Think Visegrad
V4 Think-Tank Platform

POLICY BRIEF

2019/December
Think Visegrad in Brussels

How electromobility can drive Visegrad cooperation

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EU's ambitious climate policy will impact all industry sectors, including transport, and electric vehicles will play a central role in decarbonizing it. These changes should be considered by the V4 – countries with strong automotive industry and 13% of EU's registered passenger cars. While the development of electromobility will be challenging, if included properly in V4 agenda, it might fuel cooperation and be used in V4's foreign policy

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The role of EVs in EU's decarbonization plan

Climate policy is becoming a more important part of the international agenda: the Paris Agreement, underwritten by almost all countries, is a sign of it. EU policy is even more ambitious and climate policy will be one of the top priorities of the new EC, which presented the "European Green Deal". Decarbonisation of the road transport, responsible for a significant portion of greenhouse gases (GHG) emissions, will be the key issue. So far, it was addressed, but the pace of the reductions was low: between 2005 and 2017, the EU managed to lower its total GHG emissions by 16%, but the figure for road transport was just 2%. In 2017, road transport was responsible for 20% of EU's total GHG (passenger cars for 12%)[1].

Numerous measures have been taken to tackle this issue. The 2014/94/EU directive required member states to develop a network for alternative fuels: electric vehicles (EVs), charging points and natural gas stations[2]. EU members should also meet the goal of at least 10% share of renewable fuels in transport by 2020[3]. On top of that, the EU introduced requirements for new cars emissions. Since 2015 the limit has been 130 g CO2 / km[4] for passenger cars, as of 2021 it will be increased to-95 g[5] and will be even stricter in the future[6]. This figure is lower than the average emissions by cars in member states with the lowest average emissions (Malta, Portugal: 106 g)[7] and lower than average for diesel and petrol cars. The EC relies on the technological neutrality principle; however, these ambitious norms make it difficult for traditional combustion engines to meet the limits[8]. Some producers, like Volkswagen, bet on EVs[9] and the European Automobile Manufacturers Association (ACEA) believes EVs should

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[1] *Energy datasheets: EU28 countries*, European Commission, 8 October 2019, https://data.europa.eu/euodp/en/data/dataset/information-on-energy-markets-in-eu-countries-with-national-energy-profiles

[2] B. Bieliszczuk, M. Wąsiński, *Energy transition and climate policy between the three seas, 1988-2018*, The Polish Institute of International Affairs, November 2018.

[3] *Renewable energy directive*, European Commission, 16 July 2014, https://ec.europa.eu/energy/en/topics/renewable-energy/renewable-energy-directive/overview

[4] For the future reference only the number of grams will be listed.

[5] *Reducing CO2 emissions from passenger cars*, European Commission, https://ec.europa.eu/clima/policies/transport/vehicles/cars_en.

[6] *Regulation (EU) 2019/631 of the European Parliament and of the Council*, Official Journal of the European Union, 25 April 2019, https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32019R0631&from=EN

[7] *Making the Transition to Zero-Emission Mobility. 2019 Progress Report*. September, ACEA. https://www.acea.be/uploads/publications/ACEA_progress_report_2019.pdf

[8] There are initiatives to use non-pollutant hydrogen for transport ("combustion engine decarbonisation"). However, the development of hydrogen mobility also encounters many challenges and obstacles, which are not in the scope of this paper.

[9] *From the well to the wheel*, Volkswagen, https://www.volkswagenag.com/en/news/stories/2019/04/from-the-well-to-the-wheel.html.

be part of the transport decarbonization strategy[10]. According to the International Energy Agency forecast, EVs will account for 26-50% of EU's new car sales in 2030[11].

This shift will impact both industrial and foreign policy. Automotive industry accounts for 7% of EU's GDP and (considering direct and indirect jobs) 6.1% of EU's employment (13.8 million)[12]. The growing market share of EVs will entail increased electricity demand, necessity to improve access to charging stations and the expansion of renewable energy sources (RES). At the same time, competition from Asian and U.S. car and battery makers is already pushing the EU to funnel billions into developing European battery technology and securing the supply of raw materials.

Automotive industry and e-mobility: V4's state of play

The above trends will also impact V4, where 3.5 million cars were produced in 2017 (18% of EU's production)[13]. In 2016, the manufacturing of motor vehicles, trailers and semi-trailers accounted for 37.4% of industrial exports of Czechia, 32.6% of Hungary, 21.3% of Poland and 42.9% of Slovakia. In Poland alone the industry is responsible for more than 314 thousand jobs and the figure for the entire V4 group is around 700 thousand[14].

