pspa | We drive e-mobility!

POLAND DRIVES E-MOBILITY

Warsaw 2022

Cooperation F5A New Mobility Research & Consulting

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

EV	Electric vehicle
BEV	Battery electric vehicle
PHEV	Plug-in hybrid electric vehicle
FCEV	Fuel cell electric vehicle
CNG	Compressed natural gas
LNG	Liquefied natural gas
ICE	Internal combustion engine
E-bus	Electric bus
DC	Direct current
AC	Alternating current
Li-ion	Lithium-ion
GWh	Gigawatt hour
OEM	Original equipment manufacturer
GVW	Gross vehicle weight
TSL	Transport spedition logistic

1 POLISH AUTOMOTIVE SECTOR IN NUMBERS

The automotive branch is one of the key engines driving the Polish economy

EUR 36 billion

The automotive industry production value

Share of the automotive industry in the industrial production

Share of the automotive industry in GDP

397,000

Total sector employment

→ 3rd place in the European Union

210,000

Employment in manufacture of motor vehicles, trailers and semi-trailers

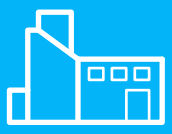
→ 7.6% share in total industry employment

Sources of data: „Automotive industry Q2 / 2022" PZPM / KPMG, „Automotive industry in Poland 2021-2022" SDCM, „How will e-mobility change the Polish labour market? Green sectors of the future" by PSPA and BCG, AutomotiveSuppliers.pl, IBRM Samar, KPMG, Polish Investment and Trade Agency (PFR Group), GUS, Eurostat

Share in total exports of goods in Q1 2022

EUR 8.29 billion

Value of export in Q1 2022



342

Number of companies operating in the sector (with at least 50 employees)

553,257

Number of new passenger and delivery cars registered in 2021

PRODUCTION IN 2021:

260,500

Passenger cars

→ 3rd place in the CEE region

173,400

Utility cars

5,200

Buses

Sources of data: „Automotive industry Q2 / 2022" PZPM / KPMG, „Automotive industry in Poland 2021-2022" SDCM, „How will e-mobility change the Polish labour market? Green sectors of the future" by PSPA and BCG, AutomotiveSuppliers.pl, IBRM Samar, KPMG, Polish Investment and Trade Agency (PFR Group), GUS, Eurostat

2 MADE IN POLAND – AUTOMOTIVE SECTOR

BUS PRODUCTION FACILITIES

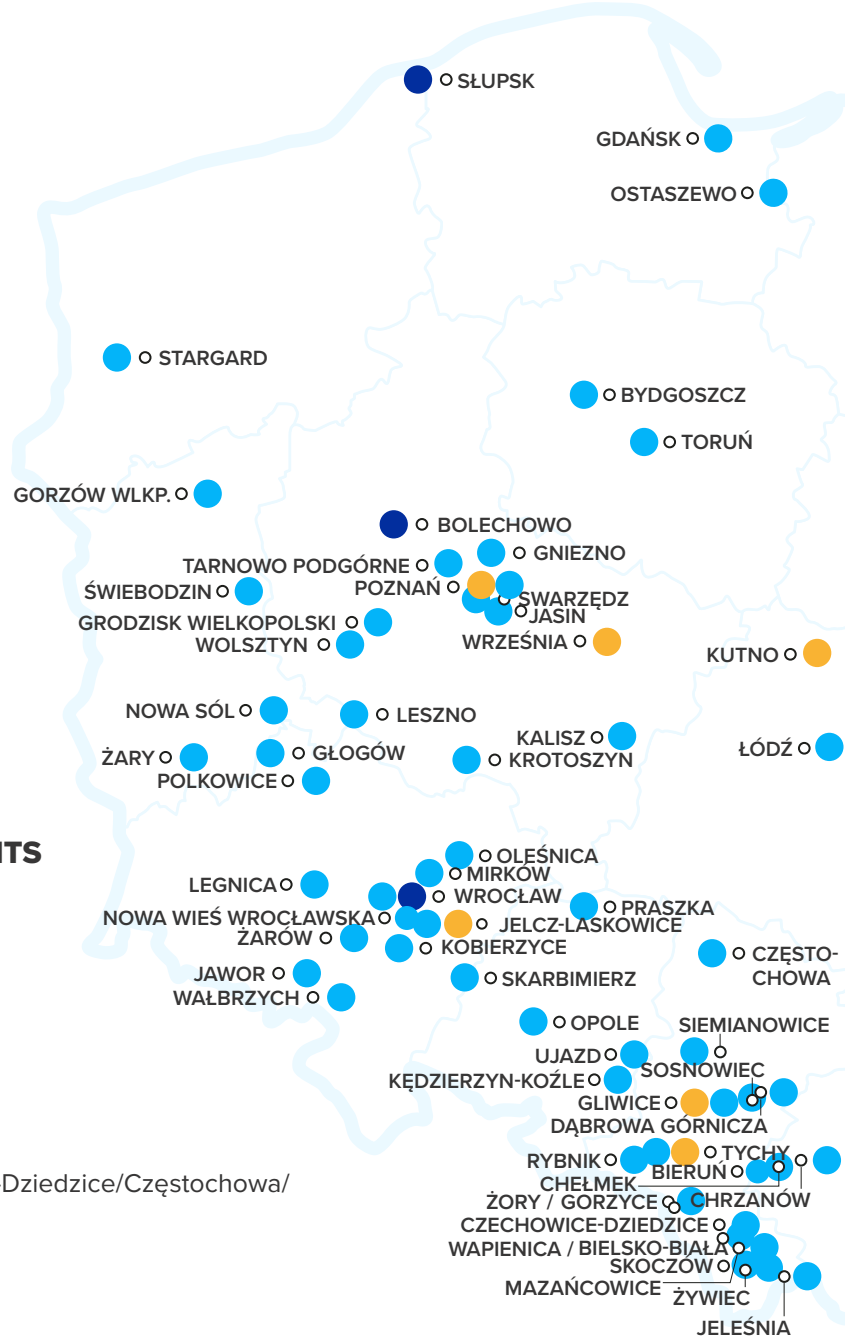
Solaris – Bolechowo
Volvo Buses – Wrocław
MAN Bus – Starachowice
Autosan – Sanok
Scania – Słupsk

CAR PRODUCTION FACILITIES

Stellantis – Tychy
Volkswagen – Poznań
Volkswagen – Września
Opel – Gliwice
MAN – Niepołomice
Triggo – Warszawa
Melex – Mielec
AMZ-Kutno – Kutno
Automet – Sanok
Jelcz – Jelcz-Laskowice

SELECTED AUTOMOTIVE COMPONENTS PRODUCTION FACILITIES

Mercedes-Benz – Jawor
Stellantis – Bielsko-Biała
Opel – Tychy
Toyota – Wałbrzych/Jelcz-Laskowice
Volkswagen – Poznań/Polkowice
Inter Groclin Auto – Grodzisk Wielkopolski
ZF Friedrichshafen – Bielsko-Biała/Czechowice-Dziedzice/Częstochowa/ Gliwice/Wrocław
Ronal Group – Wałbrzych/Jelcz-Laskowice
Michelin – Olsztyn
Bridgestone – Poznań/Stargard/Wolsztyn/Żarów
Goodyear – Dębica
Kirchoff Automotive – Gliwice/Mielec/Gniezno
Magna – Dąbrowa Górnicza/Kędzierzyn-Koźle/Tychy/ Swarzędz
Valeo – Skawina/Zielonki/Chrzanów/Czechowice-Dziedzice
Lear Corporation – Tychy/Jarosław/Legnica/Bieruń/Mielec
Boryszew Group – Tychy/Chełmek/Toruń/Ostaszewo

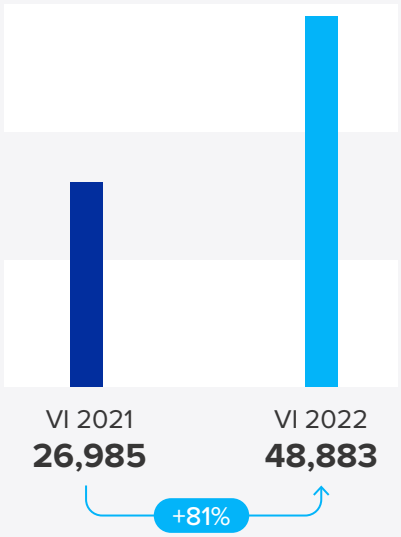


SELECTED AUTOMOTIVE COMPONENTS PRODUCTION FACILITIES (cont.)

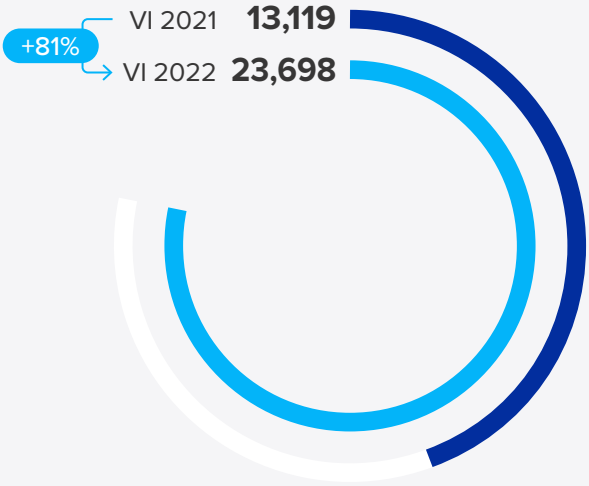
CK Holdings (Magneti Marelli) – Sosnowiec/Bielsko-Biała
Brembo – Dąbrowa Górnicza/Częstochowa
Hutchison – Żywiec/Łódź/Dębica
Autopart S.A. – Mielec
ZAP Sznajder Batterien S.A. w Warszawie – Piastów
Pilkington Automotive Poland – Sandomierz/Chmielów
Saint-Gobain Innovative Materials Polska – Żary/Dąbrowa Górnicza
Knauf Industries – Nowa Wieś Wrocławska
Wirthwein Polska – Łódź
AC S.A. – Białystok
BorgWarner – Jasionka
Federal-Mogul – Gorzyce
Bosch – Mirków
Denso – Tychy
Bury Technologies – Mielec
MA Polska – Tychy, Kielce
Aptiv – Gdańsk, Jeleśnia
Delphi Technologies – Błonie
Exide Technologies – Poznań
Faurecia – Grójec/Gorzów Wlkp./Legnica/Wałbrzych/Jelcz-Laskowice
Gedia – Nowa Sól
Sanok Rubber Company – Sanok
Nexteer – Tychy/Gliwice
Kuźnia Polska – Skoczów
Global Steering Systems – Opole
Tru-Flex – Ujazd
Adient – Siemianowice/Żory/Skarbimierz/Świebodzin/Bieruń
Kimball Electronics – Tarnowo Podgórne
Leoni – Kobierzyce
Mahle – Krotoszyn
Polmotors – Mazańcowice
GKN Driveline – Oleśnica
NGK – Gliwice/Dąbrowa Górnicza
Autoliv – Jelcz-Laskowice
NSK – Kielce/Wałbrzych
Pro-Cars Group – Tychy
SE Bordnetze – Gorzów Wlkp.
Sitech – Polkowice/Głogów/Września
Spinko – Leszno
Tenneco – Poznań/Rybnik/Gliwice
Neapco – Praszka
Sumiriko – Wolbrom/Zagórz/Sosonowiec
Teknia – Kalisz/Rzeszów
Gestamp – Wrocław/Września
TI Poland – Wapienica/Wyszków/Jasin/Bielsko-Biała
Superior Industries Poland – Stalowa Wola
Erko – Olsztyn (under construction)
Harting – Bydgoszcz

3 POLISH E-MOBILITY IN NUMBERS

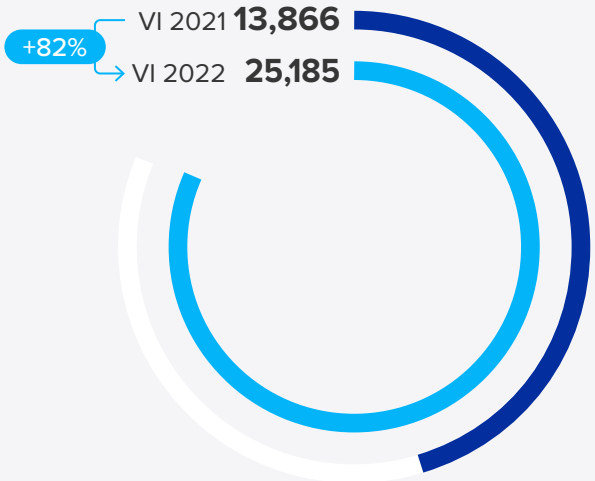
NUMBER OF ELECTRIC PASSENGER CARS (BEV + PHEV)



