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## Statistics for the European Green Deal **Electric vehicle charging statistics**



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# Background

As outlined in the European Green Deal, the goal is to achieve a 90% cut in emissions by 2050, delivered by a smart, competitive, safe, accessible and affordable transport system.

The objective of the project is the collection of information on the quality of electric and hybrid vehicles and charging infrastructure, and development of new methodology for calculating electricity consumption in transport.

The project covers three main tasks:

- Collecting the information on charging stations at regional level.
- Develop data production system for calculation of energy used by electric vehicles, both private and public.
- Produce estimates of the transition from fossil fuels to electricity for mobility needs. Make estimates of the future increased total generating capacity.



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## Activities carried out in the frame of the project

- Improvement of the calculation of electricity consumption in transport and consumption analysis over the last five years.
- Analysis of the possibility of data calculation for electricity consumption and raising the main issues in collecting such data.
- Communication with the administrative data provider to identify the main problems and challenges in preparing this data.
- Compilation of data for last five years (2017-2021) on number of electric vehicles, milage and energy used in electric vehicles by NACE and households, combining administrative data sources and energy consumption surveys.



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## Number of vehicles registered in Latvia

Vehicle type	2017	2018	2019	2020	2021
2-3 wheelers	52 832	55 898	60 416	64 421	69 115
Passenger cars	689 536	707 841	727 164	739 124	758 688
Buses and Coaches	4 701	4 632	4 549	4 383	3 992
Light goods vehicles	55 557	57 146	59 291	60 696	63 078
Heavy goods vehicles	17 274	17 283	17 134	17 127	16 818
Tractors	14 312	14 782	14 886	14 676	14 915
<b>Total</b>	<b>834 212</b>	<b>857 582</b>	<b>883 440</b>	<b>900 427</b>	<b>926 606</b>

Source: TRT Elaborations on CSB data



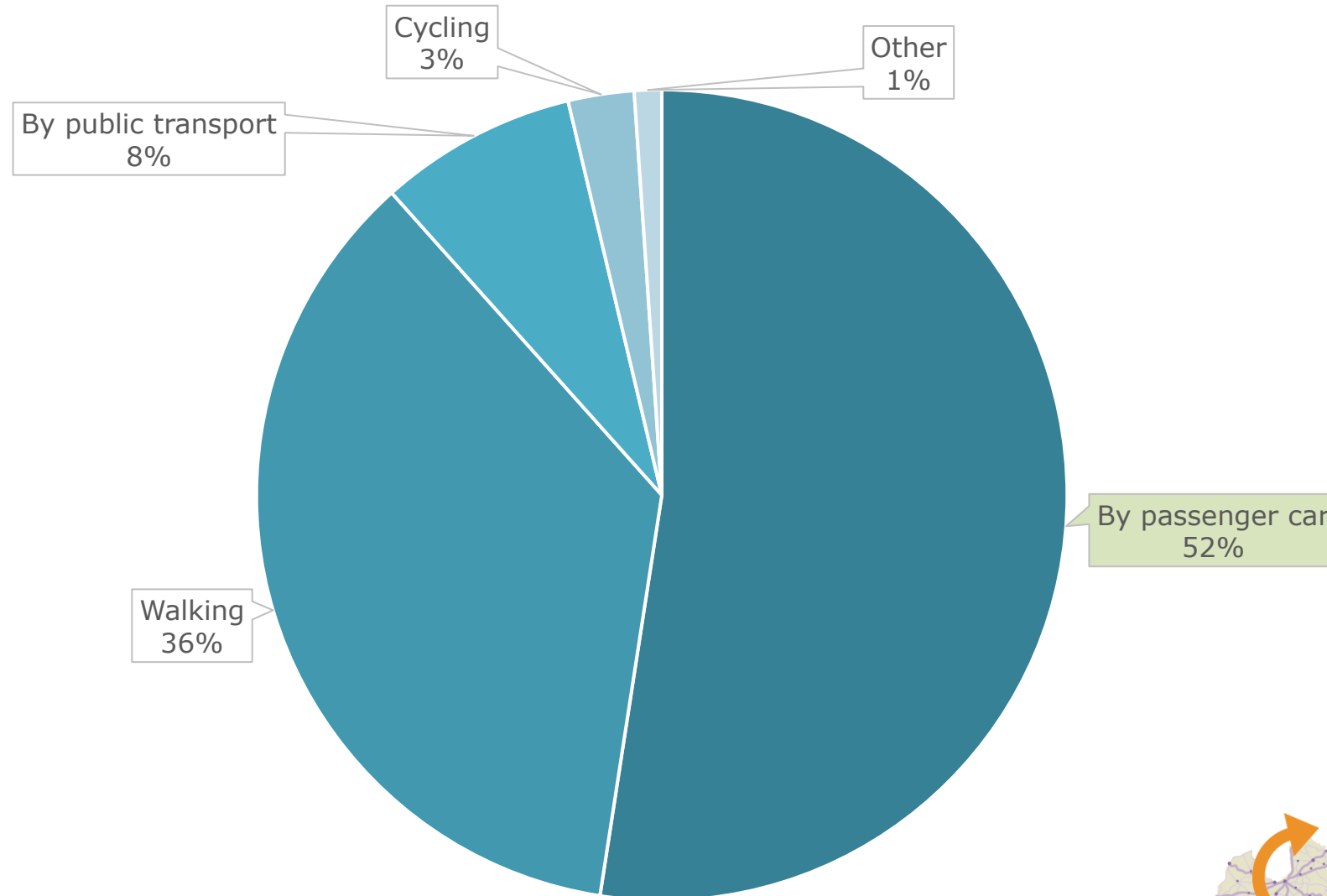
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## Number of trips (<300 km) per year by main mode of transport in 2021 (%)