V4 countries are also an important market for passenger cars. More than 35 million of them are registered there – 13% of EU's 267.8 million fleet. In 2018, almost 1 million from EU's 15 million new registrations of passenger cars were in V4 states. Compared to EU's average, the V4 noted a dynamic increase in passenger fleet[15]: Czechia: 3.8%; Hungary: 4.9%; Poland: 4.1%; Slovakia: 4.4%, while EU the average stood at 1.9%, with only 4 EU member states above V4's average growth[16]. On the other hand, electric

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[10] *Joint Call to Action for the Accelerated Deployment of Smart Charging Infrastructure for Electric Vehicles*, ACEA, 4 September, https://www.acea.be/uploads/press_releases_files/Joint_call_to_action-ACEA_Eurelectric_TE.pdf.

[11] *Global EV Outlook 2019*, IEA, May 2019, https://www.iea.org/reports/global-ev-outlook-2019, p. 15-16.

[12] *Auto industry remains the backbone of the European economy, new Pocket Guide confirms*, ACEA, 28 June 2019, https://www.acea.be/news/article/auto-industry-remains-the-backbone-of-the-european-economy-new-pocket-guide

[13] *The automotive industry in the Visegrad Group countries*, Polish Economic Institute, August 2019, http://pie.net.pl/wp-content/uploads/2019/08/PIE-Raport_Automotive.pdf, p. 5.

[14] *The automotive industry in the Visegrad*, p. 6.

[15] Data for 2018, year on year comparison.

[16] *Vehicles in use. Europe 2019*, ACEA, 2019, https://www.acea.be/uploads/publications/ACEA_Report_Vehicles_in_use-Europe_2019.pdf, p. 3.

passenger vehicles (battery electric cars – BEV; hybrid electric cars – HEV; plug-in hybrid cars - PHEV[17]) comprise only a small share of the total passenger car fleet[18].

The V4 is not the frontrunner in limiting transport emissions. While the total GHG emission by Czechia, Hungary and Slovakia decreased by 13-16% between 2005 and 2017 (for Poland it remained at roughly the same level; EU's average: 16%), emissions in road transport actually increased: in Czechia: 8%; Hungary: 10%; Poland: 77%; Slovakia: 16%[19].The V4 also tops the EU when it comes to pollution caused by new cars. In 2018, the V4 average was 127.4 g, while EU's was 120.6[20]. The trend is associated with the rise of petroleum car sales[21]. The relatively old age of passenger cars is another factor. In 2018, the average age of passenger cars in Czechia was 14.8; Hungary 14.2; 13.9 in Poland and Slovakia[22]. However, the V4 members do aim to develop e-mobility, which is reflected in their strategic documents. Their goals are presented in the table below:

Table 1 – V4 countries goals for ECV number[23]

	ECV fleet[24]	Goal for 2030
Czechia	2,667	200,647[25]
Hungary	3,745	450,000
Poland	3,036	600,000
Slovakia	1,036	35,000
V4 total	10,484	1,285,647

[17] For the future reference: BEV – battery electric vehicle, "fully electric" vehicle with electric engine charged from the electric grid; HEV – hybrid electric vehicle, using both combustion and electric engine. Its battery is not charged from outside (grid) but by the electricity generated by traditional engine and/or braking; PHEV – plug-in hybrid vehicle – HEV that can be charged from the grid. Despite their names, all the above vehicles use batteries, which, in case of BEV, must have greater capacity. ECV - electrically-chargeable vehicles includes BEVs and PHEVs.

[18] *Vehicles in use…*

[19] *Energy datasheets…*

[20] *Making the Transition…*, p. 13-14.

[21] *Making the Transition…*, p. 10-11.