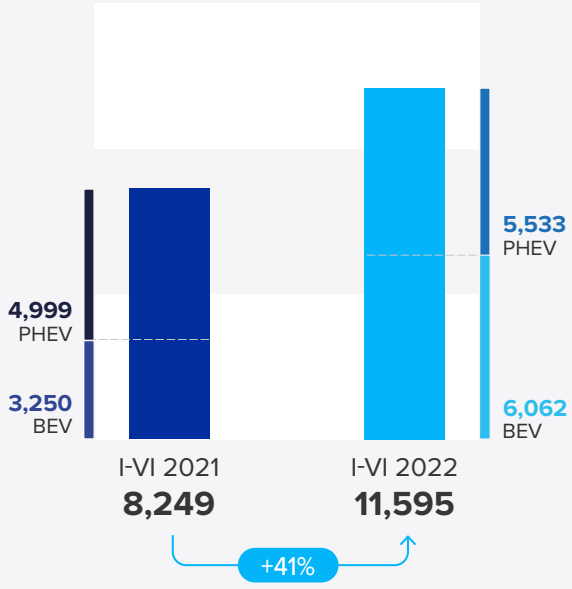
NUMBER OF PASSENGER BEVs



NUMBER OF PASSENGER PHEVs

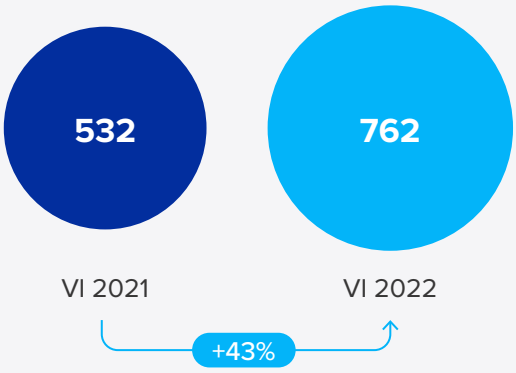


NUMBER OF NEWLY REGISTERED PASSENGER CARS (NEW AND USED)

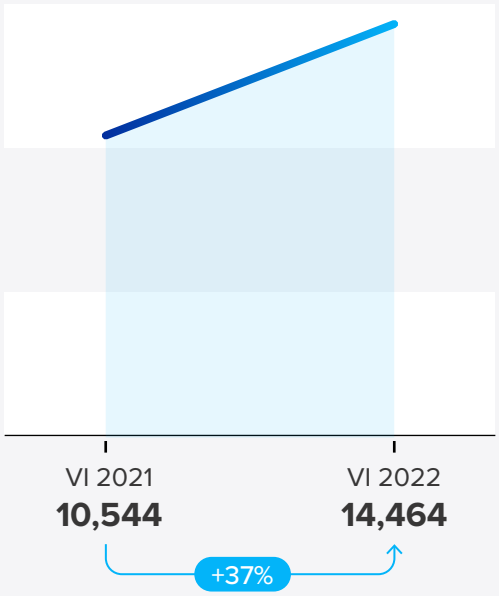


Source of data: E-Mobility Index by PSPA and PZPM

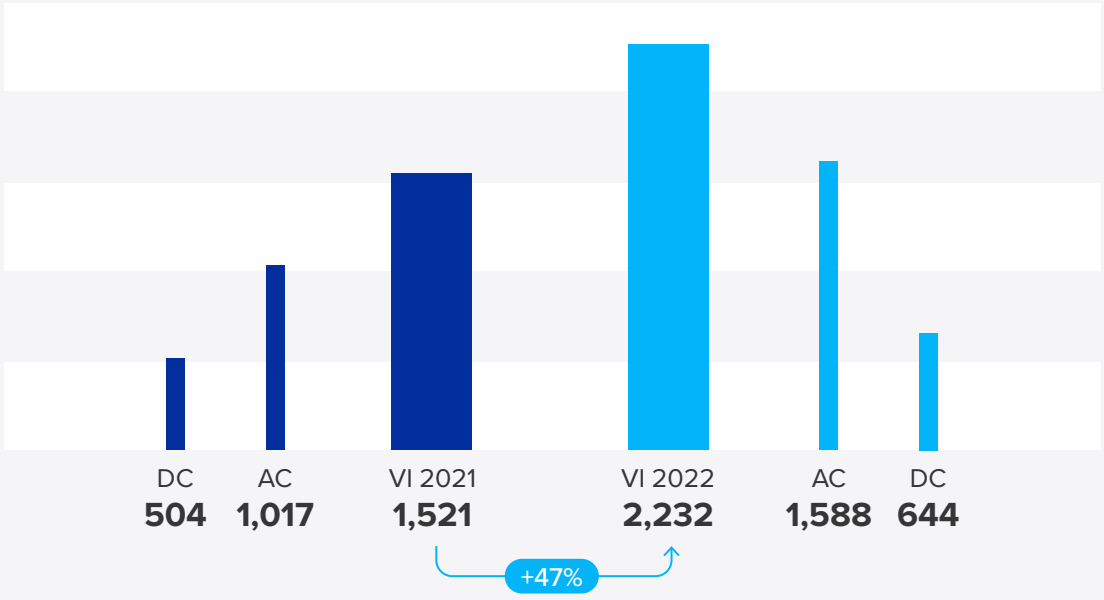
NUMBER OF ELECTRIC BUSES



NUMBER OF ELECTRIC MOTORCYCLES AND MOPEDS



NUMBER OF PUBLIC CHARGING STATIONS



Source of data: E-Mobility Index by PSPA and PZPM

4 MADE IN POLAND – E-MOBILITY

E-BUS PRODUCTION FACILITIES

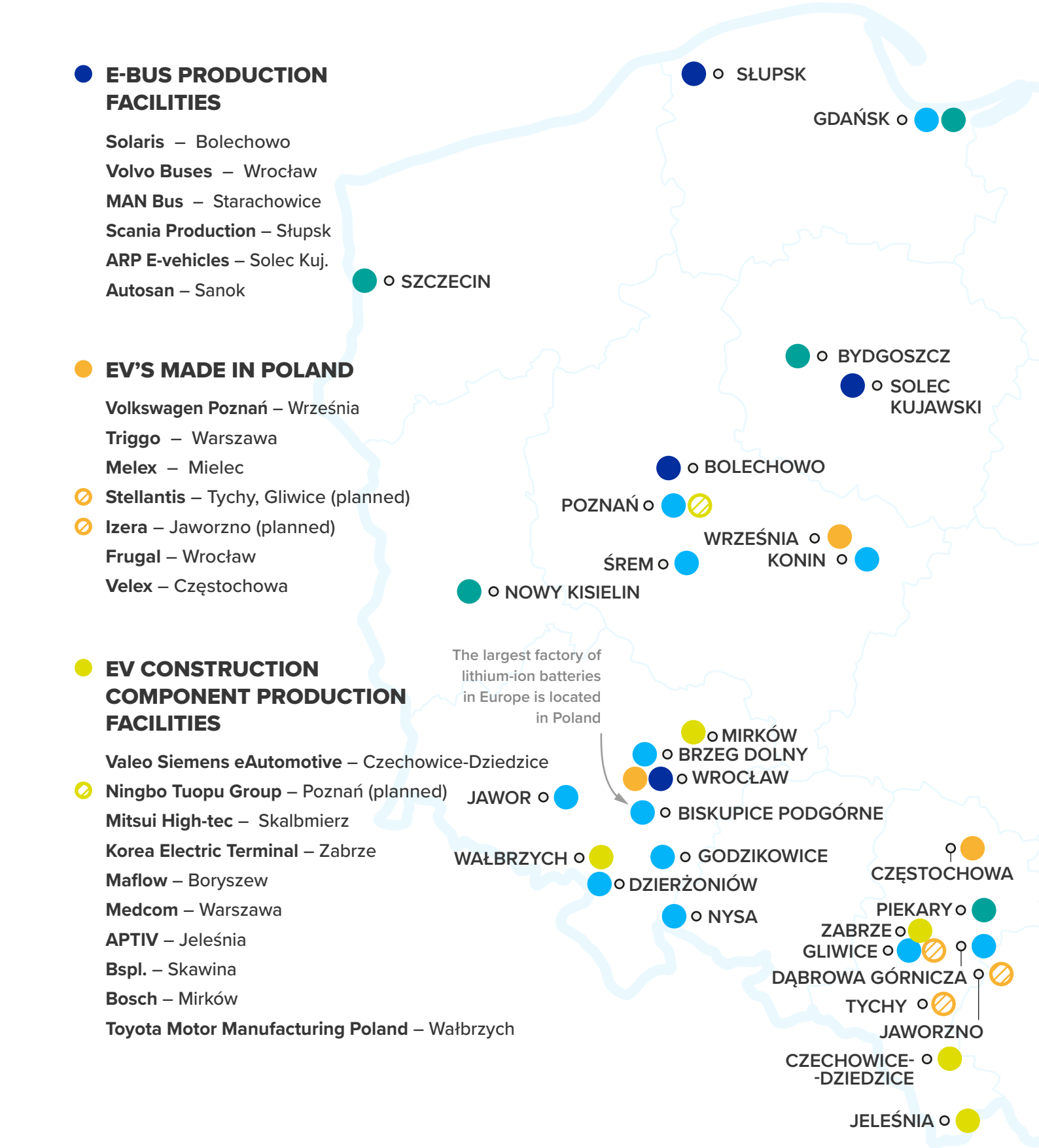
Solaris – Bolechowo
Volvo Buses – Wrocław
MAN Bus – Starachowice
Scania Production – Słupsk
ARP E-vehicles – Solec Kuj.
Autosan – Sanok

EV'S MADE IN POLAND

Volkswagen Poznań – Września
Triggo – Warszawa
Melex – Mielec
Stellantis – Tychy, Gliwice (planned)
Izera – Jaworzno (planned)
Frugal – Wrocław
Velex – Częstochowa

EV CONSTRUCTION COMPONENT PRODUCTION FACILITIES

Valeo Siemens eAutomotive – Czechowice-Dziedzice
Ningbo Tuopu Group – Poznań (planned)
Mitsui High-tec – Skalbmierz
Korea Electric Terminal – Zabrze
Maflow – Boryszew
Medcom – Warszawa
APTIV – Jeleśnia
Bspl. – Skawina
Bosch – Mirków
Toyota Motor Manufacturing Poland – Wałbrzych



Active investment projects

Number	**24**
Value	**EUR 5 billion**
Employment	**approx. 7,000**

Source of data: PAIH

CELLS, LITHIUM-ION BATTERIES AND BATTERY COMPONENTS FACILITIES

LG Energy Solution – Biskupice Podgórne
Northvolt – Gdańsk
Daimler – Jawor
BMZ – Gliwice
Umicore – Nysa
Guotai Huarong – Godzikowice
LS EV Poland – Dzierżoniów
Impact Clean Power Technology – Warszawa
Johnson Matthey – Konin
Capchem – Śrem
PCC Rokita i Shida – Brzeg Dolny
SK IE Technology – Dąbrowa Górnicza
Exide Technologies – Poznań
SK Nexilis – Stalowa Wola (planned)

EV CHARGING STATIONS PRODUCTION FACILITES

Garo Polska – Szczecin
Ekoenergetyka-Polska – Nowy Kisielin (near Zielona Góra)
Enelion – Gdańsk
PRE Edward Biel – Piekary
Kolejowe Zakłady Łączności – Bydgoszcz
EC Enginneering – Kraków
Phoenix Contact E-Mobility – Rzeszów
ZPUE – Włoszczowa
GreenCell – Kraków
Z.U.P. EMITER – Limanowa

