Economic Brief

The CAREC Region's Electric Vehicle (EV) and Charging Infrastructure Development Recap 2024

By
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May 2025

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Abbreviations

ADB	Asian Development Bank
BEV	Battery Electric Vehicle
CAREC	Central Asia Regional Economic Cooperation
CNY	Chinese Yuan
DC	Direct Current
EAEU	Eurasian Economic Union
EBRD	European Bank for Reconstruction and Development
EFTA	European Free Trade Association
EU	European Union
EV	Electric Vehicle
FDI	Foreign Direct Investment
ICEV	Internal Combustion Engine Vehicle
IEA	International Energy Agency
KZT	Kazakhstan Tenge
mln	Million
NEV	New Energy Vehicle
PHEV	Plug-in Hybrid Electric Vehicle
PRC	People's Republic of China
UK	United Kingdom
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
US	United States
USD	United States Dollar
VAT	Value Added Tax
yoy	year on year

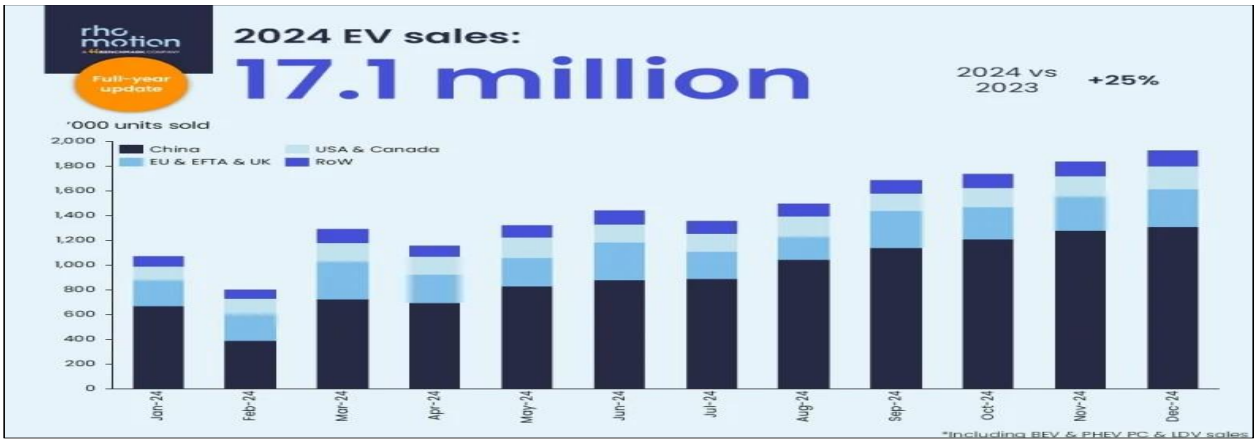
Global temperature has been continuing to rise in the past few decades, with 2024 being the warmest year on record, according to the World Meteorological Organization.[1] Sustained decarbonization is able to slow down and eventually reverse the rapid temperature rise. E-mobility, as one of the most effective ways of reducing greenhouse gas emissions in the transport sector, has become more and more prevailing across the world in recent years. The CAREC countries (except for the PRC) were not pioneers in the transition to e-mobility, but many of them saw growing interests towards EV adoption, particularly in the last two or three years. The CAREC Institute, as a knowledge arm of the CAREC Program initiated by ADB, noted its member countries' passion for e-mobility and has produced several studies on this topic since last year, including an economic brief under the title of "Promoting Electric Vehicle (EV) Deployment in the CAREC Region"[2], and a visiting fellow report on "Decarbonizing Road Transport: CAREC Countries' Transition to Electric Mobility"[3]. Given the EV industry develops fast and the data are rather dynamic, showcasing the latest 2024 data should add value to the overall understanding of the current e-mobility transition status of the region. The brief starts with an overview of global EV sales in 2024, followed by the current EV and infrastructure deployment in the CAREC region, and concludes with the limitations this brief and future research intentions. In addition, it provides a case study of Kazakhstan, assessing the impact of electricity tariff and gasoline price changes on the country's EV adoption process, and a snapshot of the PRC's NEV exports in 2024.

Global EV sales continued to expand in 2024.

The EV[4] markets continued to expand worldwide in 2024. Resembling the earlier prospects stated in the Global EV Outlook 2024, global EV sales saw a 25% yoy increase to 17.1 million units in 2024 compared to 2023 (Figure 1), according to Rho Motion, a leading UK EV research house.[5] The PRC played a significant role in bringing this figure up thanks to its upgraded vehicle trade-in[6] policy scheme, as well as the price battle that took place among the automakers since the beginning of 2024. The increased subsidy to purchasers combined with the lowered prices spurred the country's EV sales to grow by 40% yoy to 11 million in 2024. The sales in the US and Canada markets ended 2024 up by 9% yoy with 1.8 million vehicles sold, attributed at least partially to the US's EV tax credits that would be possibly eliminated by the Trump administration. By contrast, the EU, EFTA and UK market saw a 3% yoy decline in EV sales with 3.0 million vehicles sold in 2024. Germany's removal of subsidies from December 2023 that triggered EV sales in the country to fall by 28% in 2024 is one of the reasons for this contraction. Cumulatively, the rest of the world sold 1.3 million units of EVs in 2024, representing an increase of 27% yoy.

[1] https://wmo.int/news/media-centre/wmo-confirms-2024-warmest-year-record-about-155degc-above-pre-industrial-level
[2] https://www.carecinstitute.org/wp-content/uploads/2024/01/Promoting-Electric-Vehicle-EV-Deployment-in-the-CAREC-Region.pdf
[3] https://www.carecinstitute.org/wp-content/uploads/2025/04/Visiting-Fellow-Program-Decarbonizing-Road-Transport-CAREC-Countries-transition-to-electric-mobility.pdf
[4] The EV here includes only battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs). BEVs are driven purely by electricity through on-board batteries. PHEVs are similar to conventional hybrids but can be charged by plugging into a socket. In the PRC, it is known as new energy vehicles (NEVs), which covers a broader range of EV types. However, it mainly refers to BEV, PHEV, and FCEV (Fuel Cell Electric Vehicle: it generates electricity through the chemical reaction of combining hydrogen and oxygen into water).
[5] https://rhomotion.com/news/over-17-million-evs-sold-in-2024-record-year/
[6] The trade-in campaign is a China's policy instrument aiming to boost the consumption of consumer goods (automobiles in particular) through government subsidies.