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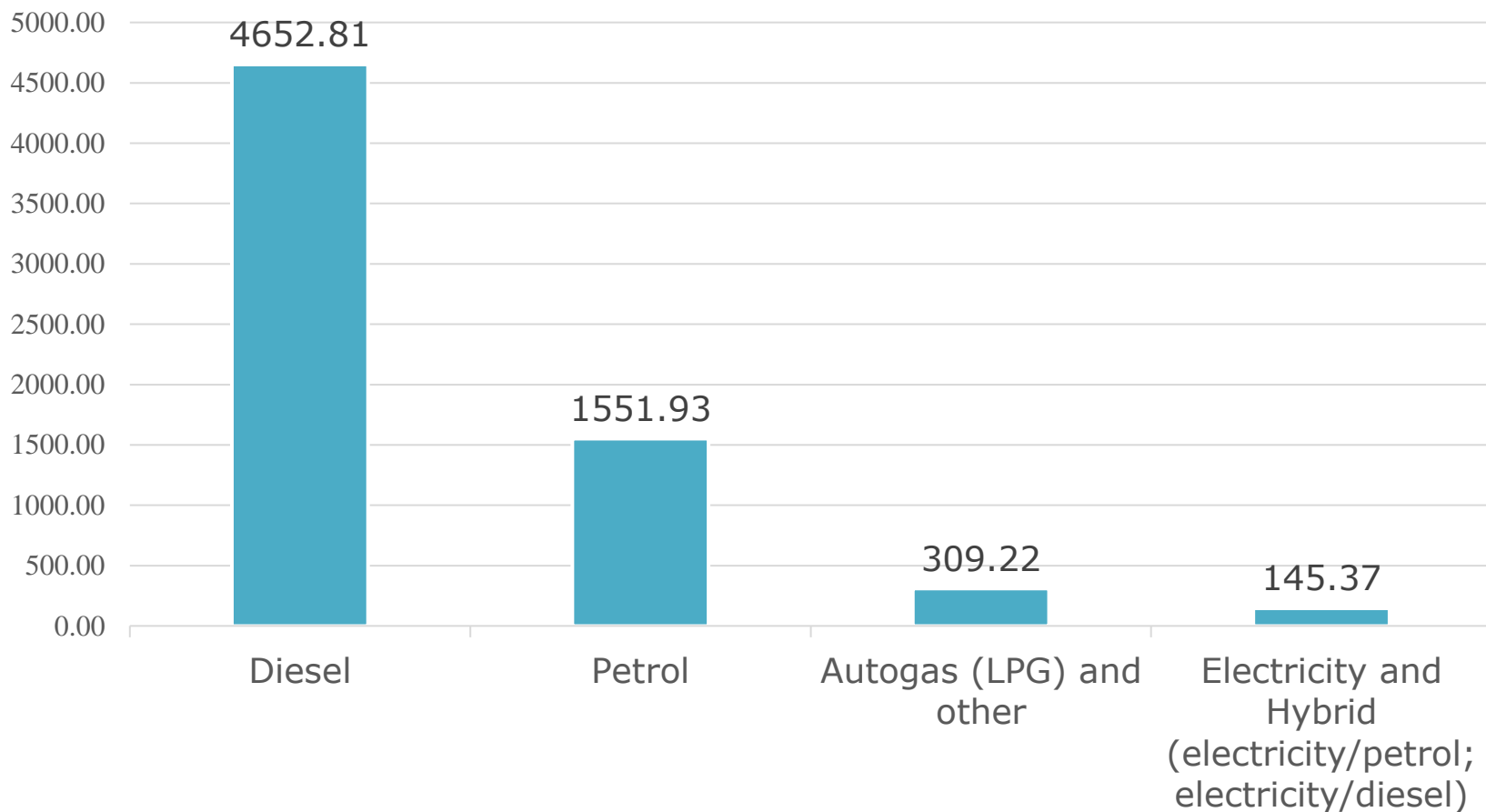


