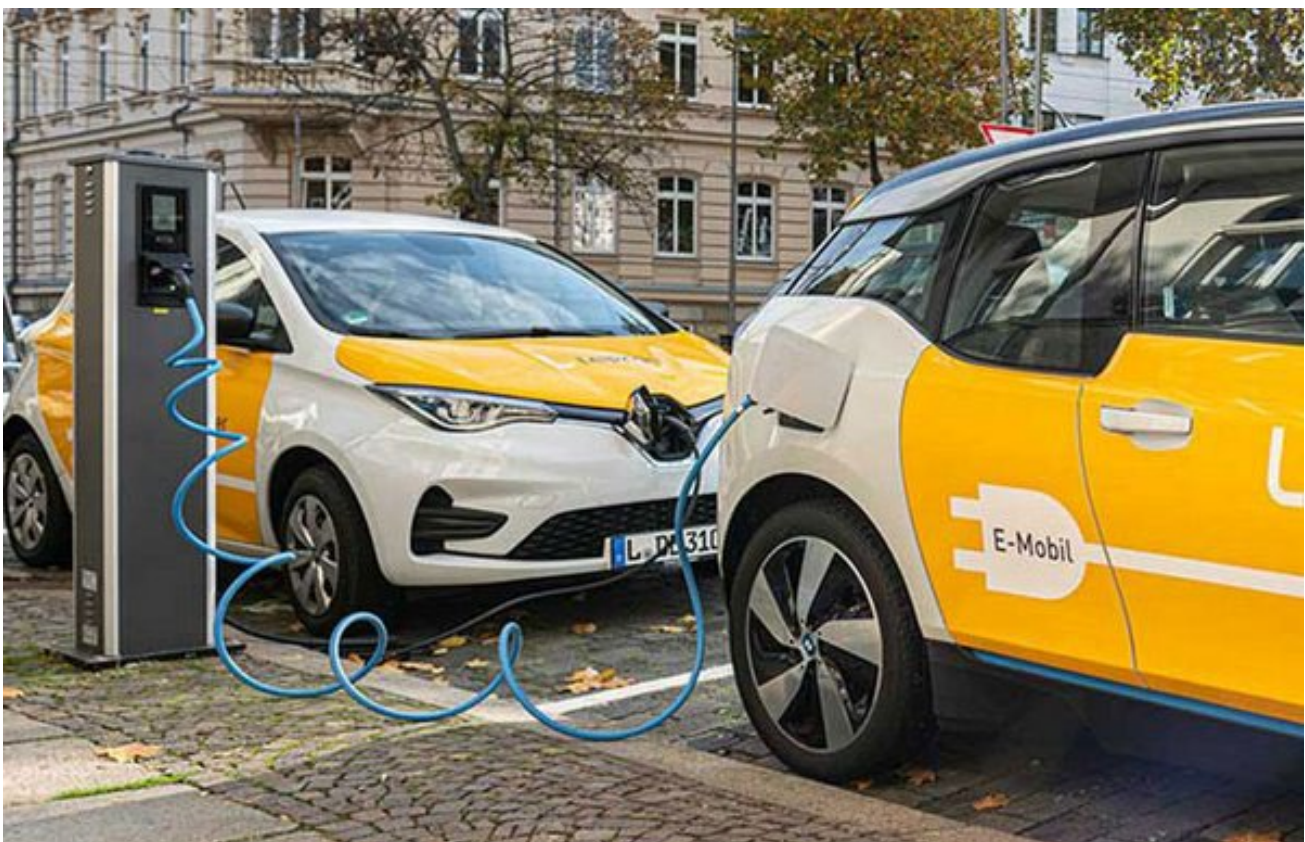




Action Plan for the City of Leipzig

2050 CliMobCity: Strengthening Charging Infrastructure for Climate Neutral Urban Mobility





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1. Part I – General information

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*This is the reformatted web-version of the Action Plan.
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2. Part II – Policy context

2.1 Addressed policy instrument

The City of Leipzig addresses the *Measures and Implementation Concept "Leipzig - City for Intelligent Mobility"*.

The policy was developed in 2017 to transform Leipzig towards a leading city of intelligent mobility (post fossil) in Germany. It includes a wide range of concrete measures which should be implemented to reach this target. Each defined measure includes the description, objectives, initiator, responsibilities, partners, scheduling, financing and costs. The policy is aimed to be improved in 2022 due to fast changing framework/market conditions (e.g. technological development of charging infrastructure and legislation).

2.2 Introduction

As part of the 2050CliMobCity project, policy instruments are being further developed to improve electromobility and sustainable mobility planning in various European regions. The concept "Leipzig - City for Smart Mobility" adopted in 2017 represents this policy instrument for Leipzig and will be updated this year.