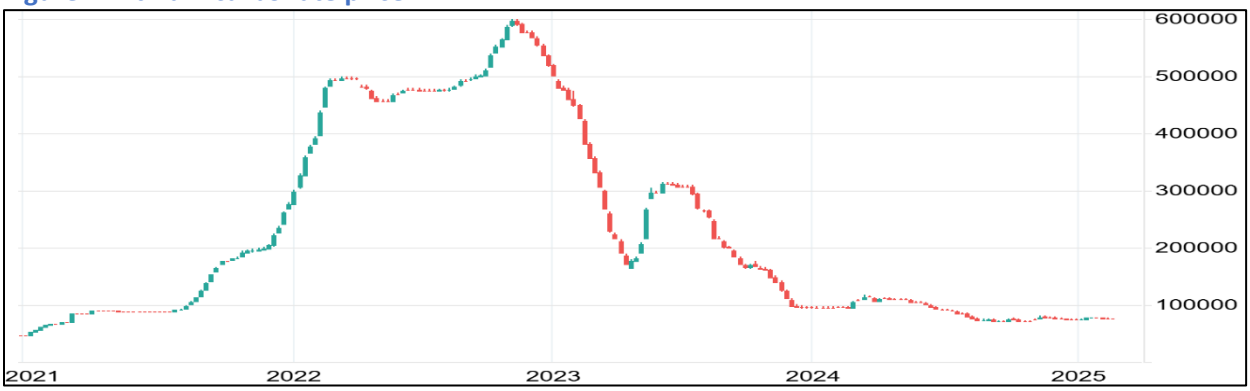
Figure 1. Global EV sales in 2024



Source: Rho Motion

The drop in battery prices significantly reduced the costs of EV production. According to the Annual Battery Price Survey released by BloombergNEF, the volume-weighted average price for lithium-ion battery packs fell by 20% from USD 144 per kilowatt-hour in 2023 to USD 115 in 2024, the biggest annual decline since 2017.[7] While overcapacity of battery cell production, economy of scale, and competitive dynamics led to the drastic reduction in battery costs, cheaper materials and components further brought down the battery prices. The lithium carbonate[8] price, for instance, dropped from the peak of CNY 600,000 per tonne in November 2022 to around CNY 74,000 (USD 10,320) by the end of 2024 (Figure 2). The Survey estimated that the average cost of batteries would dip below 100 US dollars per kilowatt-hour as soon as 2026 thereby achieving price parity[9] between battery electric vehicles (BEVs) and internal combustion engine vehicles (ICEVs), before dropping further to USD 69 by 2030. Indeed, the cost of battery packs has been below the 100 US dollars per kilowatt-hour benchmark in the PRC since October 2023, bringing with it numerous cheaper BEV models than their ICE model counterparts.[10]

Figure 2. Lithium carbonate price



Source: Trading Economics

[7] https://about.bnef.com/blog/lithium-ion-battery-pack-prices-see-largest-drop-since-2017-falling-to-115-per-kilowatt-hour-bloombergnef/

[8] Lithium carbonate is one of the core raw materials for lithium iron phosphate (LFP) batteries which are widely installed for EVs.

[9] The term "price parity" refers to the point at which an automaker can theoretically build and sell an EV with the same margin as a comparable combustion vehicle, assuming no subsidies are available.

[10] https://evboosters.com/ev-charging-news/electric-vehicles-now-cheaper-than-combustion-models-in-china/

The CAREC region saw an increasing number of EV purchases, mostly imported from the PRC.

Local production or assembly of EVs has made significant progress in several CAREC member countries in 2024, and many more commitments or intentions of this kind are ongoing. Following the announcement by BYD and UzAuto to jointly produce new energy vehicles (NEVs) in 2022, the joint venture company has successfully launched the first batch of NEVs (Song Plus DM-I Champion Edition) at its Uzbekistan factory in mid-June 2024, marking a milestone for fulfilling its annual production capacity of 50,000 units in the first phase.[11] In Pakistan, in collaboration with their international partners such as MG Motors, Seres, Changan and Eco-Green Motors, several local auto companies including JW-SEZ, Regal Automobiles, Master Motors and Dewan Farooque Motors Limited (DFML) have assembled a multitude of EV models.[12][13][14][15] In Kazakhstan, passenger EV brands such as JAC iEV7S and KIA EV6 have been delivered in batches.[16] In addition, more EV manufacturers, Chinese ones in particular, are entering the CAREC markets and plan to set up local factories to promote EV production. Recent examples include ZEEKR's entry to Georgia[17] and Kazakhstan[18] to market its all-electric sustainable luxury vehicles, ROX Motor's presence in Kazakhstan to sell its premium NEV SUVs[19], NIO's expansion to Azerbaijan to provide intelligent EV products and services[20], Neta Motors's intention to enter the Kyrgyz Republic to manufacture its four and three-wheeled EVs[21], BYD's official operations in Kazakhstan[22] and Tajikistan[23] and the company's announcement to establish EV plants in Azerbaijan[24] and Pakistan[25], among many others.

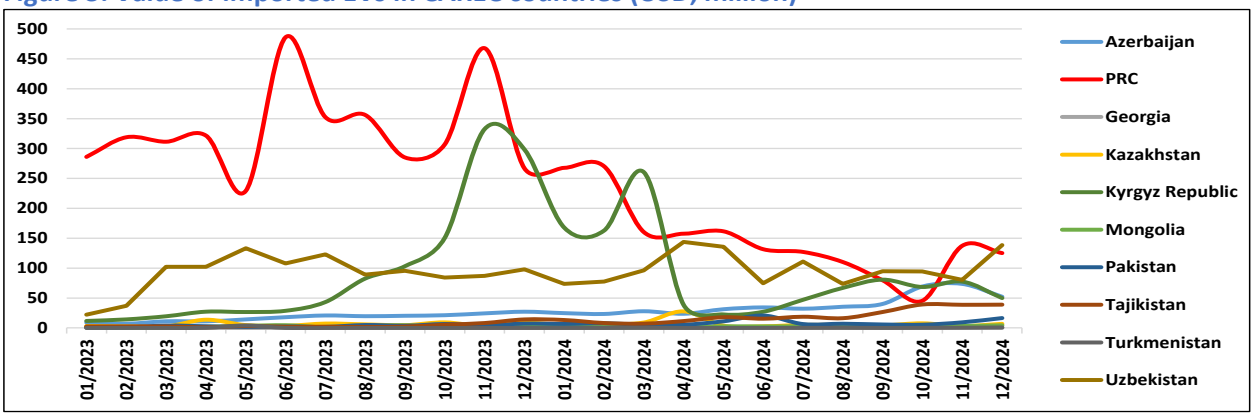
Despite the momentum of local production of EVs, all CAREC countries except for the PRC are still heavily dependent on EV imports, with divergent pictures though. In 2024, the total value of imported EVs by the CAREC countries amounted to USD 4.98 billion, 1.6 billion less or 24.5% lower than that in 2023 (Figure 3). However, this was mostly driven by the PRC where the import value in USD terms shrank by 55% to only around USD 1.8 billion as compared to the previous year. Net of the PRC, the region imported EVs worth USD 599 million more or 23.0% higher in 2024 than the year before. According to the data released by China Automobile Dealers Association, the sales of imported NEVs in the PRC fell by 47.1% yoy from 45,993 units in 2023 to 24,317 units in 2024, of which the sales of imported BEVs were down by 45.7%, and PHEVs by 49.0%.[26] The rise of domestic EV brands and the acceleration of local production of international EV models could be the reasons for the country's weakened EV imports. Likewise, Turkmenistan's total value of imported EVs also contracted by some 56% in 2024 compared to