Mobility of  
Latvian  
population  
2021



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## Passenger-kilometers in 2021 by fuel type used in passenger car (in millions)



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Mobility of  
Latvian  
population  
2021



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## Battery Electric Vehicles registered in Latvia

Vehicle type	2017	2018	2019	2020	2021
2-3 wheelers					42
Passenger cars - private	59	113	223	453	958
Passenger cars - company	250	331	442	776	1 174
Buses	1	5	8	8	41
Coaches					
Light goods vehicles	13	14	16	36	69
Heavy goods vehicles					
Tractors					
<b>Total</b>	<b>323</b>	<b>463</b>	<b>689</b>	<b>1 273</b>	<b>2 284</b>

Source: TRT Elaborations on CSB data



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## Share of registered Battery Electric Vehicles in Latvia

Vehicle type	2017	2018	2019	2020	2021
2-3 wheelers	0.0%	0.0%	0.0%	0.0%	2.2%
Passenger cars	0.2%	0.8%	1.2%	4.1%	6.2%
Buses and Coaches	0.3%	2.3%	2.3%	0.0%	12.8%
Light goods vehicles	0.0%	0.0%	0.1%	0.9%	1.3%
Heavy goods vehicles	0.0%	0.0%	0.0%	0.0%	0.0%
Tractors	0.0%	0.0%	0.0%	0.0%	0.0%
<b>Total</b>	<b>0.2%</b>	<b>0.6%</b>	<b>0.9%</b>	<b>3.1%</b>	<b>4.8%</b>

Source: TRT Elaborations on CSB data



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## Distribution of electric vehicles in Latvia

In 2021 nearly 90% of electric vehicles are concentrated in the Rīga and Pierīga regions, accounting for respectively 75% and 14%.