EV POWERTRAIN COMPONENT PRODUCTION FACILITIES

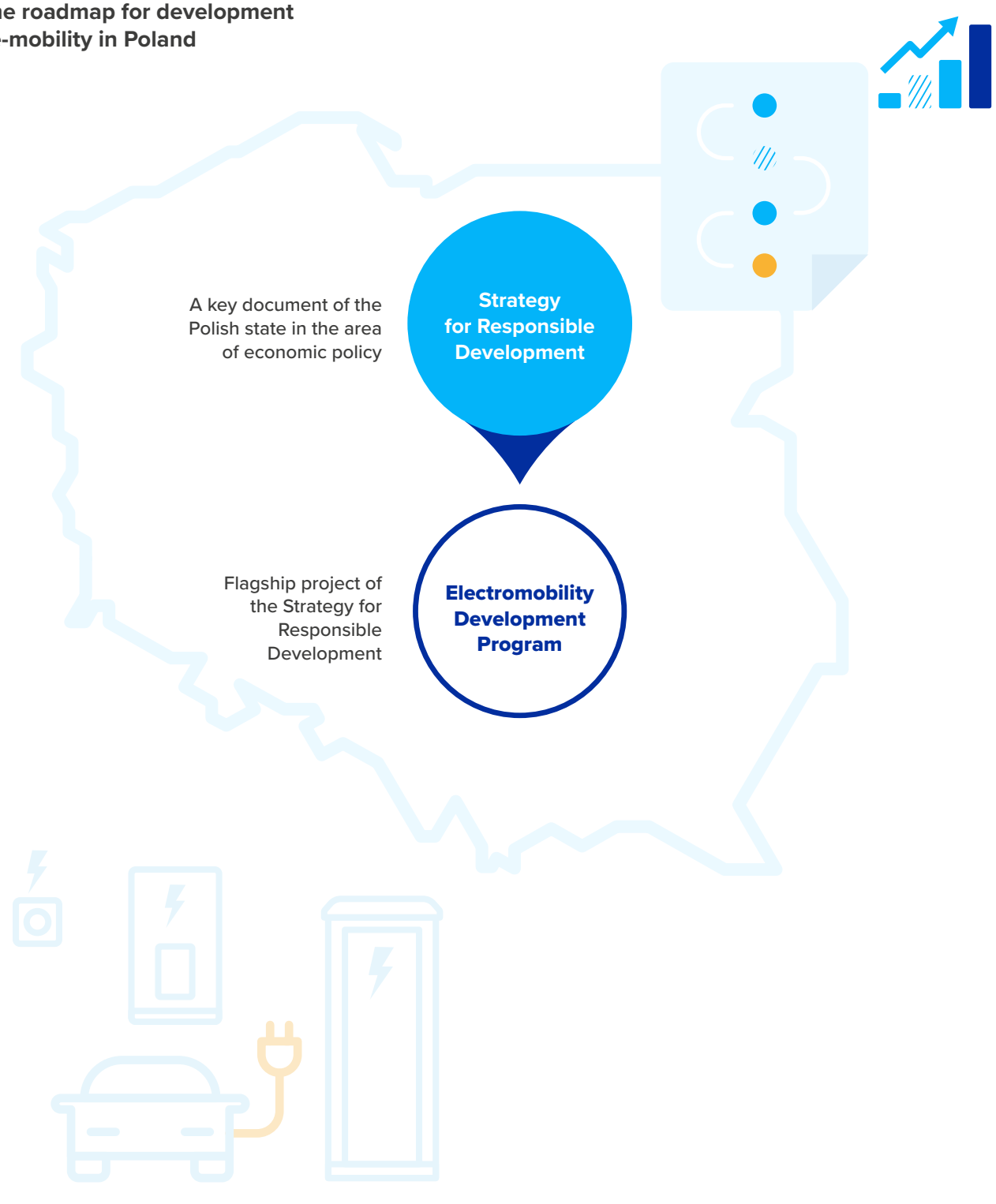
MEDCOM – Warszawa

Status as of November 2021

5 POLAND'S STUNNING E-MOBILITY PLANS

Leading to the e-mobility transition

– the roadmap for development of e-mobility in Poland



Effects of the Electromobility Development Program

Electromobility Development Program

Adopted documents and legal regulations:

Electromobility Development Plan in Poland

Adopted by the government on
16/03/2017

It defines the benefits associated with the widespread use of electric vehicles and identifies the economic and industrial potential of this area

National framework for alternative fuels infrastructure development policy

Adopted by the government on
29/03/2017

They implement European regulations into the Polish legal order (Directive 2014/94/EU of the European Parliament and of the Council)

Act on Electromobility and Alternative Fuels

It came into force on
22/02/2018

It creates a comprehensive legal framework by stimulating the development of e-mobility and promoting the use of alternative fuels in the transport sector in Poland

Electromobility financial support system

It came into force in
2021

It creates financing instruments for the development of e-mobility by i.e. introducing subsidies for the purchase of electric cars and charging infrastructure

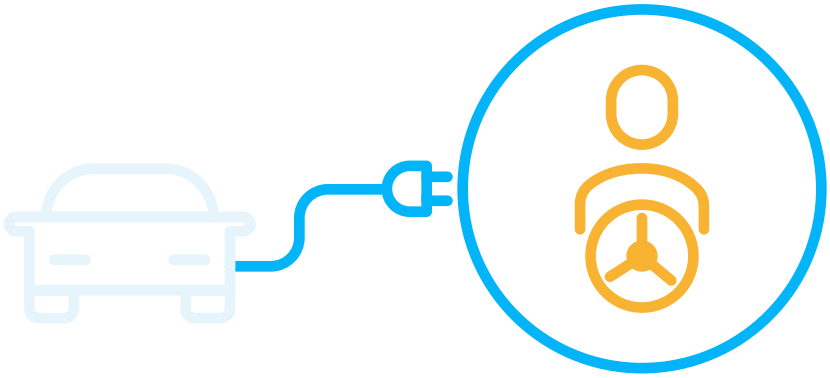
6 POLAND'S UNIQUE E-MOBILITY LAW

Act on Electromobility and Alternative Fuels

Date of entry into force: 22/02/2018

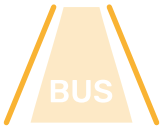
Privileges for drivers

Statutory incentives for purchasing zero-emission vehicles



Exemption from excise duty

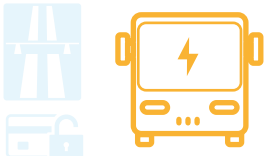
Tax privileges for electric vehicle users – PIT/CIT



Possibility of electric vehicles using bus lanes

Possibility of parking EVs free-of-charge in paid zones in city centres

Unlimited entry of electric vehicles to Clean Transport Zones



Exemption of zero-emission buses from tolls on national roads

Amendments to the law regarding e-mobility in 2021 (selected regulations):

- Facilitating the installation of chargers in multi-family buildings
- Facilitating the implementation of Clean Transport Zones
- Introducing the obligation to provide energy infrastructure in buildings and connection capacity for charging stations
- Acceleration of the installation of high-power charging stations

Obligations of public entities

The administration statutorily supports the development of ecological transport

CENTRAL AUTHORITIES

In the fleet of general and central state administration bodies, fully electric vehicles must constitute:

AS OF 01/01/2022	AS OF 01/01/2023	AS OF 01/01/2025
At least	At least	At least
10%	20%	50%

LOCAL GOVERNMENT UNITS

OVER 50,000 RESIDENTS

The share of fully electric vehicles in the fleet of vehicles in use in the office must constitute:

AS OF 01/01/2022	AS OF 01/01/2025
At least	At least
10%	30%

The share of fully electric vehicles or vehicles powered by CNG and LNG in the performance of public tasks, excluding public collective transport, must constitute:

AS OF 01/01/2022	AS OF 01/01/2025
At least	At least
10%	30%

They provide or commission public transport services using zero-emission buses in the number of:

AS OF 01/01/2021	AS OF 01/01/2023	AS OF 01/01/2025	AS OF 01/01/2028
At least	At least	At least	At least
5%	10%	20%	30%

7 E-MOBILITY FINANCIAL SUPPORT SYSTEM

Programs of National Fund for Environmental Protection and Water Management

PROGRAM

My EV (Mój Elektryk)

BUDGET

700,000,000 PLN

EUR ca. 147,000,000

Subsidies for natural persons

Financing	Budget
Purchase	**PLN 100,000,000** (EUR ca. 21,000,000)

Vehicle Category	Type
M1	**Zero-emission**

Max. vehicle price

PLN 225,000 (EUR ca. 48,000) / **No limit** (for the Large Family Card holders)

Max. amount of the subsidy

PLN 18,750 (EUR ca. 4,000) / **PLN 27,000** (EUR ca. 5,700 for the Large Family Card holders)

Subsidies for entrepreneurs, local governments and other institutional entities

Financing	Budget
Purchase / Leasing / Rent	**PLN 600,000,000** (EUR ca. 126,000,000)

Vehicle Category	Type
M1	**Zero-emission**

Max. vehicle price

PLN 225,000

Max. amount of the subsidy

PLN 18,750 (EUR ca. 4,000, no average annual mileage required) / **PLN 27,000** (EUR ca. 5,700, for annual average milage > 15,000 km)

Vehicle Category	Type
N1	**Zero-emission**

Max. amount of the subsidy

PLN 50,000 (EUR ca. 11,000, up to 20% of eligible costs, no average annual mileage required) /
PLN 70,000 (EUR ca. 15,000, up to 30% of eligible costs, for annual average milage higher than 20,000 km)

Vehicle Category	Type
L1e-L7e	**Zero-emission**

Max. amount of the subsidy

PLN 4,000 (EUR ca. 850, up to 30% of eligible costs)

PROGRAM

Green Public Transport

(Zielony Transport Publiczny)

BUDGET

2,500,000,000 PLN

EUR ca. 527,000,000

Maximum level of support

Electric bus – 80% of eligible costs

Hydrogen bus – 90% of eligible costs

Trolleybus – 80% of eligible costs

Infrastructure – 50% of eligible costs

100% of eligible cost in the case of returnable forms of support

Beneficiaries

Operators and organizers of public collective transport, including local government units

Duration

2035 (expenses)

PROGRAM

Support for electric vehicle charging infrastructure and hydrogen refueling infrastructure

(Wsparcie infrastruktury do ładowania pojazdów elektrycznych i infrastruktury do tankowania wodoru)

BUDGET

870,000,000 PLN

EUR ca. 183,000,000

Maximum level of support for charging stations with power of at least

22 kW – 25% of eligible costs

50 kW to less than 150 kW – 30% of eligible costs (**45%** in the case of smaller municipalities)

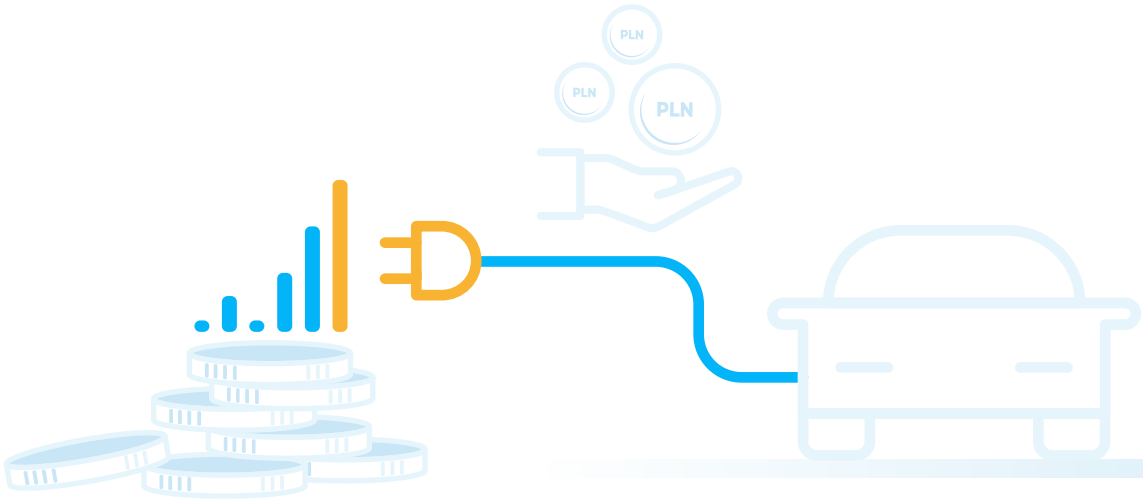
150 kW – 50% of eligible costs

Beneficiaries

Local government units, entrepreneurs, cooperatives, housing communities, individual farmers

Duration

2038

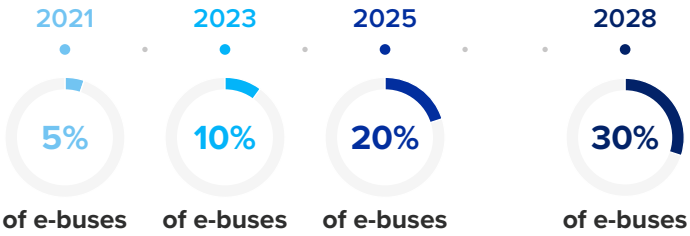


8 POLISH SPECIALIZATION – ELECTRIC BUSES

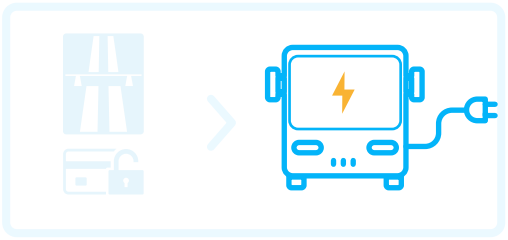
LEGISLATIVE SUPPORT

Act on Electromobility and Alternative Fuels

→ Imposes obligations in the field of rolling stock electrification on Polish local governments:



→ Introduces the exemption of zero-emission buses from tolls on national roads



FINANCIAL SUPPORT

Program of National Fund for Environmental Protection and Water Management

→ **Green Public Transport**
2,500,000,000 to finance the purchase of electric and hydrogen city buses

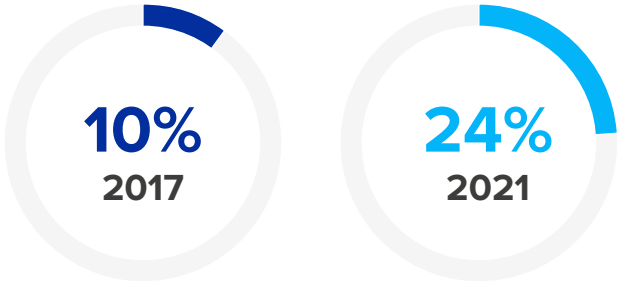
European Funds

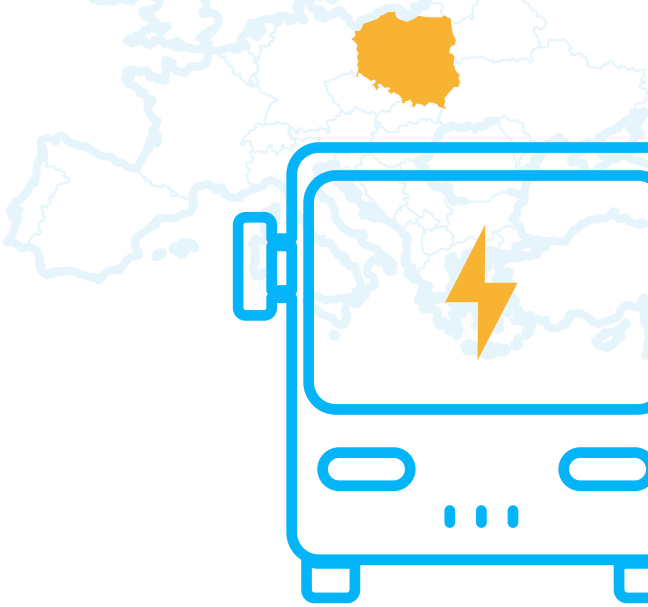
→ **Regional Operational Programs**
→ **Operational Program Eastern Poland**
→ **The Infrastructure and Environment Program**

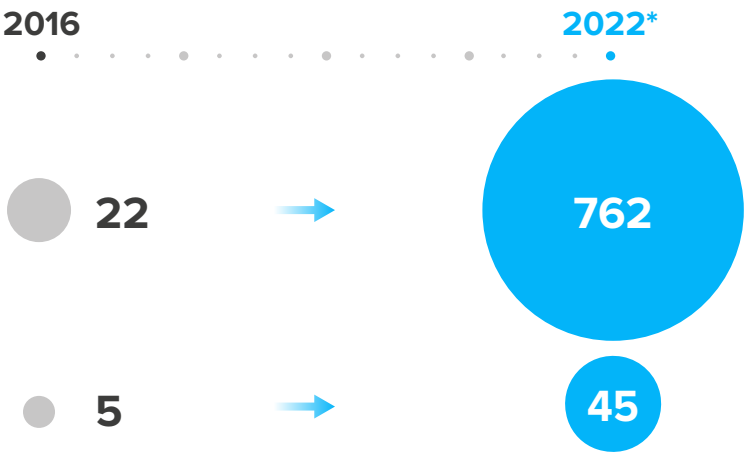
Polish electric bus market

No 1

Poland's share of exports of e-Buses in EU

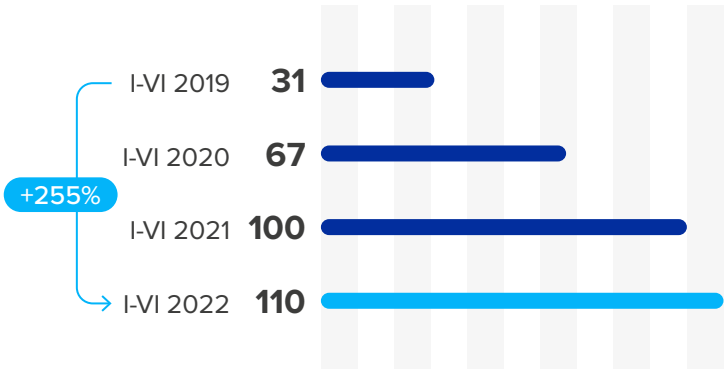






* Status as of June 2022

Increase in the number of registrations of electric buses in Poland



Leading producers of e-buses in EU 2021

1	Solaris
2	BYD-ADL
3	Mercedes
4	Yutong
5	Iveco Bus
6	BYD
7	Volvo Buses
8	Irizar
9	VDL
10	MAN

Sources of data: E-Mobility Index by PSPA and PZPM, sustainable-bus.com, PSPA, Polish Economic Institute, Chatrou CME Solutions

9 POLISH SPECIALIZATION – CHARGING INFRASTRUCTURE

LEGISLATIVE SUPPORT

- **Act on Electromobility and Alternative Fuels**

MINIMUM NUMBER OF CHARGING POINTS AT PUBLIC CHARGING STATIONS IN POLISH COMMUNES

Until 31/03/2021

Number of residents	> 1,000,000	> 300,000	> 150,000	> 100,000
Number of vehicles	≥ 600,000	≥ 200,000	≥ 95,000	≥ 60,000
Number of vehicles per 1,000 residents	≥ 700	≥ 500	≥ 400	≥ 400
Number of charging points	1,000	210	100	60

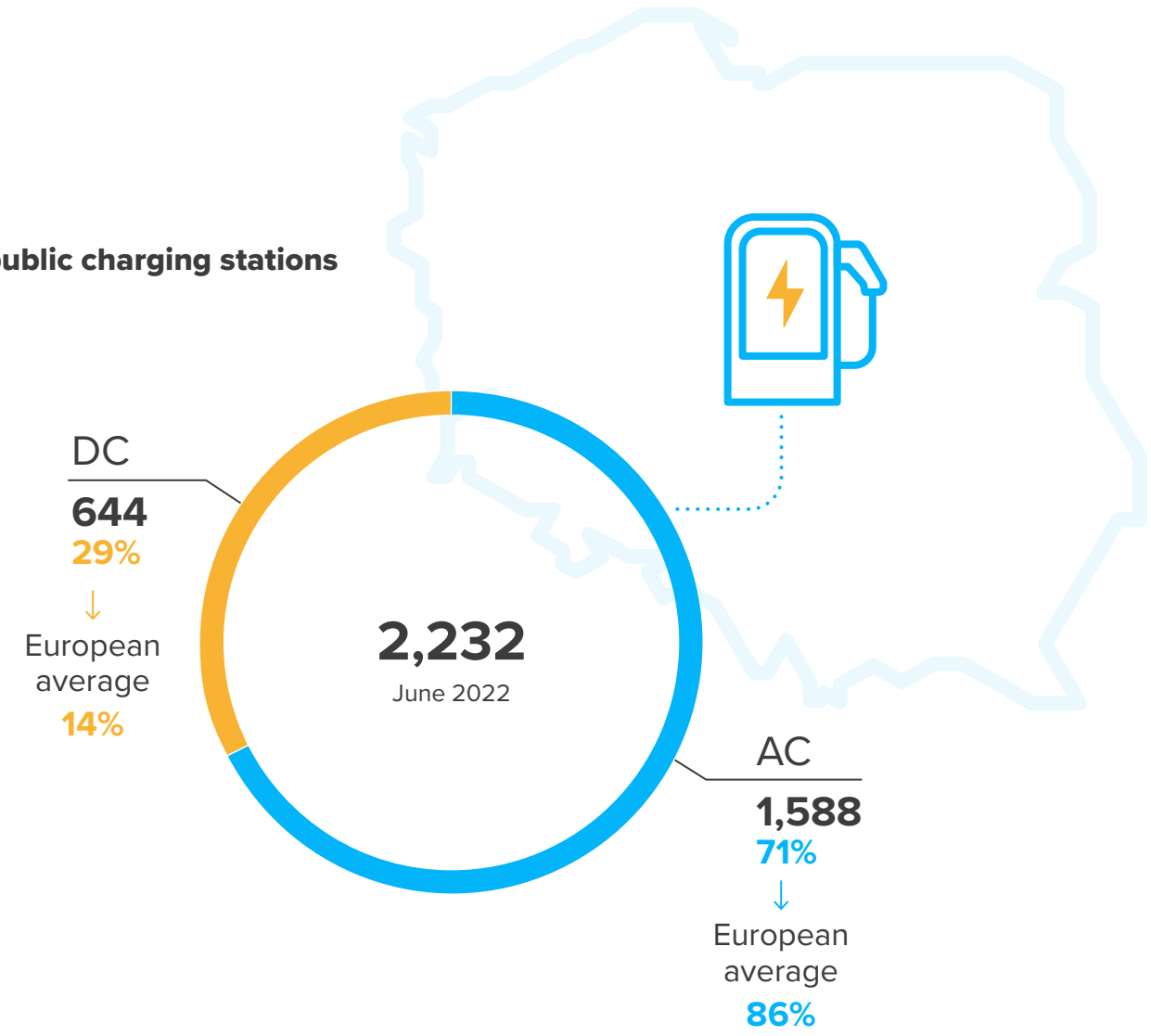
FINANCIAL SUPPORT

- **Programs of National Fund for Environmental Protection and Water Management**

→ **Support for electric vehicle charging infrastructure and hydrogen refueling infrastructure** – public and private charging infrastructure

→ **Green Public Transport** – public transport charging infrastructure

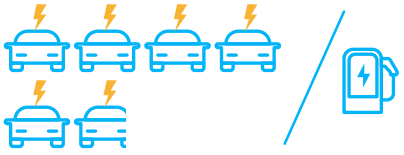
Number of public charging stations



Number of passenger electric cars (BEV) per public charging point

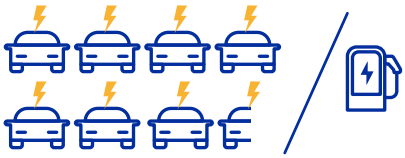
Poland

ca. **5.8**

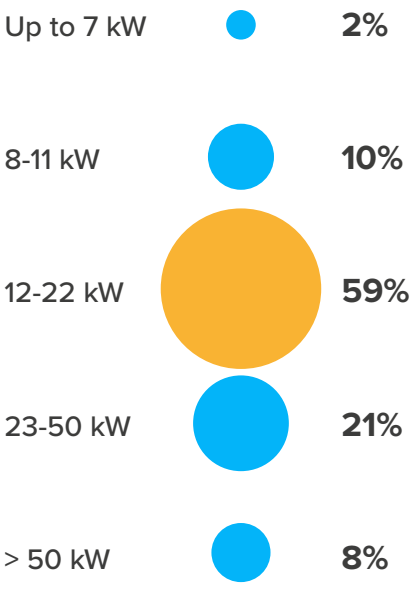


European average

ca. **7.5**



Share of charging stations with the power of:



Sources of data: PSPA "Polish EV Outlook 2022"; IEA

10 POLISH SPECIALIZATION – LI-ION BATTERIES

Poland's place in lithium-ion battery supply chain rank

(manufacturing capacity of electrolyte salts and solutions, anodes, cathodes, separators and cells)*