[22] *Vehicles in use…*

[23] *Draft National Energy and Climate Plan of the Czech Republic*, December 2018, https://ec.europa.eu/energy/sites/ener/files/documents/ec_courtesy_translation_cz_necp_0.pdf; *Draft National Energy and Climate Plan of Hungary*, 2018, https://ec.europa.eu/energy/sites/ener/files/documents/ec_courtesy_translation_hu_necp.pdf; *Draft Strategy for Sustainable Transport Development until 2030, Polish Ministry of Infrastructure*, September 2019, https://www.gov.pl/web/infrastruktura/projekt-strategii-zrownowazonego-rozwoju-transportu-do-2030-roku2; *Akcneno Planu Rozvoja Elektromobility Vslovenskej Republike*, Slovakia's Ministry of Economy, February 2019, https://www.economy.gov.sk/uploads/files/5wuw3LIe.pdf

[24] As of the end of 2018. Author's own calculations based on: European Alternative Fuels Observatory, https://www.eafo.eu; *New passenger car registrations by fuel type in the European Union, Quarter 4 2018*, ACEA, February 2019, https://www.acea.be/uploads/press_releases_files/20190207_PRPC_fuel_Q4_2018_FINAL.pdf

[25] As per medium scenario form Czechia's strategy.

Author's own calculations, see the sources below

This means that V4 countries plan to have almost 1.3 million EVs (BEVs and PHEVs) by 2030. The target is very ambitious as the current number is less than 100,000, and Poland, Slovakia and Czechia rank in the top 5 among EU states with the lowest market share of EVs[26]. Most probably this results from the lack of proper infrastructure for EVs and their cost: EVs are currently more expensive to buy and own than new "traditional" cars (with batteries making more than 30% of the price)[27], but the gap is closing[28].

As for the infrastructure, there are currently 144,00 charging points in the EU, which means the average per country is over 5,100[29]. In the Visegrad countries there are around 2,500 charging points in total: in Czechia: 558; Poland: 836; Slovakia: 507, Hungary: 595[30]. These numbers are not high; however, it should be noted that only four EU countries (Netherlands, Germany, France, and UK) account for 76% of EU's ECV charging points. ACEA holds that the EVs expansion is correlated with GDP per capita of the country. More than 80% of all ECVs are sold in 6 EU countries with some of the highest GDP per capita[31].

While the majority of EU states (as per data from May 2019) offer tax benefits and incentives[32] to buy EVs, the best deals can be found among the richest countries where consumers also enjoy higher GDP per capita and better access to charging stations. V4 governments are not generous with incentives for purchasing EVs and extension of lower tax benefits[33].

Such disparity may push V4 drivers to import used petroleum cars instead of paying more for new ECVs. Since EVs are becoming more popular in the West, this trend may grow stronger. The average age of a passenger car in V4 is 14.2 years, while in the EU it is 10.8, in Germany – 9.5[34]. The sale of used petroleum cars to less affluent

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[26] *Making the Transition…*, p. 12

[27] Y. Baik, R. Hensley, S. Knupfer, *Making electric vehicles profitable*, McKinsey & Company, March 2019, https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/making-electric-vehicles-profitable

[28] *New market. New entrants. New challenges. Battery Electric Vehicles*, Deloitte, 2019, p. 2, https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/manufacturing/deloitte-uk-battery-electric-vehicles.pdf

[29] *Interactive map: Correlation between electric car sales and availability of charging points*, ACEA, 12 July 2019, https://www.acea.be/statistics/article/interactive-map-correlation-between-electric-car-sales-and-the-availability

[30] *Interactive map…*

[31] *Making the Transition…*, p. 12.

[32] *Making the Transition…*, p. 13-14.

[33] *Electric Vehicles: Tax Benefits &Incentives in the EU*, ACEA, May 2019, https://www.acea.be/uploads/publications/Electric_vehicles-Tax_benefits_incentives_in_the_EU-2019.pdf.

[34] *Vehicles in use…*

member states may be another challenge that the EU will have to face on its path to transport decarbonization.

Benefiting from EVs

The development of the EV industry is begging two questions for the V4. The first one is what needs to be done to foster e-mobility in the region. The second asks how this new trend should be used by the V4 states to strengthen their industries and advance their foreign policy goals.

The decarbonization of transport requires electrification,[35] which also necessitates improved connectivity and increased power consumption. As for the V4, the share of electricity in total energy use[36] is lower than EU's average (22%), Czechia: 19%; Hungary: 18%; Poland: 17%; Slovakia: 21%[37]. The connectivity of power grid remains a challenge as well. In 2015, an EU regional working group was established with Hungary and Slovakia to tackle this problem[38].