[11] https://carnewschina.com/2024/06/28/byd-first-batch-mass-produced-vehicles-rolled-off-assembly-line-in-uzbekistan-factory/
[12] https://www.app.com.pk/global/chinas-largest-automobile-maker-comes-to-pakistans-private-sez/
[13] https://profit.pakistantoday.com.pk/2024/10/08/regal-automobiles-launches-pakistans-first-electric-suv/
[14] https://www.fmworld.pk/master-changan-plans-to-accelerate-pakistans-mass-ev-adoption-with-deepal/
[15] https://profit.pakistantoday.com.pk/2024/12/05/deewan-farooq-motors-assembles-over-100-evs/
[16] https://astanatimes.com/2023/08/kazakhstan-to-build-more-electric-charging-stations-by-2029/
[17] https://www.zeekrlife.com/ka-ge/posts/zeekr-electrifies-georgia-tegeta-cars-becomes-official-distributor
[18] https://carnewschina.com/2023/08/07/zeekr-launched-in-kazakhstan-sales-will-start-in-november/
[19] https://www.bitauto.com/en-ae/news/100196873759.html
[20] https://azertag.az/en/xeber/strategic_cooperation_agreement_signed_between_nio_automobile_company_and_green_car_llc-3285848
[21] https://24.kg/english/307098_Chinese_electric_vehicle_company_intends_to_enter_Kyrgyzstans_market/
[22] https://cnevpost.com/2025/03/04/byd-enters-kazakhstan/
[23] https://autocango.com/news-detail/byd-launches-in-tajikistan-with-ev-models
[24] https://mincom.gov.az/en/media-en/news/document-on-e-bus-manufacturing-localization-signed-with-byd
[25] https://www.dawn.com/news/1852926
[26] https://www.cada.cn/Data/info_87_10127.html (author's translation)

the year before, but this didn't starkly impact the aggregated value of the whole region as the share of its EV imports against most other member countries was rather small. Just one month before the newly built "smart" and "green" city of Arkadag was inaugurated in June 2023, the country imported 10 battery electric buses from the PRC with the total value worth more than USD 4 million, making it the largest purchase amount in its EV procurement history. Nevertheless, increasing EV adoption would help Turkmenistan to lessen the environmental impact given the country bears one of the highest transport emissions per capita (1.70 tCO2e/person) in the region.[27]

The Kyrgyz Republic also saw some decline in imports of EVs, not substantially though. Specifically, the amount of EVs imported in USD terms in the Kyrgyz Republic in 2024 was 69 million less or 6% lower than that in 2023, albeit still with a rather high total value. The decrease was mainly a result of less demand from Russia as the country introduced an additional utilization fee (also known as "recycling fee") starting from 1 April 2024, reportedly aimed at counteracting the gap where citizens and companies importing cars previously cleared in the customs of other EAEU countries paid less than they should have paid when cars were cleared at the borders of the Russian Federation.[28] According to the General Administration of Customs of the PRC[29], the number of EVs exported to the Kyrgyz Republic plummeted from 12,174 units in the first quarter of 2024 to only 2,124 units in the second quarter, but then rebounded to 4,750 and 5,694 units in the third and fourth quarter, respectively. It was worth noting that the Kyrgyz Republic was once a main "transit corridor" for vehicle re-exports to other countries, Russia in particular[30].

Figure 3. Value of imported EVs in CAREC countries (USD, million)



Note: Mirror data for the Kyrgyz Republic, Tajikistan, Turkmenistan and Uzbekistan.
Source: Trade Map; author's calculations.

The value of imported EVs increased in the rest of the CAREC countries in 2024, in some of them significantly. The highest annual growth was in Tajikistan where the value of imported EVs skyrocketed by 421.7% to USD 252 million in 2024, from a low level of USD 48 million in 2023. According to the data from Customs Service of Tajikistan, the country imported around 8,800 units of EVs in 2024, which was 5,400 units more than that were imported in 2023.[31] Georgia recorded the second highest growth of

[27] Ibid (see footnote 3)
[28] https://timesca.com/kyrgyz-re-exporters-of-chinese-cars-will-soon-pay-higher-duties/
[29] The Kyrgyz Republic imports EVs mostly from the PRC.
[30] https://24.kg/english/279542_Kyrgyzstan_among_leaders_in_car_exports_to_Russia/
[31] https://avesta.tj/2024/12/07/v-tadzhikistan-importirovano-8-8-tys-elektromobilej-v-2024-godu/

213.5% in EV imports among all CAREC countries with the value up from USD 282 thousand in 2023 to USD 884 thousand in 2024. However, the accumulative value of EVs imported by the country was the lowest among the CAREC member countries[32]. From January to November 2024, the country was reported to have imported 4,711 units of EVs worth 91.5 million US dollars.[33] Azerbaijan's and Pakistan's growth of EV imports were not extraordinarily high in 2024 but still as decent as 128.5% yoy and 173.4% yoy, respectively. By contrast, the value of imported EVs in Kazakhstan, Mongolia and Uzbekistan grew more moderately by a respective increase of 25.0%, 21.8% and 10.4% yoy in 2024. Despite this, Uzbekistan was the largest EV importers among all the CAREC countries except for the PRC. According to data from the Statistics Agency of Uzbekistan, the country imported a total number of 24,095 units of EVs in 2024, which was over 8,000 more than that were imported in 2023.[34] Meanwhile, Kazakhstan's recent plan to elevate the ceiling on gasoline prices will probably further boost the country's EV adoption in the future (Box 1).

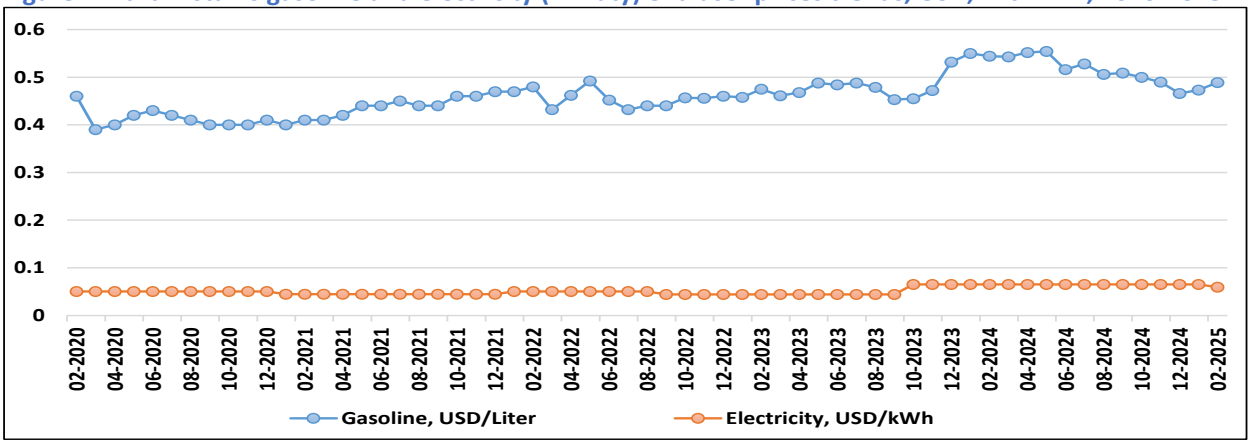
Box 1: Electricity tariffs and gasoline prices trends and their influence on the EVs adoption process — A case study of Kazakhstan

(Contributed by Dr. Vladislav Zavadskiy, Senior Research Specialist at the CAREC Institute)

Gasoline prices in Kazakhstan have traditionally been low compared to global standards. This creates certain difficulties for EV sales, since the owners of gasoline cars may not see the economic benefit of switching to electric transport. However, in recent years, there has been a trend towards increasing gasoline prices, which may change the situation.