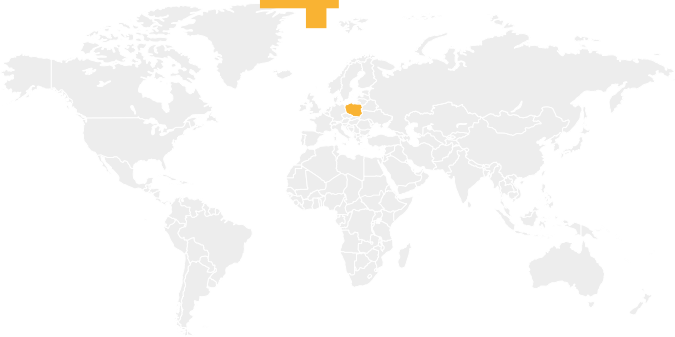
2020/2025

EUROPE

1st

WORLD

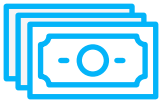
4th



Poland – European center of li-ion batteries production

Strategically located

Great base of qualified workers

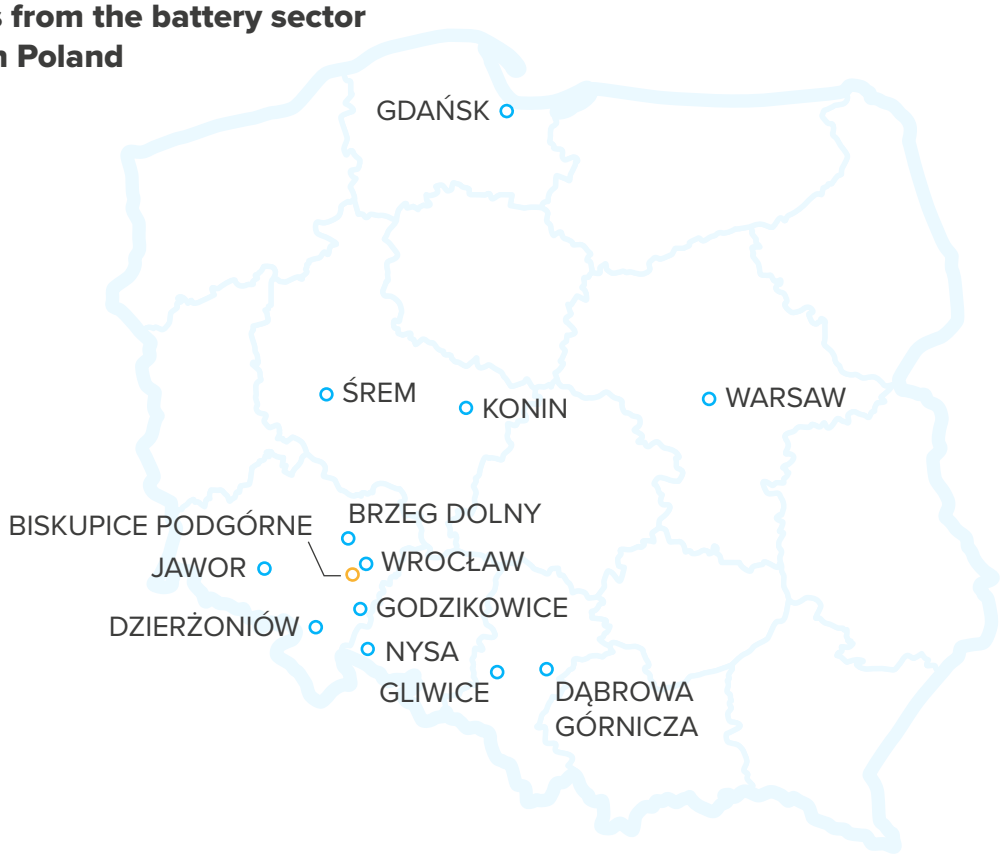


Favourable conditions for business

State's support for investors

* Source: BloombergNEF

Companies from the battery sector investing in Poland



LG Energy Solution Wrocław

- **Lithium-ion batteries for electric cars**
  - → The largest plant producing li-ion batteries in Europe
  - → One of the largest plant producing li-ion batteries in the world
  - → The largest foreign investment in Poland
- **Location**: Biskupice Podgórne
- **Year of commencement**: 2016
- **Target annual capacity**: > 70 GWh (up to 115 GWH in 2025)
  - → Enough to supply 500,000 electric cars with li-ion batteries each year
- **Total employment**: > 10,000

Umicore | Nysa
- Cathodes for lithium-ion batteries

Guotai Huarong | Godzikowice
- Electrolyte for lithium-ion batteries

Capchem | Śrem
- Electrolyte for lithium-ion batteries

SK Innovation | Dąbrowa Górnicza
- Separators for lithium-ion electric vehicle batteries

Daimler | Jawor
- High voltage batteries for electric cars from the EQ line

LS EV Poland | Dzierżoniów
- Electronic components for electric vehicle batteries

Impact Clean Power Technology | Warsaw
- Battery systems for electric vehicles

Northvolt | Gdańsk
- Battery modules

BMZ | Gliwice
- Batteries for buses, scooters and electric bicycles

PCC Rokita i Shida | Brzeg Dolny
- Organic carbonates for electric vehicle batteries

Exide Technologies | Poznań
- Battery solutions

SK Nexilis | Stalowa Wola
- Copper foil for lithium-ion batteries

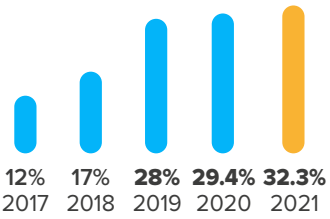
Foosung Poland | Kędzierzyn-Koźle (planned)
- Inorganic fluorine compounds

Wamtechnik | Warsaw
- Service and production of li-ion batteries

Sources of data: eib.org, PSPA

11 GROWING SOCIAL AWARENESS

Year by year, drivers in Poland are becoming increasingly interested in electric vehicles



EV trend

In 2021, the upward trend related to the interest of Poles in purchasing an electric vehicle was maintained

32.3%

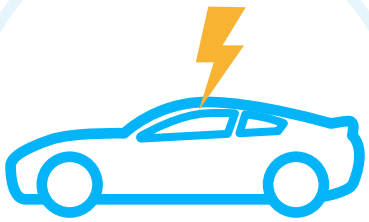
As many as 32,3% of Poles declare that they will realistically consider buying a vehicle with electric drive in the near future, getting acquainted with the market offer in this area (period of 3 years)

Retreat from Diesel

The popularity of Diesel engines is declining – from 38% in 2017 to 16.3% in 2021

94.5%

The vast majority (94.5%) of EV users in Poland are satisfied with their electric vehicles



Preferred price

The price range for which most respondents would like to buy an electric car is PLN 100,000-150,000

Infrastructure

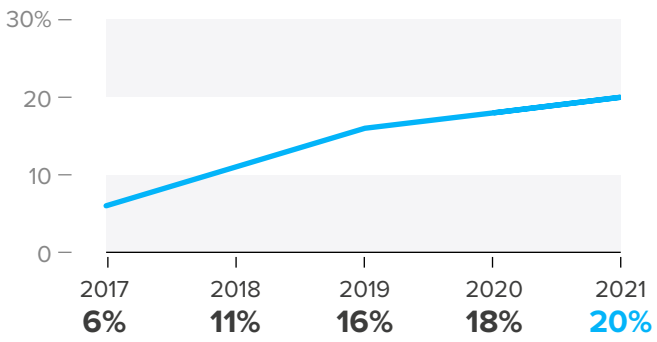
The development of e-mobility depends on the pace of expansion of the charging infrastructure. 46,3% of survey participants would like to charge their electric car at their place of residence, 20.4% at work, 32.7% while performing other activities (e.g. while shopping), and 0.6% elsewhere

Electromobility – the future of the transport sector

79.5% of Poles believe that electric cars will replace combustion vehicles in the future

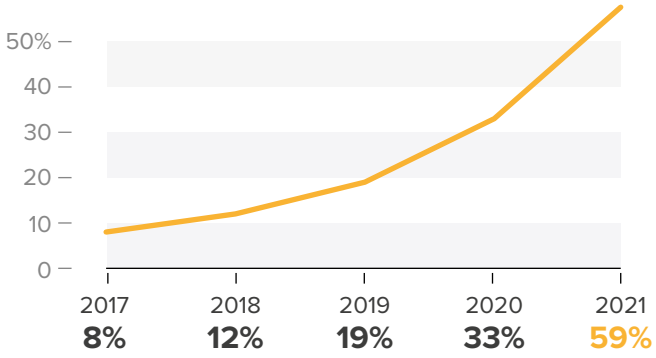
Growing popularity of e-mobility

More and more Poles had the opportunity to drive an electric car

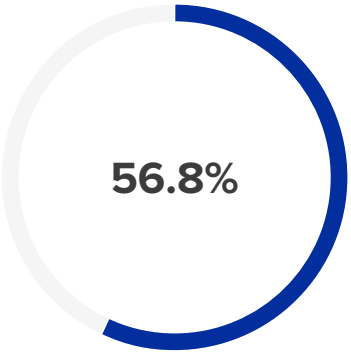


Growing ecological awareness

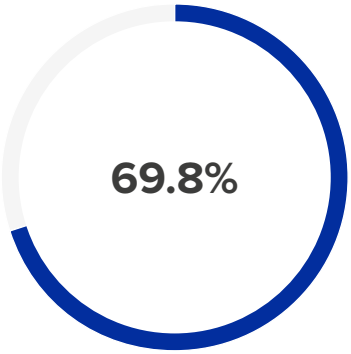
More and more Poles recognize the positive impact of EV on the environment



Zero-emission public transport



Poles move around the city using public transport services

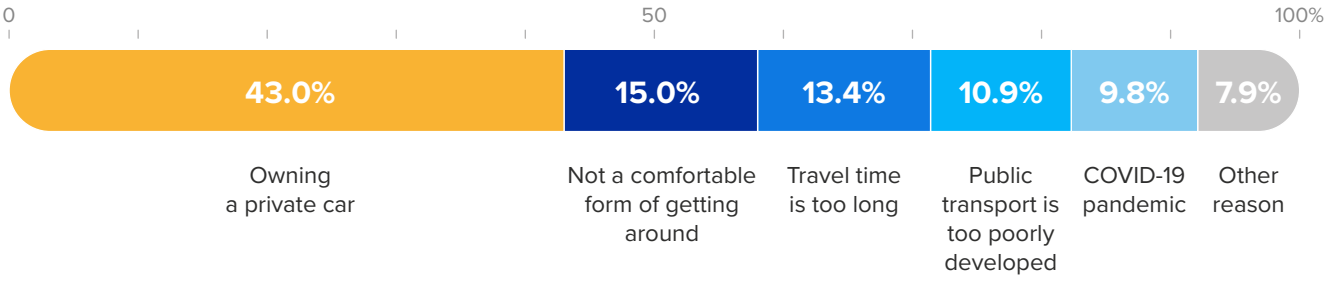


Poles using public transport choose this form of transport at least once a week

How often do Poles use public transport?

Everyday | 3-5 times a week | Once a week | Several times a month | Less often

Main reasons why Poles do not want to use public transport

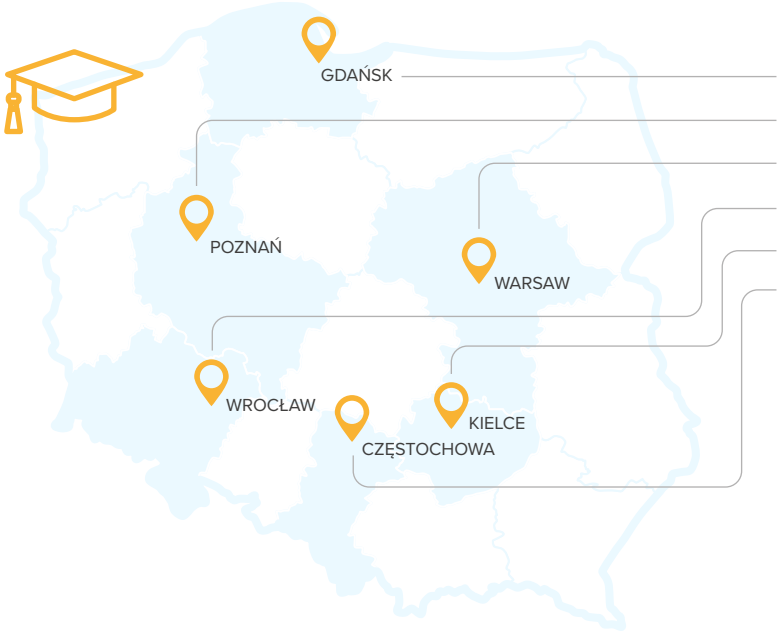


Owning a private car | Not a comfortable form of getting around | Travel time is too long | Public transport is too poorly developed | COVID-19 pandemic | Other reason

Source of data: “New Mobility Barometer 2021/2022” by PSPA

12 EDUCATION AND RAISING PUBLIC AWARENESS

Polish universities educate engineers in the electromobility sector



Gdańsk University of Technology
Poznań University of Technology
Warsaw University of Technology
Wrocław University of Science and Technology
Kielce University of Technology
Częstochowa University of Technology

64.9%
of all vocational schools in Poland provide education in professions dedicated to the automotive industry

4776
schools in Poland educate people who can find employment in professions in the automotive industry

Elektromobilni.pl

The largest educational campaign devoted to electromobility in the CEE region run by the Polish Alternative Fuels Association (PSPA) and the National Centre for Climate Change (KOZK)

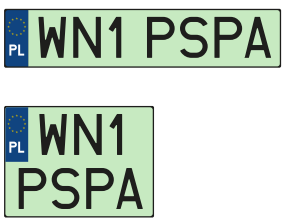
30 partners across the entire electromobility value chain

A comprehensive knowledge base on zero-emission transport

Practical tools and calculators to facilitate the purchase and use of electric cars