V4 countries are also part of five out of nine core transport corridors in the EU (TEN-T): Baltic-Adriatic corridor (Czechia, Poland, Slovakia); Mediterranean corridor (Hungary); North Sea-Baltic (Poland); Orient-East Med (Czechia, Hungary, Slovakia); Rhine-Danube (Czechia, Hungary, Slovakia). According to the directive 2014/94/EU, EV chargers will be developed along the TEN-T[39]. The V4 should go the "extra mile" and develop additional charging infrastructure.

The expansion of the EV industry will also change the way the grid is used. Distributors will have to find balance between peak demands and EVs charging[40], which can be achieved through smart grids and improved energy efficiency[41]. Such grid enables communication between power supplier and consumer, so the supply can

[35] K. Ruby, Decarbonisation Pathways: European Economy, Eurelectric, 11 July 2018, https://ec.europa.eu/info/sites/info/files/d2_s2_speaker2_k.ruby_eurelectric.pdf

[36] Final energy consumption.

[37] B. Bieliszczuk, M. Wąsiński, *Energy transition…*, p. 11.

[38] *Central and South Eastern Europe energy connectivity*, European Commission, 8 November 2019, https://ec.europa.eu/energy/en/topics/infrastructure/high-level-groups/central-and-south-eastern-europe-energy-connectivity.

[39] B. Bieliszczuk, M. Wąsiński, *Energy transition…*, p. 16-18.

[40] *The Value of the Grid*, Eurelectric, June 2019, https://cdn.eurelectric.org/media/3921/value-of-the-grid-final-2019-030-0406-01-e-h-D1C80F0B.pdf, p. 17.

[41] *Ibid*, p. 16.

respond to the changing demand.[42] This can also reduce EVs charging costs and make it more efficient. Czechia and Slovakia are already working together on developing a smart grid connection across their borders (ACON project, included in the PCI list)[43]; the cooperation for local, cross-border smart distribution grid can be strengthened as well. In order to enhance interconnectivity and boost the number of chargers, local authorities will need to cooperate and learn how to utilize the benefits of smart grids.

The above-mentioned cooperation areas are key for EVs development, but the V4 can also use e-mobility to advance its industrial and foreign agenda.

Together with EVs and RES push, new resources become more important. For example, neodymium, a rare-earth element, is used to manufacture permanent magnets used for EV engines. Its production is concentrated in China, which produces 80% of it[44]. The demand for the materials for batteries production (copper, nickel, cobalt, manganese and lithium) will also increase. Some of them are concentrated in authoritarian or unstable countries. For instance, 64% of cobalt production and 49% of its estimated deposits are located in the war-torn Democratic Republic of Congo, where child labor is used for mining[45]. Most of lithium resources and production are located in Chile and Australia. However, China and Russia want to dominate its supply, which is another challenge for the EU[46] (it is estimated, that Chinese entities control about half of lithium production[47]).

Access to raw materials has continued to climb on the EU agenda. In 2011 the EC published a list of raw materials critical for the EU economy. Since then the catalog has been updated three times, and the most recent version includes cobalt and rare-earths (like neodymium). The next one will come out in spring 2020. The list aims to encourage diversification efforts and negotiating trade agreements.

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[42] *What is the Smart Grid?,* U.S. Department of Energy, https://www.smartgrid.gov/the_smart_grid/smart_grid.html.

[43] *Annex to Commission Delegated Regulation (EU)*, European Commission, 31 October 2019, https://ec.europa.eu/energy/sites/ener/files/c_2019_7772_1_annex.pdf.

[44] A. Isaak, *A rare metal called neodymium is in your headphones, cellphone and electric cars like Tesla's Model 3 — and China controls the world's supply*, CNBC, 19 October 2018, https://www.cnbc.com/2018/10/18/neodymium-china-controls-rare-earth-used-in-phones-electric-cars.html

[45] S. Kara, *Is your phone tainted by the misery of the 35,000 children in Congo's mines?,* The Guardian, 12 October 2019, https://www.theguardian.com/global-development/2018/oct/12/phone-misery-children-congo-cobalt-mines-drc

[46] Y. Chazan, *China Rushes to Dominate Global Supply of* Lithium, The Diplomat, 23 February 2019, https://thediplomat.com/2019/02/china-rushes-to-dominate-global-supply-of-lithium; *Wealth Minerals and Rosatom sign MOU*, Mining.com, 8 December 2019, https://www.mining.com/wealth-minerals-and-rosatom-sign-mou