NUTS 3	Electric cars	Population	E-Mot Rate
Rīga	1 622	614 618	2.6
Pierīga	314	378 982	0.8
Kurzeme	66	236 022	0.3
Latgale	30	252 682	0.1
Vidzeme	59	183 399	0.3
Zemgale	42	227 520	0.2
<b>Total</b>	<b>2 132</b>	<b>1 893 223</b>	<b>1.1</b>

Source: TRT Elaborations on CSB data



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## Charging facilities in Latvia

Latvia counts 361 charging stations in the whole country, with a total number of 1 370 charging points, meaning 3.8 charging point per station on average.

NUTS 3	Charging stations	Charging points	Aver. Points/station
Rīga	135	507	3.8
Pierīga	80	309	3.9
Kurzeme	45	180	4.0
Latgale	28	116	4.1
Vidzeme	32	116	3.6
Zemgale	41	142	3.5
<b>Total</b>	<b>361</b>	<b>1 370</b>	<b>3.8</b>

Source: TRT Elaborations on CSB data



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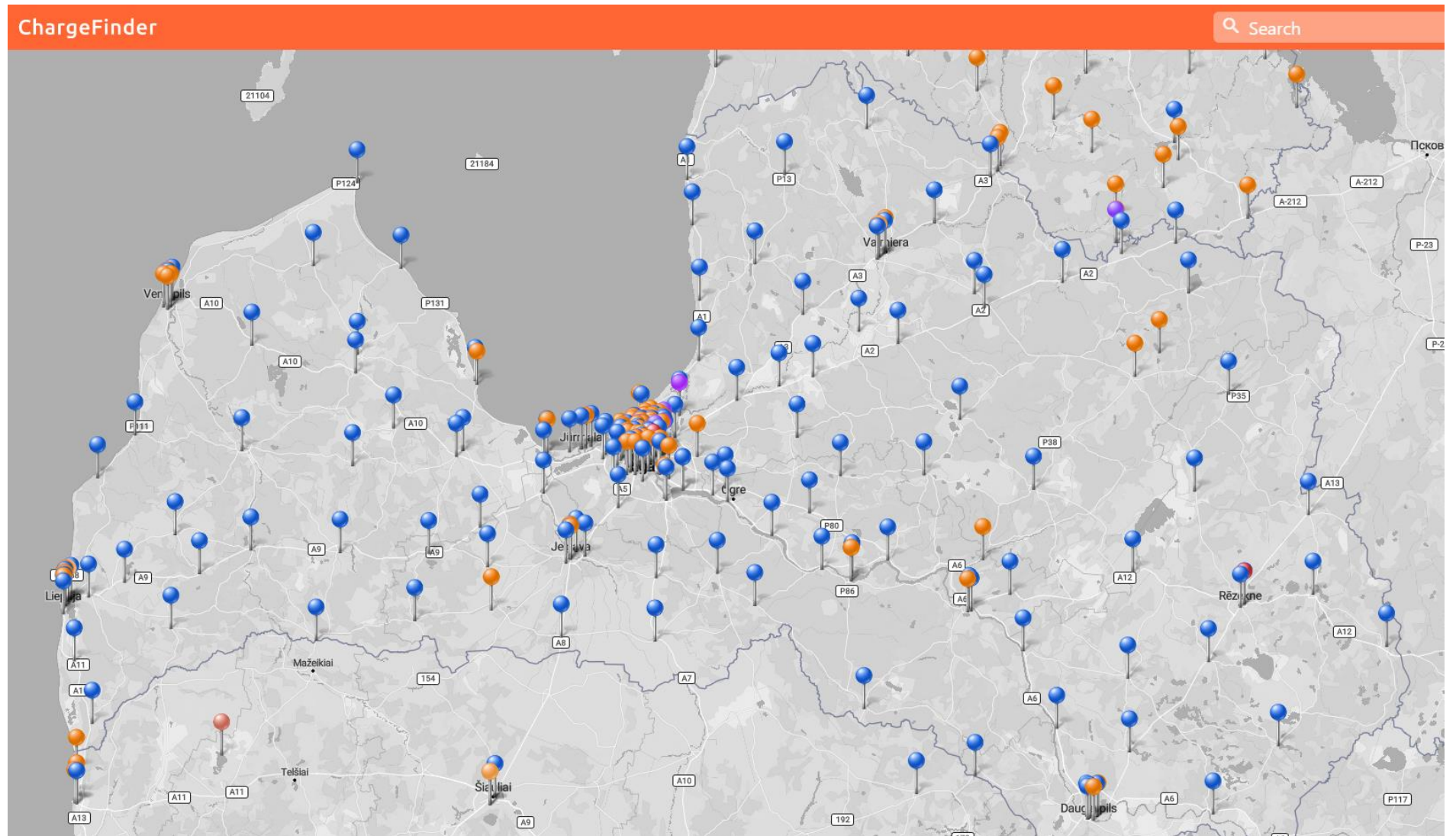