Green license plates

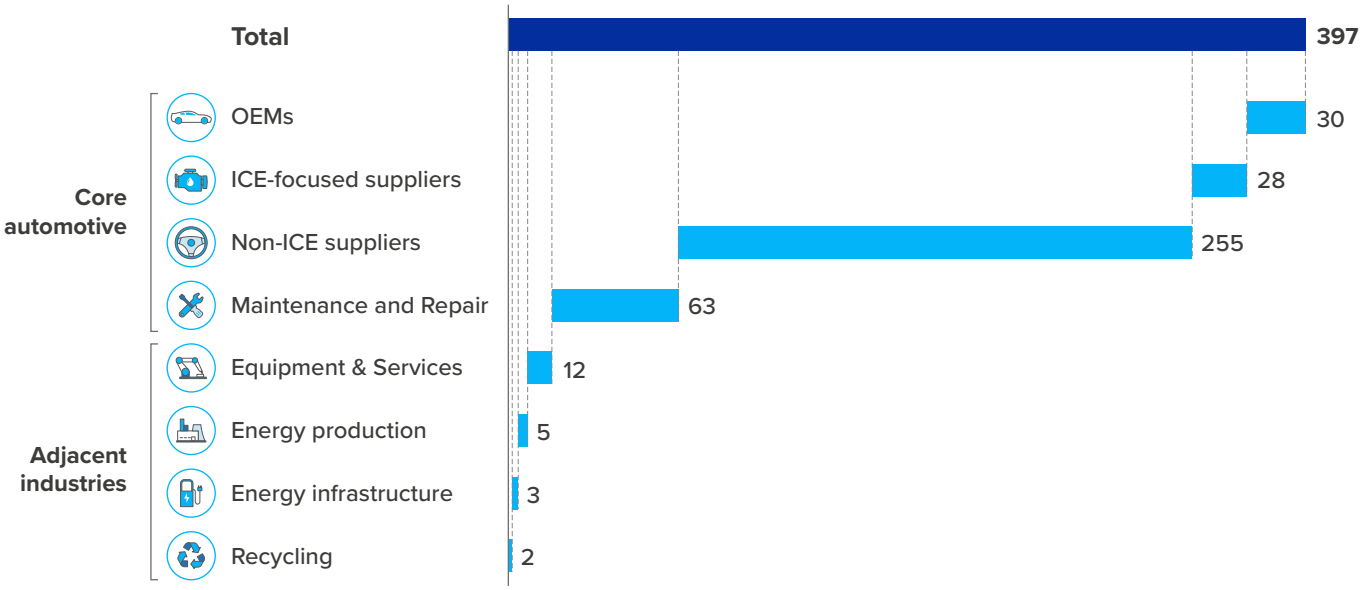
From January 1, 2020, battery-electric vehicles (BEV) and hydrogen vehicles (FCEV) in Poland receive green registration plates facilitating the identification of a zero-emission vehicle on the road



13 HOW WILL E-MOBILITY CHANGE THE POLISH LABOUR MARKET?

WILL LABOUR SHORTAGE BE AN ISSUE?

Number of employees (2020, in thousands)



ICE – internal combustion engine; OEM – original equipment manufacturer

The development of electromobility in Poland may contribute to the creation of up to 6,000 new jobs

2030 figures shown	Production volume	Sales volume	BEV car parc	Public charging	Private charging	Net job impact
Pessimistic scenario	604k	584k	751k	95k	450k	-17k
Intermediate scenario	621k	604k	905k	95k	543k	-5k
Ambitious scenario	660k	626k	1,023k	95k	1,110k	+6k

Source of data: "How will e-mobility change the Polish labour market? Green sectors of the future" report by BCG & PSPA

INVESTMENT POTENTIAL OF THE E-MOBILITY INDUSTRY IN POLAND

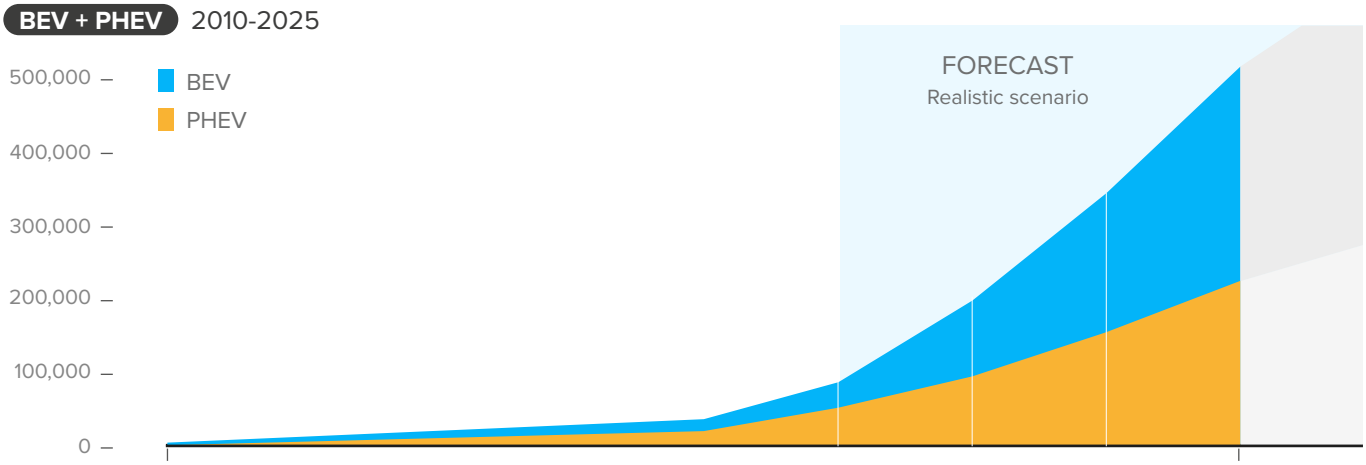
14 INVESTMENT POTENTIAL OF THE E-MOBILITY INDUSTRY IN POLAND

FORECAST FOR THE DEVELOPMENT OF E-MOBILITY IN POLAND

The Polish e-mobility sector is currently at the initial stage of development. Due to the size of the Polish automotive market and the significant potential for its electrification, this is an opportunity for foreign e-mobility companies implementing investments in Poland. Already in 2024, BEV's share of the new passenger vehicles market in Poland may reach over 10%, i.e. higher than the EU average in 2021.

Electric vehicle fleet in Poland

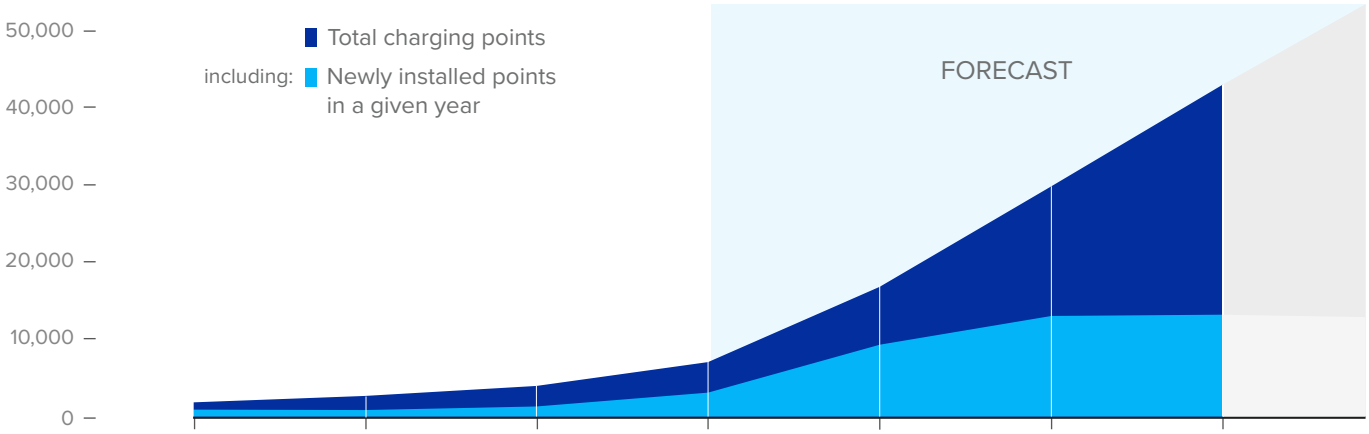
BEV + PHEV 2010-2025



	2010	2022	2025
BEV	20	40.3k	290.5k
PHEV	1	41.1k	220.2k
Total	21	81.4k	510.7k

Network of charging points in public stations in Poland

AC + DC 2019-2025



2019	2022	2025
1.8k	5.5k	41.9k
0.9k	1.8k	13.8k

Source of data: "Polish EV Outlook 2022" PSPA

OPPORTUNITY 1

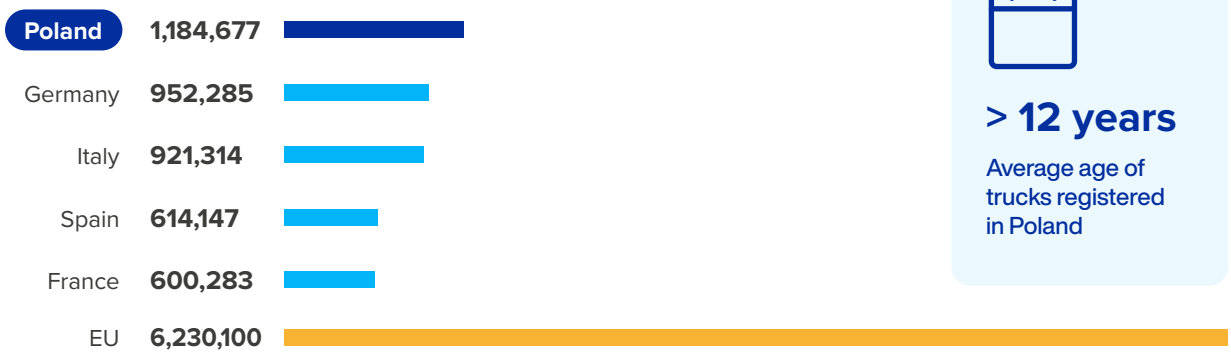
ELECTRIFICATION OF THE COMMERCIAL VEHICLE SECTOR

There are more than 6.2 million medium and heavy commercial vehicles on EU roads, up 1.7% compared to 2019. With around 1.2 million trucks, Poland has the largest fleet by far.

Poland as the European center of heavy road transport

One in every 5 trucks and vans with a GVW over 3.5 t in the EU is registered in Poland

Truck fleet in Europe (over 3.5 t)
TOP 5



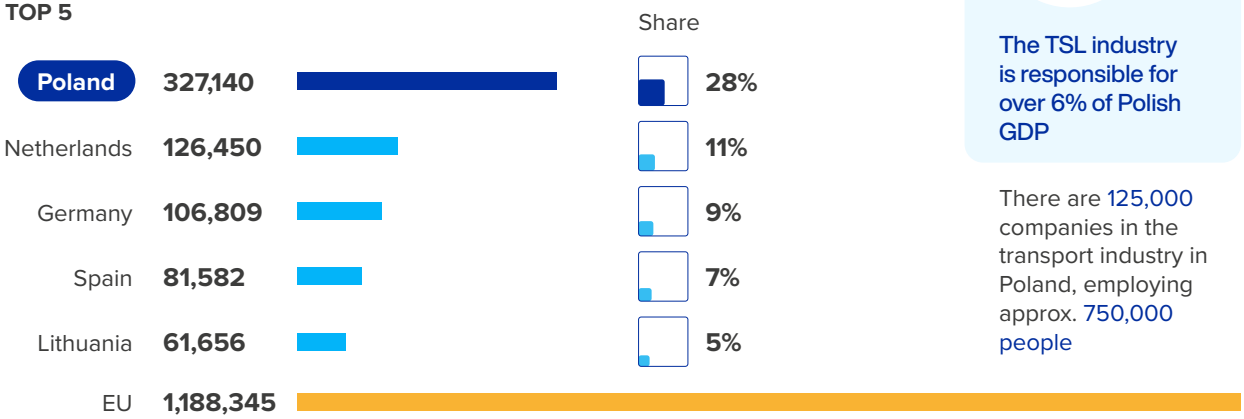
> 12 years

Average age of trucks registered in Poland

Source: ACEA

In 2020 Polish carriers transported almost 330 million tons of cargo

The weight of transported cargo
TOP 5



6%

The TSL industry is responsible for over 6% of Polish GDP

There are 125,000 companies in the transport industry in Poland, employing approx. 750,000 people

Source: Eurostat, Employers' Association "Transport and Logistics Poland"

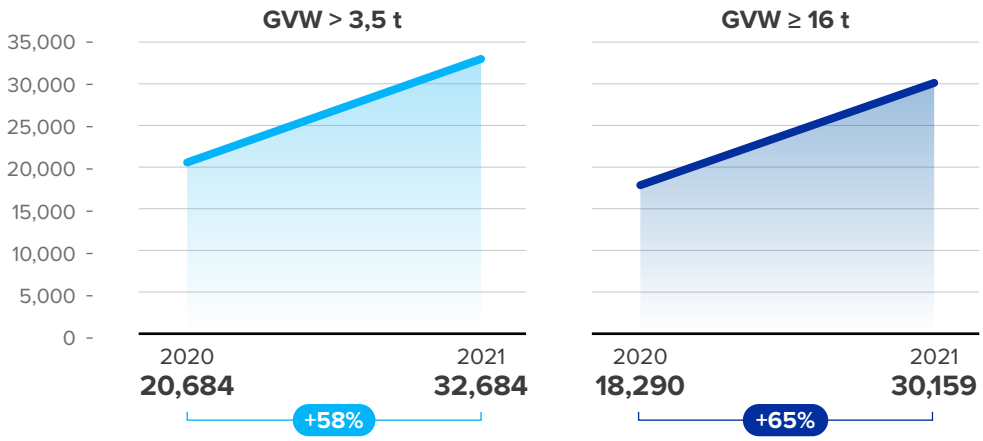
OPPORTUNITY 1

ELECTRIFICATION OF THE COMMERCIAL VEHICLE SECTOR cont.

