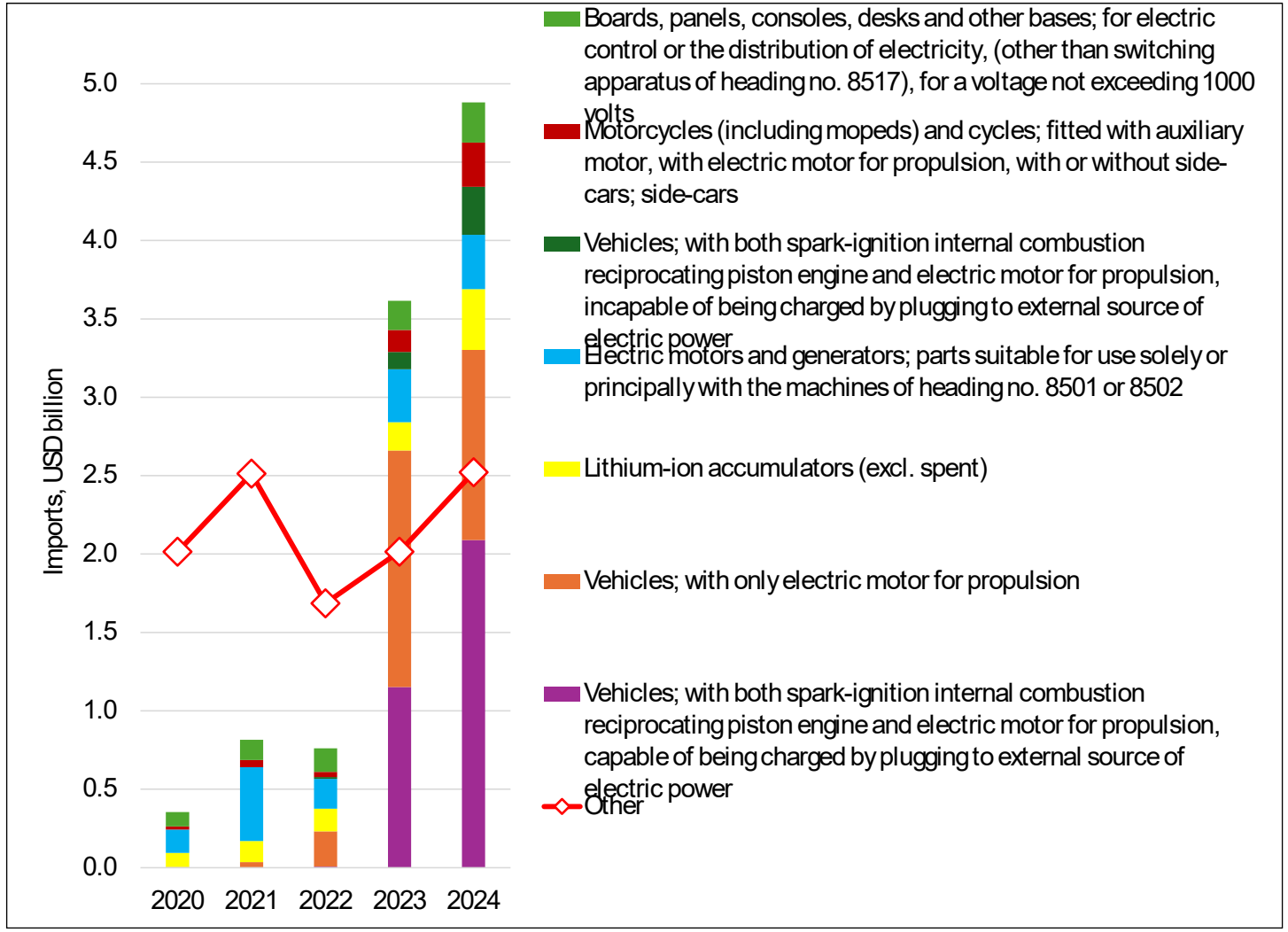
Especially rising EV imports drove the CAREC region's sharply increased LCT imports from the PRC.

However, other major LCT imports were lithium-ion accumulators, electric motors and generators, and panels.

A new wave of electrification will further support this trade.

CAREC (other than the PRC) LCT Imports from the PRC by Main Products



Source: TradeMap, author's calculations

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A new wave of electrification

Given that a substantial part of the CAREC region's LCT trade is related to electricity generation, distribution and control,

accelerated electrification will further increase the CAREC region's LCT trade in future.

- ***Kazakhstan** has projects underway in the West Kazakhstan region to build wind, solar, and hybrid power plants. In eastern Kazakhstan, there are plans to build five new hydroelectric power plants. The country also plans a large nuclear power plant at Lake Balkhash and potentially in the West of the country.*

- ***Uzbekistan** is aiming to increase its share of renewables to 25% by 2026, primarily through solar photovoltaic power stations. In 2025-2026, solar photovoltaic power stations with a total installed capacity of 1,800 megawatts will be commissioned.*

- ***The Kambarata-1 hydropower plant (1.86 GW) is a trilateral initiative boosting hydro capacity, water management, and regional electricity trade across the Kyrgyz Republic, Uzbekistan, and Kazakhstan.***

A new wave of electrification (continued)

Given that a substantial part of the CAREC region's LCT trade is related to electricity generation, distribution and control,

accelerated electrification will further increase the CAREC region's LCT trade in future.

- ***Tajikistan** continues works at the Rogun hydropower plant (3600 MW) and the Central Asia Power System (CAPS) reconnection. A data center shall be built that use the Rogun electricity.*

- ***Turkmenistan** is also looking at investments in the hydrogen sector and plans to build a hybrid solar-wind power station.*

- ***Azerbaijan and Georgia** too invest heavily in new electrification, in projects such as four regional solar plants (500 MW total) in Aghdam, Jabrayil, Fuzuli, and Kalbajar in Azerbaijan, or the power stations in the Samtskhe-Javakheti, Kakheti, Shida Kartli and Imereti regions of Georgia.*

- ***Pakistan** as well has highly ambitious electrification plans with projects of many gigawatts such as Bunji (hydro), Bahawalpur (solar), Chashma (nuclear) and many others.*

Localized EV production

Localized EV production/assembly will increase the CAREC region's LCT trade, mostly due to the import of components.

Localized EV production also holds some potential of higher CAREC exports, especially intra-CAREC exports.

- ***Uzbekistan** has already an operational EV production, notably via BYD's Jizzakh plant, and is rapidly scaling up with a target of 500,000 vehicles annually, amongst increasing localization ambitions .*

- ***In Kazakhstan, two plants for the production of cars and parts will be launched. One of them will produce cars of Chinese brands. It is designed for a production capacity of more than 100 thousand cars. For the spare parts the localization of the production of is foreseen.***

- ***BYD also plans a car plant in Karachi, Pakistan, that should be operational by 2026 . And a group of Chinese firms has pledged to invest USD 340 million in Pakistan's EV sector to expand manufacturing plants and charging stations.***

Looking forward to a fruitful discussion and seminar!!

https://www.carecinstitute.org/

hans.holzhacker@carecinstitute.org

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