Over a period of five years, the cost of gasoline in Kazakhstan has not undergone significant changes in USD terms. However, there were some fluctuations. So, the minimum cost for the recent five-year period was in March 2020 and amounted to USD 0.39, and the maximum was in May 2024 and amounted to USD 0.554 (Figure 4).[35]

Figure 4. Kazakhstan's gasoline and electricity (Almaty) end user prices trends, USD, with VAT, 2020-2025



Source: Ministry of Energy of the Republic of the Kazakhstan, various sources

[32] Afghanistan is not included in this brief as the total value of EV imports is very limited and not comparable to other CAREC economies. In 2023-24, the country only imported a total value of USD 39 thousand (mirror data) EVs, mainly from the US.
[33] https://georgiatoday.ge/georgias-electric-gamble-how-a-small-nation-became-a-silent-power-in-the-global-ev-trade/
[34] https://www.uzdaily.uz/en/uzbekistan-imports-over-24000-electric-vehicles-in-2024/
[35] https://www.gov.kz/memleket/entities/energo (author's translation)

The situation is somewhat different from the perspective of changing gasoline prices in national currency[36]. For example, the cost of a liter of gasoline was 174 KZT in February 2020, while it was already 253.5 KZT in February 2025 due to the weakening of the KZT-USD exchange rate, representing a significant increase.

According to the Minister of Energy, Almasadam Satkaliyev, an additional increase in prices for gasoline, diesel fuel and liquefied petroleum gas are to rise further in Kazakhstan from the beginning of February 2025 onwards. The main goal of the price increases is to support the oil processing and oil-producing industries. Currently, Kazakhstan has the lowest gasoline prices in the region, which contributes to an increase in its exports and the creation of a deficit in the country. Harmonization of prices with neighboring countries is predicted, which may lead to an additional increase in gasoline from 40% to 138%.[37]

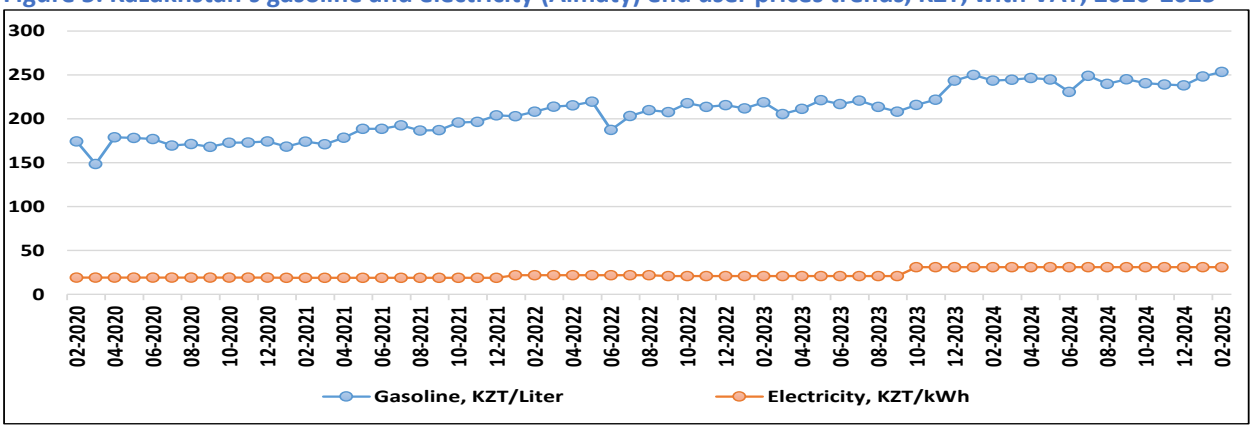
As gasoline prices increase, interest in alternative energy sources, including EVs, is growing. If gasoline prices continue to rise, the operating costs of gasoline cars will become less attractive compared to EVs. This may lead to an increase in demand for EVs, especially if the government offers additional incentives for their purchase.

Electricity tariffs play a key role in the economics of using EVs. Today, electricity tariffs in Kazakhstan remain relatively low, which makes the operation of EVs more profitable compared to gasoline analogues. According to Global Petrol Prices, among the 147 countries included in the monitoring, Kazakhstan ranks the 24th, with the cost of electricity at USD 0.046 per kWh[38]. If we trace the dynamics of changes in electricity tariffs in Almaty, for consumers of the 1st group (Figure 5) during the five-year period under review, we can conclude that in USD and KZT terms it changed insignificantly. There were several stages of changing tariffs. So, in February 2020, the cost of electricity was USD 0.05 (KZT 19.17)[39], in January 2021 – USD 0.044 (KZT 18.88)[40], in January 2022 – USD 0.05 (KZT 21.82)[41], in September 2022 – USD 0.044 (KZT 20.78)[42], in October 2023 – USD 0.065 (KZT 30.9)[43] and in February 2025 – USD 0.059 (KZT 30.9). Fluctuations in the cost of electricity in dollar terms are also due to fluctuations in the exchange rate of the national currency.[44]

On average, electricity tariffs in Kazakhstan are increased once a year. In 2025, the expected growth may reach 20%.[45]

[36] https://nationalbank.kz/ru/exchangerates/ezhednevnye-oficialnye-rynochnye-kursy-valyut/graph?beginDate=02.02.2020&endDate=20.02.2020&search-exchanges=&rates%5B%5D=5 (author's translation)
[37] https://kz.kursiv.media/2025-01-28/zhnb-benzkzpriceup/ (author's translation)
[38] https://www.globalpetrolprices.com/
[39] https://www.zakon.kz/redaktsiia-zakonkz/5006322-novye-tarify-na-kommunalnye-uslugi.html
[40] https://kazlenta.kz/93780-predelnye-tarify-na-elektroenergiyu-planiruyut-izmenit-s-1-fevralya-2025.html
[41] https://www.inform.kz/ru/tarify-na-elektroenergiyu-vyrosli-v-almaty_a3977190
[42] https://gkhsp.kz/too-almatyenergosbyt-informiruet-o-povyshenii-czen-na-elektroenergiyu/
[43] https://www.inalmaty.kz/news/3843518/tarify-na-elektroenergiu-vyrastut-v-almaty-kogda-i-na-skolko
[44] https://nationalbank.kz/ru/exchangerates/ezhednevnye-oficialnye-rynochnye-kursy-valyut/graph?beginDate=02.02.2020&endDate=20.02.2020&search-exchanges=&rates%5B%5D=5
[45] https://eadaily.com/ru/news/2025/02/27/rost-tarifov-na-elektroenergiyu-v-kazahstane-neizbezhen-minenergo