The update of the measures and implementation concept was influenced by the 2050CliMobCity project. In the project, under the consortium leadership of the Delft University of Technology, the City of Leipzig is acting as one of the seven partners. The project aims to support political decision-makers in identifying, planning and implementing mobility strategies in order to achieve the respective long-term climate goals.

2.3 Regional Background

The population of cities in Europe is increasing. This trend holds true for the three biggest Saxon cities Chemnitz, Dresden and Leipzig, too. However, it is the opposite for the other regions, on average. For Leipzig, the number of inhabitants increased from 551,871 in 2014 to 597,493 in 2020 (as of each year's 31.12.¹). Speaking in relative terms, this is an increase of about 8.1%. In comparison, the number of inhabitants in Germany increased from 81.198mio. in 2014 to 83.155mio. in 2022. This is an increase of about 2.41%². These expectations give the City of Leipzig a special role in the state of Saxony and the region of central Germany. Leipzig and the surrounding region consequently become a pioneer example when addressing the selected policy instrument within this action plan.

¹ <https://statistik.leipzig.de/statcity/table.aspx?cat=2&rub=4&per=q> (retrieved on 21.04.2022)

² <https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bevoelkerung/Bevoelkerungsstand/Tabellen/liste-gebietstand.html> (retrieved on 21.04.2022)



Based on estimations from 2015, the predicted population development for the city of Leipzig until 2030 forecasts a population of about 680,000 inhabitants in the pessimistic scenario and 750,000 inhabitants in the optimistic scenario. With reference to the forecasted base case of 720,000 inhabitants, Leipzig will face an increase in its population of 30.5% from 2014 to 2030. In comparison, the predicted population development for Germany until 2030 forecasts a population of about 83.008mio. inhabitants in the pessimistic scenario and 84.422 inhabitants in the optimistic scenario. For the optimistic scenario, that will be an increase in Germany's population of 3.9%.³⁴

The population development in Leipzig strongly differs for certain age groups. The most rapid growing age group is the one of the elderly (90 years and older). Forecasts estimate an increase in 130% from 2015 to 2030. The second most rapid growing age group is the one of children of school age (6 to under 15 years) for which an increase of 60% from 2015 to 2030 is predicted. An increase above average is also predicted for the number of pre-school children (under 6 years of age) for which an increase of 35% from 2015 to 2030 is expected. On a regional level, the population development in Leipzig and its surrounding strongly differs, too. While the communities in the immediate vicinity of Leipzig are growing, a further decline in population is occurring in the more distant communities.⁵

As there is such an expected increase in population, the number of jobs in Leipzig is expected to increase significantly, too. However, this number of jobs is expected to grow less strongly than the number of inhabitants. This is forecasted for the number of employed people living in the city as well. Conversely, the number of jobs in the outlying areas of the city will not decline at the same rate as the number of inhabitants and employees. Some of these jobs will therefore be taken up by employees from the city of Leipzig. In the immediate vicinity of Leipzig, increasing numbers of jobs are expected, too.⁶ Thus, there will be an increase in commuting people.

The expected structural and economic development will lead to a significant increase in road traffic in Leipzig. This applies to both passenger traffic and commercial traffic. Thus, the number of vehicles in Leipzig is rising continuously, too. In 2017, there were 255,091 vehicles registered. Of these vehicles, 223,733 were passenger cars, of which 88.6% were private cars. So, private passenger cars account for 77% of all the registered cars. Out of the passenger cars, there were only 0.1% electric cars. The passenger car density in general at the end of 2017 was around

³ https://static.leipzig.de/fileadmin/mediendatenbank/leipzig.de/Stadt/02.1_Dez1_Allgemeine_Verwaltung/12_Statistik_und_Wahlen/Stadtforschung/Bevoelkerungsvorausschaetzung_2_016.pdf, p. 14 (retrieved on 21.04.2022)

⁴ https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bevoelkerung/Bevoelkerungsvorausberechnung/Publikationen/Downloads-Vorausberechnung/bevoelkerung-deutschland-2060-5124202199014.pdf?__blob=publicationFile; p. 9, 16 (retrieved on 21.04.2022)

⁵ Ibid. p. 17, 21

⁶ Industrie- und Handelskammer zu Leipzig. (2017). Studie zur Organisation des Stadtverkehrs in Leipzig unter besonderer Beachtung des Wirtschaftsverkehrs. p.6



379 cars per 1,000 inhabitants.⁷ Referring not to cars but to traffic, private passenger traffic accounts for 69% of the overall traffic whereas commercial traffic accounts for 31%.⁸

Accounting all types of mobility in a modal split, the car is the most frequently used means of transport. 38% of Leipzig's inhabitants used motorized individual traffic in 2017, followed by walking and cycling with 38% and public transport with 24%.⁹ So, the modal split for 2017 is roughly 60 to 40 when contrasting walking, cycling and public transport (summed up to environmental alliance) against motorized individual traffic. By 2025, the modal split is aimed at 70 to 30 according to Leipzig's urban development plan. According to this plan, the 70% should be composed of 27% foot traffic, 20% cycling and 23% public transport.¹⁰ Reducing motorized individual traffic is relevant, because CO₂-emissions caused by this type of traffic have been increasing since 1990 up to a maximum of 36% in 2011 (no more recent data available)¹¹.