[47] M. Taj, M. Nienaber, *In the new lithium 'Great Game,' Germany edges out China in Bolivia*, Reuters, 28 January 2019, https://uk.reuters.com/article/us-bolivia-lithium-germany/in-the-new-lithium-great-game-germany-edges-out-china-in-bolivia-idUKKCN1PM1LS

This is where opportunities for V4 countries are. This year exploration started at the Tisova copper-cobalt project at the Czech-German border[48]. Another source of cobalt and nickel is Dobsina in Slovakia[49]. The V4 countries should work to rally support for such projects as they ensure diversification/security as well as transparent production rules and respect for human rights[50]. Access to raw materials can play a part in relations with EU/V4 neighborhood, e.g. Ukraine, which has promising resources of lithium and cobalt.

The expansion of EVs will also significantly impact EU industrial policy. European car producers depend on Asian batteries and face competition from China and the U.S. Similarly to the case of raw materials, China wants to dominate ion-lithium battery production[51], which is worrying to both policy-makers and the car industry.

To face these challenges, in 2017 the EC launched the European Battery Alliance, which aims to develop a competitive EU battery manufacturing sector by supporting technological innovation and securing access to raw materials. According to the EC, battery production is key for energy transition and automotive industry. In December 2019, the EC approved €3.2 billion public aid for Belgium, Finland, France, Germany, Italy, Poland and Sweden for research and innovation in all segments of the battery's value chain[52]. The project will focus on: raw and advanced materials, cells and modules, battery systems, recycling and refining. The endeavor is included on the list of Important Projects of Common European Interest. According to the EC, such projects *require joint, well-coordinated efforts and transnational investments by public authorities and industries from several Member States*[53].

The V4 countries should therefore go beyond simple competition for the localization of battery factories[54]. Opportunities are emerging not only for the biggest companies and most developed countries, but also for the new players to find their

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[48] *Canadian miner starts exploring Czech/German copper-cobalt project,* Mining.com, 14 July 2019, https://www.mining.com/canadian-miner-starts-exploring-czech-german-copper-cobalt-project/2/

[49] B. Erkan, *European Cobalt intersects high-grade cobalt and nickel at Dobsina project in* Slovakia, Proactive Investor, https://www.proactiveinvestors.com.au/companies/news/207429/european-cobalt-intersects-high-grade-cobalt-and-nickel-at-dobsina-project-in-slovakia-207429.html.

[50] *Raw materials: Commission launches new online portal to support responsible sourcing in businesses*, European Commission, 20 November 2019, https://ec.europa.eu/commission/presscorner/detail/en/ip_19_6298.

[51] R. Rapier, *Why China Is Dominating Lithium-Ion Battery Production*, Forbes, 4 August 2019, https://www.forbes.com/sites/rrapier/2019/08/04/why-china-is-dominating-lithium-ion-battery-production/#682c8e273786

[52] *State aid: Commission approves €3.2 billion public support by seven Member States for a pan-European research and innovation project in all segments of the battery value* chain, European Commission, 9 December 2019, https://ec.europa.eu/commission/presscorner/detail/en/ip_19_6705

[53] *Industrial policy: recommendations to support Europe's leadership in six strategic business* areas, European Commission, 5 November 2019, https://ec.europa.eu/commission/presscorner/detail/en/IP_19_6204

[54] C. Mathieu, The European Battery Alliance is moving up a gear, Energy Post, 24 May 2019, https://energypost.eu/the-european-battery-alliance-is-moving-up-a-gear

niche, e.g. in battery parts production or battery recycling technology (Polish companies participating in the Battery Alliance will focus on the former).

Recommendations

The EU climate policy, including transport decarbonization, is becoming more ambitious. The V4 countries should propose their own ideas for cleaner transport. New projects can be financed by the European Investment Bank or Juncker Fund. Also, the Three Seas Initiative, in which the V4 participates, can help to pool money for clean and innovative projects.

The aim of the V4 should be more than “rule takers” and simply fulfilling EU climate goals and the directives requirements. The above trends should be part of their industrial policies, which could contribute to EU’s energy transformation and benefit V4 economies thanks to Visegrad’s added value to modern and clean automotive industry. Having said that, while the goal of developing clean mobility is ambitious, the V4 should adopt a realistic approach; carving a niche in the value chain for EVs could be considered. Finding such niche for batteries production and/or participating in European R&D projects could be one of the flagship projects in V4 cooperation for energy transition.