Figure 5. Kazakhstan's gasoline and electricity (Almaty) end user prices trends, KZT, with VAT, 2020-2025



Source: Ministry of Energy of the Republic of the Kazakhstan, various sources

According to the comparison of the cost of ownership of electric vehicles and gasoline engine vehicles, the cost of driving an electric car in Kazakhstan is 2.7 times lower than driving a gasoline car (Table 1).[46]

Table 1. Comparison of the cost of owning an electric car with a gasoline engine car in Kazakhstan

	Gasoline engine (volume 2.5 L)	Electric car
Annual costs based on mileage of 20,000 km	381 300 KZT (gasoline cast AI92 – 205 KZT, fuel consumption – 9.3 L/100 km)	170 000 KZT (55 000 KZT home charging)
Annual tax	24 200 KZT	0 KZT
Engine oil changes every 8000 km	62 500 KZT	0 KZT
Total basic expenses	468 000 KZT	170 000 KZT or 55 000 KZT

Source: Ministry of Energy of the Republic of the Kazakhstan, official website of the Toyota representative office in Kazakhstan, various sources

In 2023, in Kazakhstan, the cost of each kilometer of travel on an electric car with a range of 500 km, a capacity of 350 kW and a battery capacity of 85 kWh (Tesla) is 8.5 tenge (in the urban cycle).

But if electricity tariffs increase, the cost of charging EVs will increase, which may negatively affect their attractiveness. Nevertheless, from the point of view of tariffs for electricity, the operation of EVs in Kazakhstan looks very attractive. The price of electricity remains low, more predictable, compared to the gasoline prices.

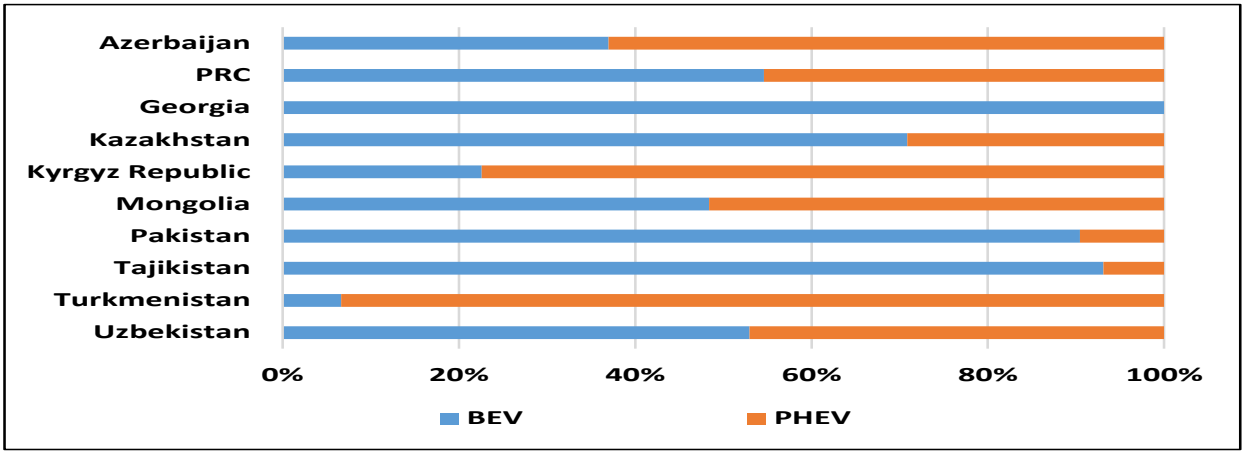
Therefore, to stimulate the electric vehicle market, it is necessary to ensure stability and predictability of electricity tariffs. In addition, the introduction of special tariffs for owners of EVs at night can become an additional incentive for their use.

The influence of trends in electricity tariffs and gasoline prices in Kazakhstan is an important factor determining the development of the EV market. With rising gasoline prices and stable electricity tariffs, interest in EVs will increase. However, to achieve sustainable growth, it is necessary to create the appropriate infrastructure and further strengthen government support.

[46] https://digitalbusiness.kz/2023-07-31/stoimost-ezdy-na-elektromobile-v-kazahstane/

The majority of the CAREC countries imported more BEVs than PHEVs in 2024. All EVs imported by Georgia measured by value in USD terms in 2024 were the ones with only an electric motor for propulsion, including passenger cars and buses. In Pakistan and Tajikistan, the share of imported BEVs was as high as 90% and 93%, respectively (Figure 6). In the PRC, Kazakhstan and Uzbekistan, the share was more than 50%. By contrast, Azerbaijan, the Kyrgyz Republic, Mongolia and Turkmenistan imported more PHEVs than BEVs by USD terms. In 2024, the value share of imported PHEVs of these countries including spark and compression-ignition chargeable cars in total EV imports was 63%, 77%, 52% and 93%, respectively.

Figure 6. Share of EV imports by type, 2024 (%, based on the monetary value in USD)

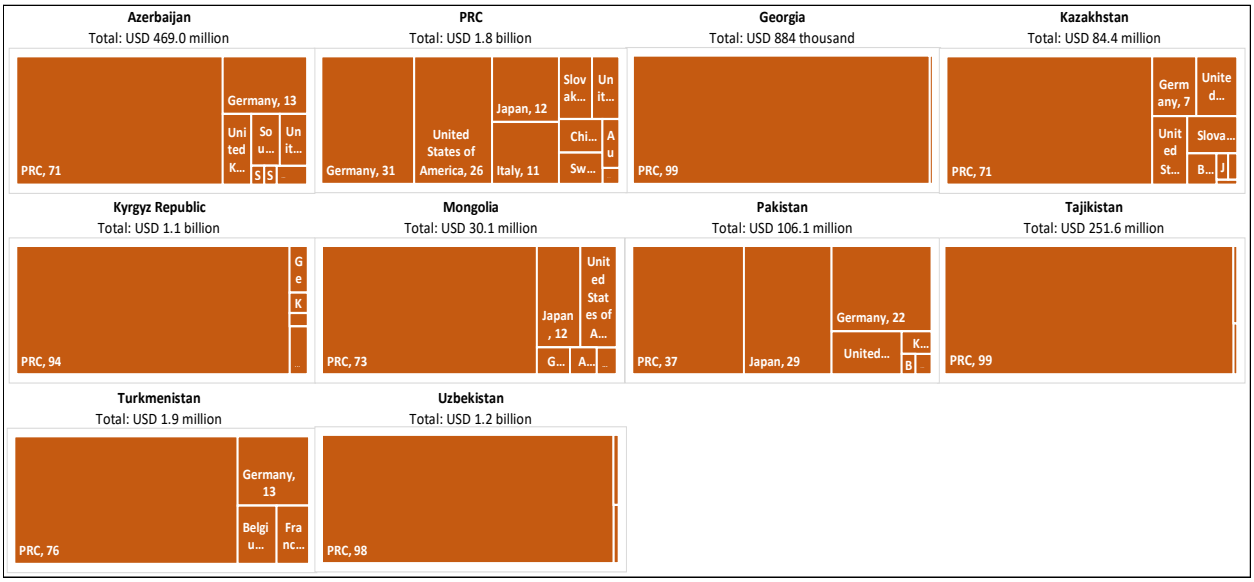


Note: Mirror data for the Kyrgyz Republic, Tajikistan and Turkmenistan.
Source: Trademap; author's calculations.