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## Vehicles per charging point

The distribution of charging points does not correspond with the number of electric cars distributed according to the “cars/point” indicator.

NUTS 3	Electric cars	Charging points	Cars/point
Rīga	1 622	507	3.2
Pierīga	314	309	1.0
Kurzeme	66	180	0.4
Latgale	30	116	0.3
Vidzeme	59	116	0.5
Zemgale	42	142	0.3
<b>Total</b>	<b>2 132</b>	<b>1 370</b>	<b>1.6</b>

Source: TRT Elaborations on CSB data



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## Average consumption of electricity by electric vehicles in Latvia

According to calculations the basic average electricity consumption by Battery Electric Vehicles is increasing every year. However, there are other factors to be considered in such estimations.

Year	Average consumption for passenger cars (kWh/km)
2017	0,159
2018	0,164
2019	0,172
2020	0,176
2021	0,177



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## External factors to be considered - Temperature of the air

- According Carleton University (Ottawa, Canada) air temperature, wind, rain considerably influence the maximum distance travelled on a single charge.
- Different tests have proved that negative temperature of **-7°C (19.4°F)** decreases distance travelled by **20%**.
- According to “Latvian Environment, Geology and Meteorology Centre” negative temperature in Latvia is present on average for **4 months** during a year.
- That means that average basic electricity consumption for electric vehicles in Latvia increases by at least **8,3%**.



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## Other factors

### Loss of battery capacity

- The main characteristics that affect the charging are the charging time, the type of charging (power of the charging point), as well as the ambient temperature.
- As a result of the calculations, it is concluded that the battery capacity losses in Latvia are on average **16.1%** of the calculated initial electricity consumption.

### Recuperation effect...

- ...recovery of kinetic energy released during braking or traction.
- It was calculated that the recuperation effect on the highway is **3%**, and in the city - **14%**.



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## Estimated electricity consumption by Battery Electric Vehicles in Latvia (MWh)

	MWh				
	2017	2018	2019	2020	2021
Total	715.37	1265.87	2543.45	4174.88	7992.45
Private vehicles	99.47	220.21	768.86	1219.56	2615.40
Commercial vehicles	615.89	1045.66	1774.59	2955.33	5377.05

In 2020, on average, a household consumed 175 kilowatt-hours (kWh) of electricity per month, which is 2,1 megawatt-hours (MWh) per year.

In 2020 electricity used by electric vehicles is equal to the amount of electricity used by an average of **1 988 households**.



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## According to calculations in 2021...

Emissions reduced:

- ✓ more than **19 thousand tons** of **CO<sub>2</sub>**
- ✓ nearly **3 tons** of **PM** (Particulate Matters)
- ✓ **73 tons** of **NO<sub>x</sub>** (Nitrogen oxides)
- ✓ more than **4 tons** of **VOC** (volatile compounds)



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## Future sustainability

- Data on electricity consumption will continue to be calculated using the method developed in the project.
- As municipalities involvement in climate neutrality policy increases, the information obtained will also be useful in the calculation of regional climate indicators for sustainable transport.
- Data publications based on the results of the action will increase availability of sub-national data. Availability of sub-national data will enhance the quality of spatial planning.