Poland as the European center of heavy road transport

In 2021, almost 33,000 trucks were registered in Poland – the highest figure in history

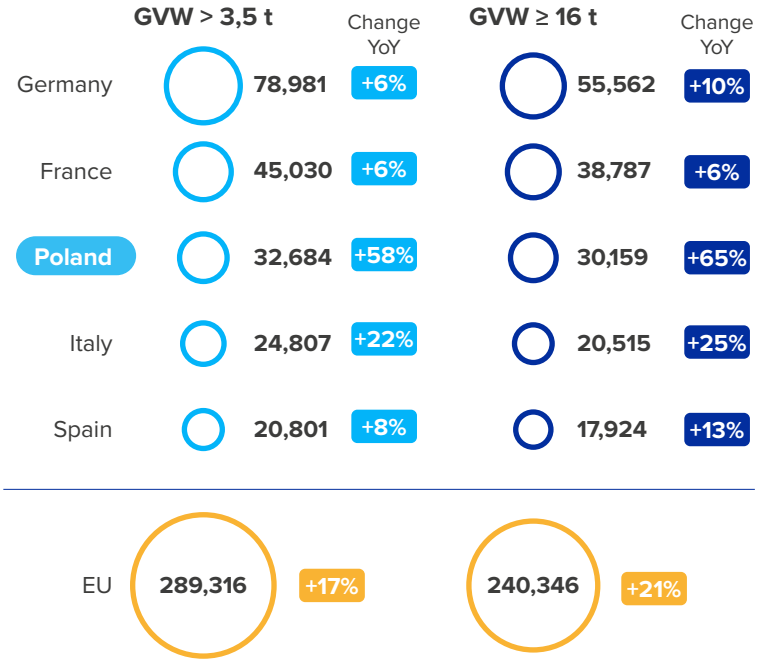
First registrations of new trucks in Poland



Source: PZPM based on Central Vehicle Register (CEP)

3rd place in the EU in terms of the new heavy-duty vehicles registrations

First registrations of new trucks in Europe
TOP 5



Source: ACEA

Due to the low share of electric cars in the commercial vehicle fleet, its electrification potential is very high

Delivery and heavy-duty electric vehicles

Fleet

2,202

→ including:
only 4 vehicles
with a mass over 16 t

Newly registered delivery and heavy-duty electric vehicles (new and used)

I-VII 2021	I-VII 2022
221	707

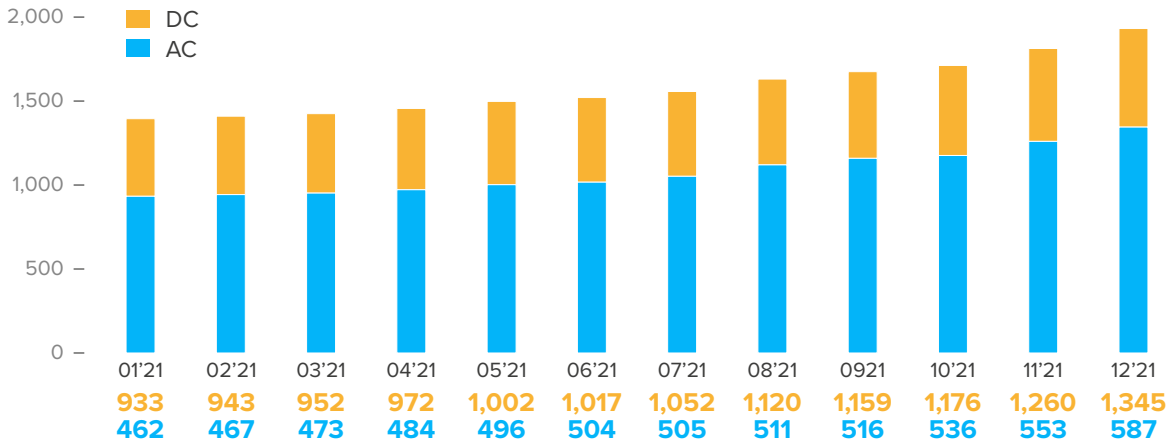
+220%

OPPORTUNITY 2

EXPANSION OF THE PUBLIC CHARGING STATION NETWORK

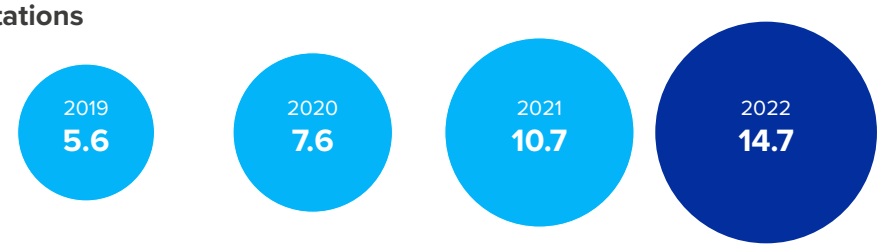
At the end of 2021, there were only 1,932 public charging stations (3,784 points) in Poland. Considering the very dynamic development of the EV fleet and the size of the automotive market, the Polish charging infrastructure network has a great potential for expansion.

1 / Increase in the number of charging stations in Poland in 2021

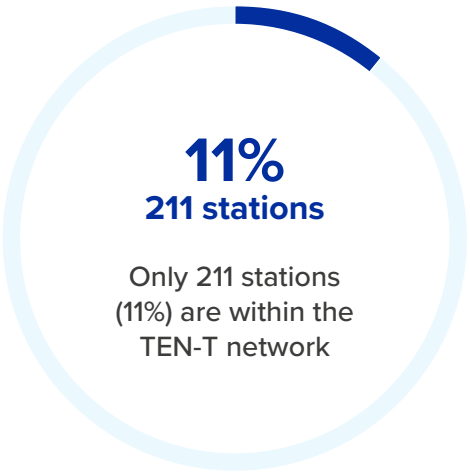


2 / The pace of electrification of the car fleet in Poland is much higher than the pace of expansion of public charging stations

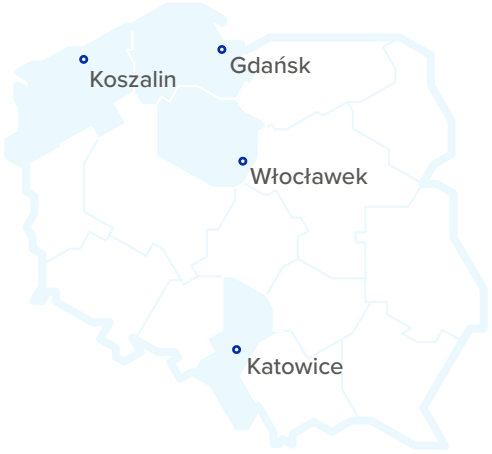
Number of electric cars per 1 public charging point



3 / TEN-T Network



4 / Obligations imposed by the Act on electromobility and alternative fuels



Only 4 cities with > 100,000 residents (Gdańsk, Katowice, Koszalin and Włocławek) have met the requirement imposed by the Electromobility Act regarding the minimum number of charging points

OPPORTUNITY 2

EXPANSION OF THE PUBLIC CHARGING STATION NETWORK cont.

5 / The AFIR project – the need to increase the power of public charging stations networks

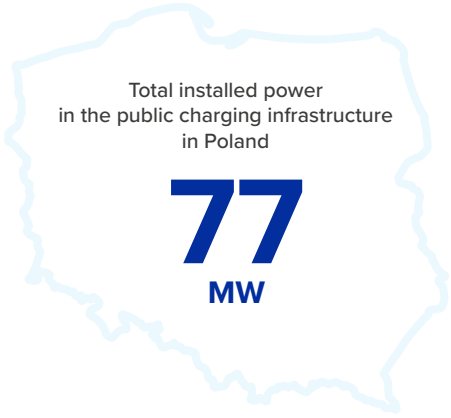
→ Part of the "Fit for 55" package presented by the European Commission

→ It will replace the Directive 2014/94 / EU of the European Parliament and of the Council of 22 October 2014 on the development of alternative fuels infrastructure

→ It links the development of the EV fleet with the need to increase the power in the public charging infrastructure network

Installed power in relation to the size of the fleet (BEV + PHEV)

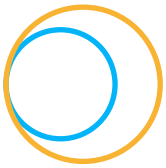
	2025	2030	2035
AFIR Basic text	**435,8 MW**	**1383,5 MW**	**2613,1 MW**
European Parliament Committee on Transport and Tourism Amendments	1166,7 MW	2773,6 MW	4316,1 MW
European Council Compromise proposal	**435,8 MW**	**1383,5 MW**	**2613,1 MW**



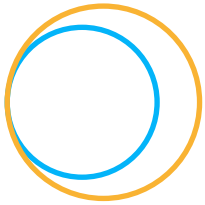
→ AFIR forces the necessity to increase the power in the Polish public charging infrastructure network

By 2025
6-15x

By 2030
18-36x



By 2035
34-56x

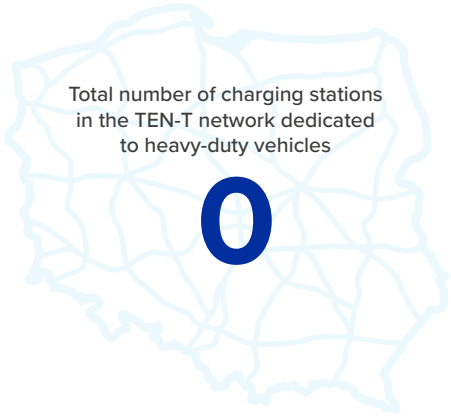


6 / The AFIR project – the need to expand the charging stations network for electric trucks

Development of charging infrastructure for heavy-duty transport

	2025	2027	2030
Core TEN-T network	At least **1,400 kW** charging power every **120 km** at **15%** the length of the entire TEN-T network	At least **2,800 kW** charging power every **120 km** for **40%** the length of the core TEN-T network	Charging station every **60 km** of power at least **3,500 kW** with at least 2 connectors with a power **350 kW**
Comprehensive TEN-T network		At least **1400 kW** charging power every **120 km** for **40%** the length of the comprehensive TEN-T network	Charging station every **100 km** of power at least **1,400 kW** with at least 2 connectors with a power **350 kW**

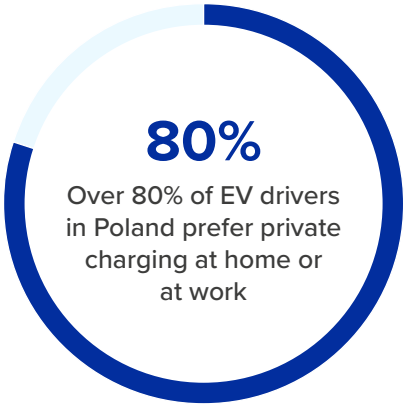
Targets based on the EU Member State compromise on AFIR

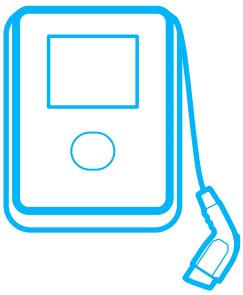


OPPORTUNITY 3

PRIVATE CHARGING STATION MARKET

Over 80% of EV drivers in Poland prefer to charge their vehicles at home or at work. Along with the forecasted dynamic development of the EV fleet (over 500,000 registered BEVs and PHEVs in total by 2025), the private charging station market will grow significantly in the coming years.