The PRC remained the largest source of EV imports for most of the CAREC countries in 2024. Among them, almost all the EV imports (in USD terms) of Georgia[47], Tajikistan and Uzbekistan were from the PRC (Figure 7). Notably, the share of the PRC in Georgia's EV imports increased significantly to 99% in 2024 from 66% in 2023 when the country also imported EVs worth USD 80 thousand from Türkiye. The Kyrgyz Republic also imported most of its EVs from the PRC in 2024. However, the share of the PRC fell by 1% to 94% in 2024 compared to 2023, whilst the share of South Korea, Hungary and Belgium increased to nearly 1%. In Azerbaijan, Kazakhstan, Mongolia and Turkmenistan, the share of their EV imports from the PRC was not as high as the aforementioned countries, but the PRC still dominated their EV import markets. In 2024, in addition to the PRC, Azerbaijan, Kazakhstan and Turkmenistan also imported a slew of EVs from Germany, and Mongolia from Japan. Pakistan's source of EV imports seemed more balanced in 2024, with the value share from the PRC, Japan and Germany between 22%-37%. It was worth noting that the country mainly imported EVs from Belgium in 2022 and before. The PRC, despite being the largest car exporter in the world (Box 2), also imported numerous EVs from outside the country, with a descending tendency though. The top three source countries of the PRC's EV imports were Germany, the US and Japan in the past two years.

[47] However, according to the mirror data shown by its trading partners, the top source of EV imports of Georgia was the US. The country was reported to have imported 2,800 EVs from the US, nearly fourfold more than that were imported from the PRC. The imported EVs from the US were often second-hand and flooded in from auctions. https://georgiatoday.ge/georgias-electric-gamble-how-a-small-nation-became-a-silent-power-in-the-global-ev-trade/

Figure 7. Share of EV imports by CAREC countries' trading partners, 2024



Note: Mirror data for the Kyrgyz Republic, Tajikistan, Turkmenistan and Uzbekistan.
Source: Trade Map; author's calculations.

Box 2: A snapshot of the PRC's NEV exports in 2024

The PRC's total production and sales of NEVs have ranked first in the world for 10 consecutive years. In 2024, the NEV market continued to expand, with the production and sales of NEVs for the first time exceeding 10 million units to around 12.9 million for both, increasing by 34.4% and 35.5% yoy respectively. While NEV sales continued to grow decently by 39.7% yoy domestically, the growth of NEV exports slowed significantly to 6.7% yoy in 2024 from 77.6% yoy in 2023 and an even higher 120.2% yoy in 2022. The EU's decision to raise import tariffs on Chinese NEVs as well as sluggish growth of international markets could be the reasons for the decreased NEV export growth rates.

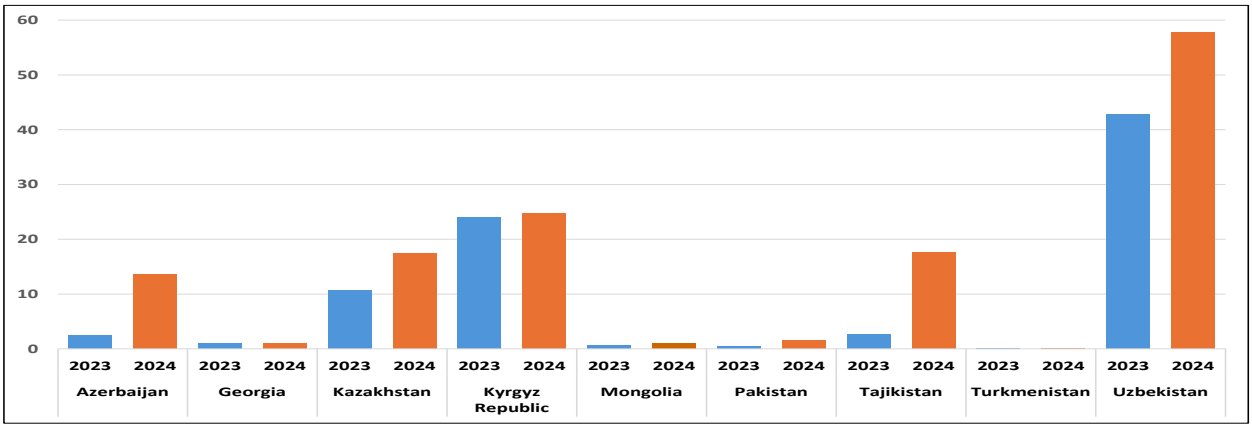
By category, the quantity of exported BEVs decreased by 10.4% yoy to 987 thousand units in 2024. This was less than the peak in 2023 of 1.1 million units, but it was still some 38 thousand units more than that in 2022. In comparison, the scale of exported PHEVs continued to expand from 68 thousand units in 2022 to 101 thousand units in 2023, and further to 297 thousand units in 2024. This was in line with the world trend where the share of PHEVs in global EV sales increased to 37% in 2024 from 28% in 2022 and 31% in 2023.[48] By destination, the largest receiving country of the PRC's NEV exports was again Belgium in 2024, with the number up to 263,743 units, which was far more than other countries. This was followed by Brazil, the UK, Thailand and the Philippines to which the PRC exported 100-150 thousand units of NEVs. Meanwhile, Mexico, India, the UAE, Australia and Isarel also received a substantial number of Chinese NEVs in 2024. Among all countries, Brazil saw the highest growth of the PRC's NEV imports. The country was reported to have exceeded Belgium and became the largest Chinese NEV receiver in several months of 2024.[49]

[48] https://cleantechnica.com/2025/02/05/world-ev-sales-report-17-2-million-plugins-were-sold-in-2024/
[49] https://www.chinadaily.com.cn/a/202405/28/WS665569fea31082fc043c98fc.html

Chinese local NEV brands have been widely acknowledged by consumers around the world. In a ranking list released by CleanTechnica recently, more than 10 Chinese NEV brands were among the top 20 auto brands in the world EV sales in 2024.[50] BYD, the Chinese auto giant, ranked the first with total EV sales exceeding 4 million units globally, which was over twice more than that were sold by Tesla ranking the second. Other Chinese local EV brands on the list include Wuling, Geely, Li Auto, Aion, AITO, Chery, SAIC, Changan, among others.