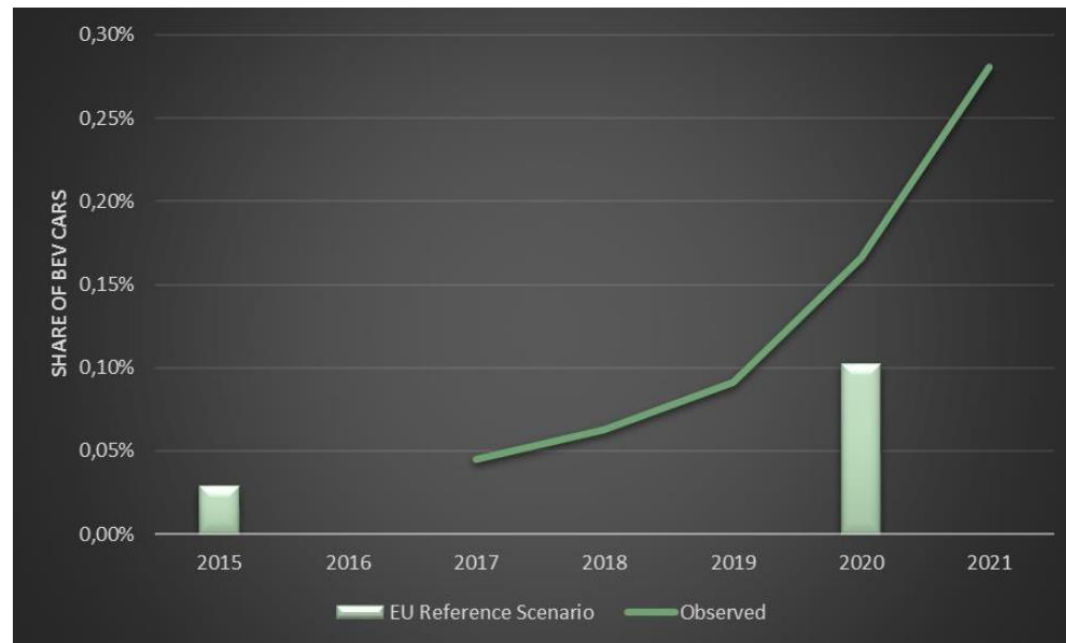
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When comparing the EU Reference Scenario figures against observed data, it can be noticed that the speed of the uptake of BEV cars in the fleet appears to be underestimated (Source: TRT elaboration on CSB data and EU Reference Scenario 2020 data).

Figure 2-1: Share of BE passenger car observed vs EU Reference scenario 2020



Source: TRT elaboration on CSB data and EU Reference Scenario 2020 data

	2025	2030	2035	2040	2045	2050
<b>Scenario 1</b>	1.8%	5.1%	9.7%	11.9%	13.3%	14.0%
<b>Scenario 2</b>	1.8%	5.3%	11.0%	14.8%	18.2%	21.4%
<b>EU Reference Scenario</b>	0.13%	3.2%	6.8%	9.1%	11.2%	13.1%

Source: TRT elaboration



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## Future scenarios – number of electric vehicles

This estimation is made by applying the calculated shares to the total size of Latvian car fleet as estimated in the EU Reference scenario.

Depending on the scenario, the number of battery electric cars is expected to be between 20 and 35 thousand in the year 2030 and between 81 and 139 thousand in the year 2050.

	2030	2040	2050
<b>Scenario 1</b>	33 828	75 321	90 760
<b>Scenario 2</b>	35 181	93 266	138 846
<b>EU Reference</b>	20 554	54 489	81 119

Source: TRT elaboration



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**Comments welcome!**



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