The potential of the Polish private charging infrastructure market

115,000

charging points by 2025

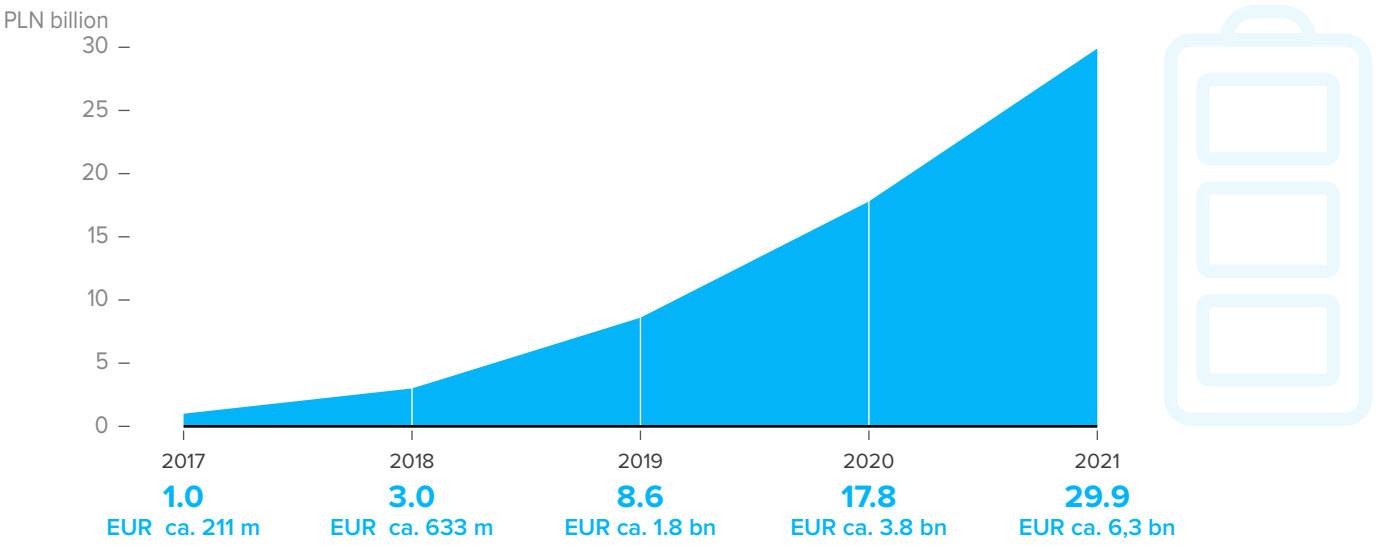
Source of data: "Polish EV Outlook", PSPA

OPPORTUNITY 4

LITHIUM-ION BATTERY SECTOR

Lithium-ion batteries account for over 2% of total Polish exports. The value of exports in this sector increased from approximately PLN 1 billion (EUR ca. 211 million) in 2017 to nearly PLN 30 billion (EUR ca. 6,3 billion) in 2021.

Export value of lithium-ion batteries in Poland (PLN billion)



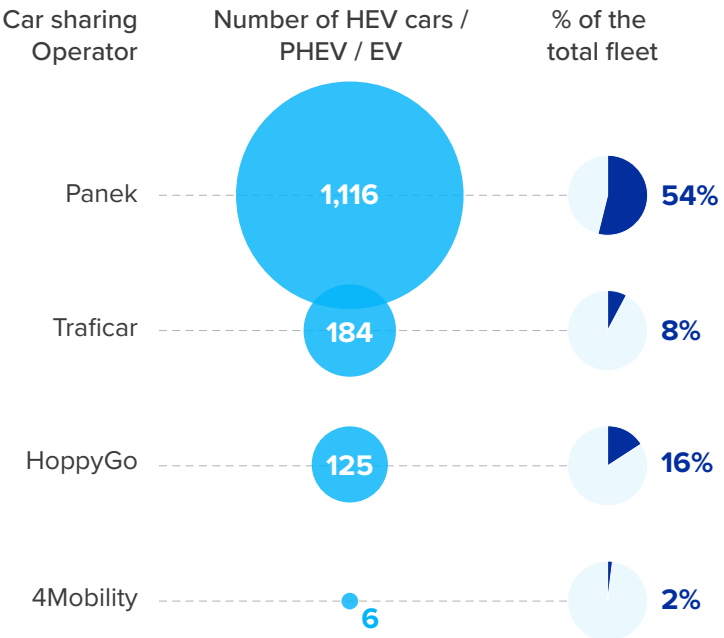
Source of data: Central Statistical Office

OPPORTUNITY 5

SHARED MOBILITY PROJECTS

In 2021, over 25 million passenger cars were registered in Poland. One shared vehicle could replace up to 7-11 private cars. Meanwhile, there are less than 1.5 thousand electrified cars on Polish roads available in car-sharing systems. In few cities, the services of sharing scooters, bicycles and electric mopeds are also available, although the micromobility market is developing very dynamically.

1 / Car sharing



Source of data:
Mobile City Association

2 / Scooters

149

cities in Poland have scooter sharing services

2.5x

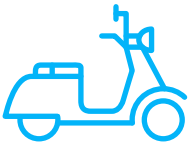
increase (YoY)

3 / Bike sharing

89

cities in Poland have bike sharing services

4 / Electric Moped sharing



13

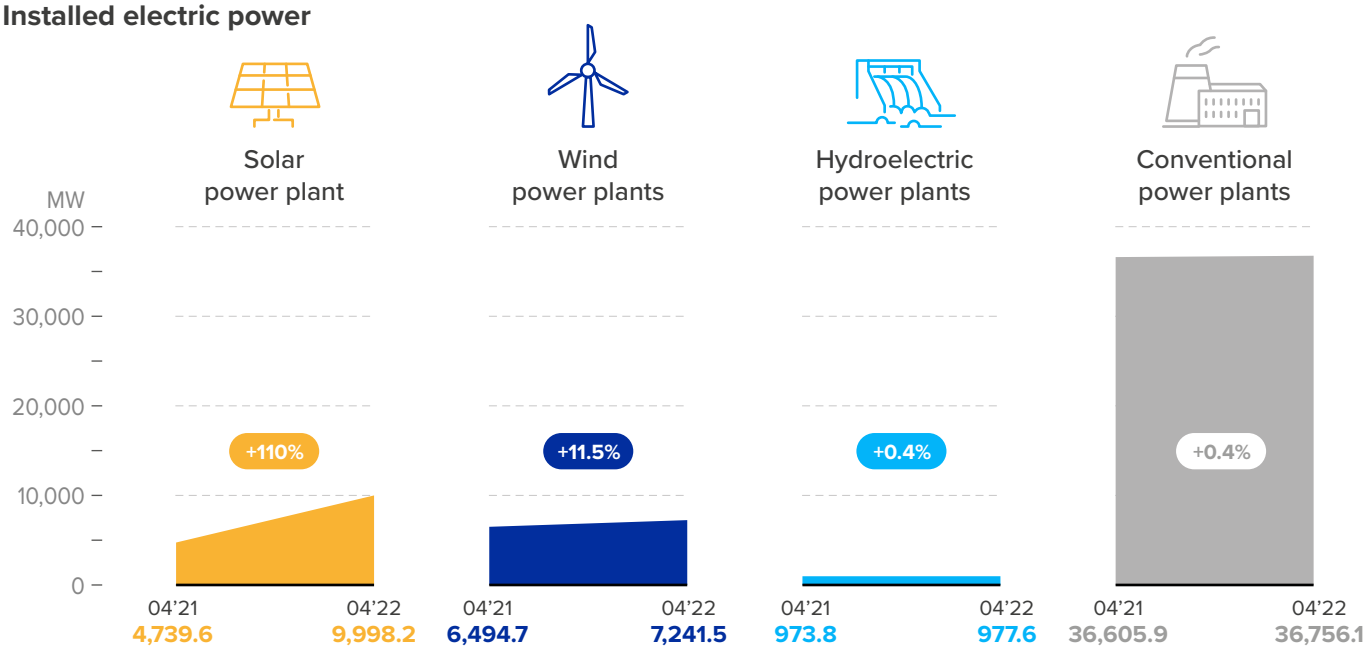
cities in Poland have electric moped sharing services

OPPORTUNITY 6

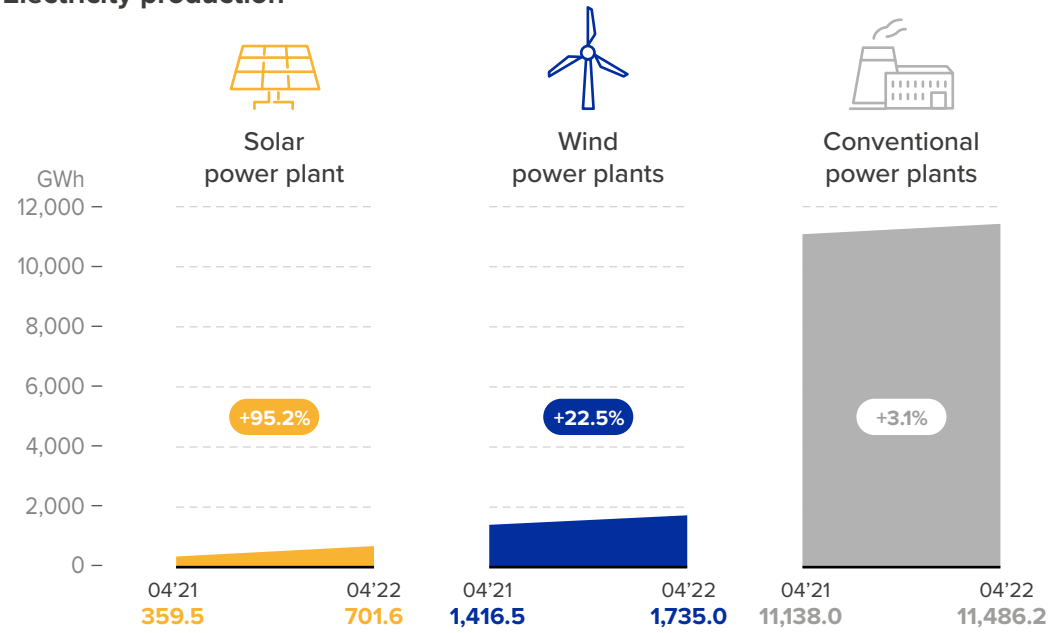
RENEWABLE ENERGY SOURCES

Although conventional power plants still dominate the Polish energy mix, the share of energy obtained from renewable sources is systematically growing. This is an opportunity for companies offering innovative solutions in the renewable energy sector.

Installed electric power



Electricity production



Source of data: Energy Market Agency (ARE)

ASSESSMENT OF THE INVESTMENT POTENTIAL IN PARTICULARLY PROSPECTIVE E-MOBILITY AREAS IN POLAND

Scale 1 – Lowest 2 3 4 5 6 7 8 9 10 – Highest

Area	Potential for further development	Competition level
Electrification of heavy road transport	/ 10 › The largest truck fleet in the EU › Very low market share of eHDV › Progonosis of a very dynamic development of the sector in the following years	/ 3 › The presence of leading concerns in the HDV segment with very limited eHDV market offer
Expansion of the public charging station network	/ 10 › Dynamic development of the electric car fleet › Availability of subsidy programs by public administration › Progonosis of a very dynamic development of the sector in the following years	/ 6 › The presence of Polish and foreign operators of the charging infrastructure
Private charging station market	/ 10 › Dynamic development of the electric car fleet › An insufficiently developed network of public infrastructure encourages the purchase of private chargers › Progonosis of a very dynamic sector development in the following years	/ 7 › The presence of Polish and foreign companies offering charging stations for private use
Lithum-ion battery sector	/ 10 › Existing factories are conducive to the implementation of related investments › Poland's strategic location stimulating exports › Availability of investment incentives from public administration	/ 1 › The presence of a number of companies from the global supply chain of li-ion batteries and related components, which direct the vast majority of production to foreign markets ensuring constantly growing demand
Shared Mobility Projects	/ 7 › Low saturation of shared mobility services in many municipalities › Industry-driven implementation of regulations supporting the development of new mobility › Systematically growing costs of owning private vehicles	/ 4 › High rotation and market division between large entities with a stable position and aspiring start-ups
Renewable Energy Sources	/ 8 › The energy mix is still based on coal › Efforts by public administration to limit the independence of the energy sector from imported fossil fuels › Striving of public administration to diversify energy sources	/ 6 › The presence of Polish and foreign companies offering innovative solutions from the renewable energy sector

PUBLISHER

Polish Alternative Fuels Association (PSPA)

pspa.com.pl

EDITORS

Jan Wiśniewski, Klaudia Zagorzycka, Albert Kania

Łukasz Witkowski
Operations Director, PSPA

CONTENT DEVELOPMENT AND DATA AGGREGATION

F5A New Mobility Research & Consulting

F5A New Mobility Research & Consulting

GRAPHIC DESIGN AND COMPOSITION

Magda Furmanek

Warsaw 2022

pspa.com.pl