The number of NEVs exported from the PRC to the CAREC region was still relatively limited, but it increased somehow. According to data from the General Administration of Customs of the PRC, the country exported 134,501 units of BEVs and PHEVs to the CAREC countries in 2024, accounting for 10.5% share of its total NEV exports to the world, which was 3.5 percentage points higher than the share in 2023. Tajikistan, Azerbaijan and Pakistan contributed heavily to the increase. The annual growth of NEV exports from the PRC to the three countries grew by 576.8%, 453.8%, and 298.1% yoy, respectively (Figure 8). In Mongolia and Turkmenistan, the growth was decent at 64.0% and 95.7% yoy, respectively, but increased from a low base. All the other CAREC member countries except for Georgia also saw positive growth, at different magnitudes though. The growth of the PRC's NEV exports to Georgia shrank by 0.8% yoy, with the number of exported NEVs decreasing marginally to 955 units in 2024.

Figure 8. The PRC's NEV exports to the CAREC countries, 2024 (thousand units)



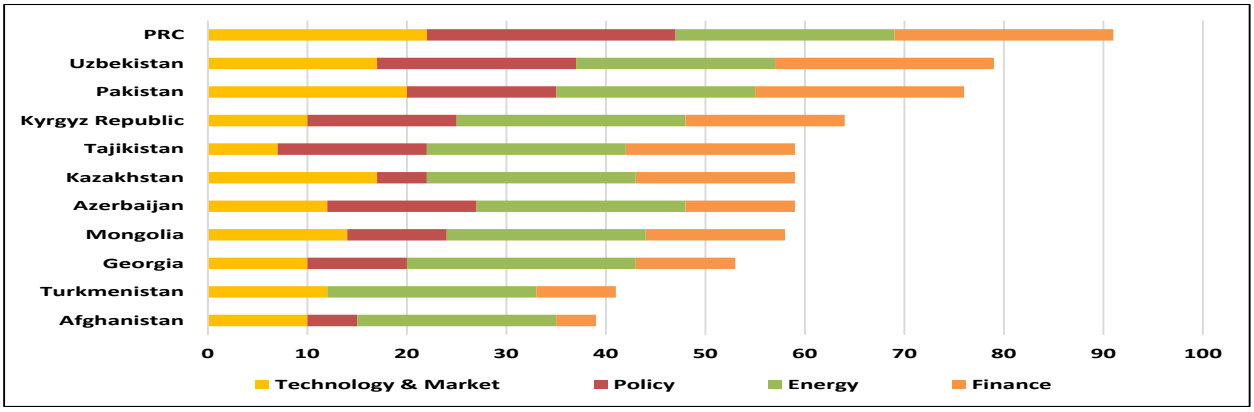
Note: The data were compiled based on HS code 870240, 870360, 870370, 870380.
Source: The General Administration of Customs of the PRC; author's compilations.

EV charging infrastructure: scarce in general, but more support ongoing

Despite increased imports and accelerated local production of EVs, the CAREC countries bore significant disparities in preparing their transition to EVs. The United Nations Environment Programme (UNEP) has created a rating index tailored for the developing countries (global south) to assess how prepared these countries are for their transition to EVs. The index consists of four equally weighted dimensions, namely, Technology and Market, Policy, Energy, and Finance, by examining the factors such as EV supply chain, consumer demand, charging infrastructure, and so forth (Figure 9). Analysis by ADB's Asian Transport Outlook (ATO) revealed that while some CAREC member countries such as the PRC, Uzbekistan and Pakistan have been working proactively to embrace e-mobility, others like Georgia, Turkmenistan and Afghanistan are not yet similarly well equipped for their transition to EVs.

[50] https://cleantechnica.com/2025/02/05/byd-1-in-world-in-plugin-vehicle-sales-in-2023-2/

Figure 9. UNEP E-Mobility Readiness Index[51] , 2024



Source: ADB's ATO analysis of UNEP Index; author's compilations.

Lack of charging infrastructure is one of the key factors that hinder the transition to e-mobility in nearly all the CAREC countries. The Alternative Fuel Infrastructure Directive (AFID) by the EU recommends that the ratio of EVs and public charging stations should stand at 10:1, which means that one public charging station serves ten EVs.[52] In the CAREC region, there is no common standard for the ratio, but as Table 2 shows all member countries except for the PRC are short of charging stations and need massive provision of charging infrastructure to cater to the increasing number of EVs. According to a report by China EV Charging Infrastructure Promotion Alliance (EVCIPA), the PRC's incremental ratio of EVs versus charging points stood already at 2:1 in January 2025.[53]

Table 2. Number of registered EVs and charging stations in the CAREC countries, as of the date

	Azerbaijan	PRC	Georgia	Kazakhstan	Kyrgyz Republic	Mongolia	Pakistan	Tajikistan	Uzbekistan
Number of registered EVs	4,047 (Jul. 2024)	31.4 mln (Dec. 2024)	7,777 (Dec. 2024)	12,587 (Dec. 2024)	2,000 (Oct. 2024)	1,670 (Nov. 2024)	2,600 (Sep. 2024)	1,600 (Aug. 2023)	_
Number of charging stations	195 (Feb. 2025)	12.8 mln* (Dec. 2024)	150* (Dec. 2024)	426 (Dec. 2024)	70 (2023)	70 (Jan. 2024)	11-13 (late 2024)	136 **(Jun. 2024)	1,085 (Dec. 2024)

*The figure here refers to the number of charging points.
**It refers to the number in its capital city - Dushanbe.
Source: Media reports from open resources; author's compilations.

On the other hand, in most member countries charging stations were not utilized at full capacity. In the PRC, for instance, the average time utilization rate[54] of the public charging points was only 11.3% in the thirty-six cities surveyed, and up to 60% of respondents mentioned that they often encountered the situation where charging points were damaged or malfunctioning.[55]

[51] https://asiantransportobservatory.org/searchview/?term=E-mobility%20readiness%20index
[52] https://kr-asia.com/charging-stations-in-2024-expansion-competition-and-regulation-as-key-factors
[53] https://news.cctv.com/2025/02/17/ARTIQGsShdmmQfVn7Qmqu3HI250217.shtml
[54] The average time utilization rate: the ratio of the charging working hours of all public charging points in a station to the total service time available within a day.
[55] https://www.cqn.com.cn/zgzlb/content/2024-12/12/content_9082203.htm (author's translation)

The majority of the CAREC countries have announced targets and rolled out policies (Annex) to accelerate the deployment of the EV infrastructure. During the COP29 period, Azerbaijan unveiled its "National Electric Mobility Plan" in which two phases (the 1st phase: 2024-27; the 2nd phase: beyond 2027) were designed to promote e-mobility, including developing the basic EV infrastructure.[56] The PRC targets to build a high-quality charging infrastructure network with extensive coverage, moderate scale, sound structure, and full functions by 2030.[57] In other member countries such as Georgia, Mongolia, Pakistan, Tajikistan and Uzbekistan, the planned number of charging stations to be built was announced, for different time periods though. To fulfill the targets or the ambitions, respective governments introduced various incentives, including the provision of subsidies, exemption of import tariffs for chargers, reduction of electricity tariff for charging stations, among others.

Conclusion, limitations, and future research directions

As the world is shifting from a resource-dependent society to a technology-driven community, decarbonization has become a new orientation for the world economy. The application of EV technology, as IEA estimates, together with solar photovoltaic power can contribute as much as one third of carbon reduction worldwide by 2030. Analogous to many other countries in the world, the CAREC members have shown a strong passion to embrace the movement towards EVs. In 2024, the region (excluding the PRC) saw the largest imports of EVs in history. Meanwhile, more and more foreign auto makers entered the indigenous markets, expanded their businesses, and started locally producing or assembling EVs. Accordingly, governments of respective countries actively launched or optimized their policies to boost the deployment of EV infrastructure.

With the presence of more EVs on road, the CAREC countries should form a sustainable EV charging ecosystem in which power utilities are profoundly integrated with the charging infrastructure to ensure that the EV drivers will not feel “charging anxiety”. This calls not only for accelerated buildout of more charging stations, but it also requires adequate soft infrastructure that is able to offer EV drivers satisfactory charging experience. All CAREC countries except for the PRC are currently still at a rather nascent stage in deploying EV infrastructure with some of them owning less than 100 charging stations nationwide, which significantly deviates from the ideal expectation that the number of charging equipment should go proportionately with the increasing number of EVs. While we saw member countries’ ambitions to ramp up the provision of EV charging infrastructure, a multifaceted approach should be adopted. This includes rolling out a robust regulatory framework at the national level to guide relevant stakeholders for the implementation of their work, upgrading the current grid networks to meet the increasing charging demand, offering incentives to bring more private capital to participate in infrastructure construction, developing information sharing platforms to facilitate the charging process, cultivating maintenance professionals to ensure sustainability of the infrastructure, among others.

Limitations and future research directions

The most notable limitation for this research lies in the absence of EV data for some countries. To cover as many CAREC countries as possible, the author employed their trade partners’ reported data (also

[56] https://www.azernews.az/business/232727.html
[57] https://www.gov.cn/yaowen/liebiao/202306/content_6887196.htm?eqid=ff8456fb000c2d4700000003649101cb (author’s translation)

known as “mirror data”) as a complement. However, this may, at the same time, lead to an issue with data accuracy where the actual amount of EV imports by the home country may significantly deviate from what was reported by their counterparties. The other limitation consists in the ambiguity of EV and infrastructure definitions among different countries. Although the author used most of the data directly or indirectly from the customs agencies where EV types could be easily differentiated based on their respective codes, there was still a lot of information that was referenced from public media reports where only a generic word of “EV” was used and it is unknown whether the conventional hybrids, for example, was included or not.[58] Meanwhile, the naming of EV infrastructure may vary between countries. For example, a “charging station” in the PRC is called a “recharging pool”[59] in the EU. It was unclear what naming approach of EV infrastructure the CAREC countries adopted.

While many CAREC countries have introduced policy incentives to promote the development of their EV industry and while more EV makers have entered or at least showed their intention to penetrate the CAREC markets, local people’s perceptions towards EVs may conversely affect the governments’ and automakers’ decisions. Hence, investigating and assessing consumers’ car-buying behavior is of high importance for a country’s e-mobility transition. Currently, there are quite a few automobile consumer survey reports available in the market, but many of them, such as EY’s Mobility Consumer Index and Deloitte’s Global Automotive Consumer Study, present only a global perspective. Targeted reports for the CAREC countries (except for the PRC) are rare to find. Future research for this region may involve also demand-driven factors, taking consumer’s needs into account. A good understanding of potential EV buyers could help to shape a better EV industry for the country.

[58] In many cases, traditional hybrid electric vehicles were excluded from the EV fleet while reporting.
[59] A recharging pool can contain several recharging stations, recharging points and connectors. https://alternative-fuels-observatory.ec.europa.eu/general-information/recharging-systems

Annex: Targets and policy incentives for EV infrastructure development in the CAREC region

	National EV charging infrastructure target/ambition	Policy incentives	Main document /Event	Year
Azerbaijan	Develop the basic infrastructure for electromobility and prepare the normative-legal framework during 2024-27; develop the e-mobility and energy charging infrastructure market in collaboration with the private sector beyond 2027.	Extend the VAT exemption period for the import and sale of second and third-level EV chargers for another 2 years until 1 January 2027.	National Electric Mobility Plan	2024
PRC	Form a charging infrastructure system that can meet the charging needs of over 20 million EVs by the end of the 14th Five Year Plan; keep the coverage rate of fast charging stations in key areas not less than 80%, and in other areas not less than 60% by 2025; establish a high-quality charging infrastructure network with extensive coverage, moderate scale, sound structure, and full functions by 2030.	Provide subsidies for establishing and operating charging infrastructure; exempt electricity demand (capacity) charges for the centralized charging and swapping facilities that implement a two-part electricity pricing system.	Implementation Opinions on Further Improving the Service Guarantee Capability of Electric Vehicle Charging Infrastructure; Guiding Opinions on Further Building the High-quality Charging Infrastructure Network	2022, 2023
Georgia	Install an additional 200 EV chargers throughout Tbilisi.		Municipal government meeting	2025
Kazakhstan	Increase the output value of NEVs and charging equipment to 10 billion US dollars by 2025.	Exempt VAT for charging points.	National Strategy for Industrial Innovation and Development 2025	
Kyrgyz Republic		Simplify the procedure for		

		operating and installing chargers for EVs.		
Mongolia	Build EV charging stations in 25 locations in Ulaanbaatar; establish a network of 1,000 charging stations.		Action Plan to Increase the Use of Electric Vehicles	2024
Pakistan	Install at least one DC fast charger in each major city in every 3x3 km area; install DC fast chargers along major motorways and highways after every 15-30 km; ensure uninterrupted power on feeders for charging stations; establish 3,000 EV charging stations by 2030.	Impose only 1% import duty on charging equipment; reduce the electricity tariff for charging stations by 45%, lowering it from Rs71.10 to Rs39.70.	National Electric Vehicle Policy; Electric Vehicles (EV) Policy for 2025-2030	2019, 2024
Tajikistan	Create high-capacity charging infrastructure (over 22 kW, up to 80% in 20-30 minutes) - at least 40 units; create a medium-capacity charging infrastructure (up to 22 kW, up to 80% within 2-10 hours) - at least 850 units.		Development Plan of E-mobility in the Republic of Tajikistan from 2023 to 2028	2022
Uzbekistan	Install 32,400 electric charging stations by the end of 2025. In 2025, 21,548 charging stations are planned to be installed in parking lots, gas stations, shopping and business centers, social facilities, government agencies, etc.	Exempt land and property tax for legal entities, income tax for business entities from 1 January 2023 to 1 January 2026 whose main activity is providing vehicle charging services, and import tariffs on technical equipment for charging stations.	Measures to Expand the Infrastructure for Electric Vehicle Operation	2022, 2024

Note: The targets and incentives above are non-exhaustive information based on data availability.
Source: Media reports from open resources, government documents; author's compilations.