Since going to work with a motorized vehicle is a habit for 45% of the commuters (2017), traffic has been increasing and will increase accordingly.¹² However, motorized traffic could be reduced by using more non-motorized vehicles such as bicycles because 50% (2015) of the work-related commuting distances in Leipzig are shorter than 5km.¹³ So, using more often non-motorized vehicles seems reasonable for people working and living in the city of Leipzig. Likewise, seems reasonable for incoming and outgoing commuters too since most of the distances in the city of Leipzig between place of living, station for public transport or place of work are less than 5km, too. Striving to achieve a modal shift to walking, biking and public transport could reduce CO₂ emissions but paired with the expected population growth would not be sufficient to achieve the CO₂ emission reduction targets. Therefore, electrification is an important development to pursue.

2.4 State of the art

The city of Leipzig has been very active especially in the field of electric mobility for years. This is reflected both in the commitment of fleet operators in the procurement of e-vehicles and in the

⁷ https://static.leipzig.de/fileadmin/mediendatenbank/leipzig-de/Stadt/02.1_Dez1_Allgemeine_Verwaltung/12_Statistik_und_Wahlen/Statistik/Statistisches_Jahrbuch_Leipzig_2018.pdf

p. 157 (retrieved on 21.04.2022)

⁸ Industrie- und Handelskammer zu Leipzig. (2017). Studie zur Organisation des Stadtverkehrs in Leipzig unter besonderer Beachtung des Wirtschaftsverkehrs. p.3

⁹ https://static.leipzig.de/fileadmin/mediendatenbank/leipzig-de/Stadt/02.1_Dez1_Allgemeine_Verwaltung/12_Statistik_und_Wahlen/Statistik/Statistisches_Jahrbuch_Leipzig_2018.pdf

p. 160 (retrieved on 21.04.2022)

¹⁰ Stadt Leipzig. (2016). Maßnahmen- und Umsetzungskonzept „Leipzig – Stadt für intelligente Mobilität“. Retrieved from Maßnahmen- und Umsetzungskonzept. P.25

¹¹ <https://www.leipzig.de/umwelt-und-verkehr/energie-und-klima/energie-und-klimaschutzprozess-eea/klimabilanz-fuer-leipzig/> (retrieved on 16.01.2020)

¹² https://static.leipzig.de/fileadmin/mediendatenbank/leipzig-de/Stadt/02.1_Dez1_Allgemeine_Verwaltung/12_Statistik_und_Wahlen/Statistik/Statistisches_Jahrbuch_Leipzig_2018.pdf

p. 160 (retrieved on 21.04.2022)

¹³ https://static.leipzig.de/fileadmin/mediendatenbank/leipzig-de/Stadt/02.6_Dez6_Stadtentwicklung_Bau/66_Verkehrs_und_Tiefbauamt/StEP/StEP_Verkehr.pdf p. 8 (retrieved on 21.04.2022)



development of the publicly accessible charging infrastructure that has taken place so far. Three market ramp-up scenarios are being developed for a broad market launch that is now imminent.

The following is a brief overview of the most important milestones. A detailed description of the activities to date in the form of offers and services, research programmes and projects, organisations, cooperation and events as well as municipal programmes and plans for the implementation of electromobility in Leipzig was provided in the holistic mobility concept "Leipzig - City for Intelligent Mobility" and the associated measures and implementation concept. The most important activities in the field of electromobility in the city of Leipzig include:

- The cluster policy, because electromobility is a focus of work in the energy and environmental technology cluster. It is based on the cluster strategy of the city of Leipzig. A cluster network and the Netzwerk Energie & Umwelt e. V. (Energy & Environment Network) were established for the strategic implementation of this goal. In addition to the Leipzig Economic Development Agency, cluster members are regional small, medium-sized and large companies as well as leading research institutes from the energy sector.
- Leipzig became the official lead region for electromobility as early as 2012.
- Since 2013, Leipzig has been an industrial location for the production of e-vehicles.
- Since 2014, the annual electric mobility rally "lipsia-e-motion" has taken place.
- In 2015, a survey of 500 companies was conducted by the Office of Economic Development in order to promote e-mobility in various fields and to initiate an e-alliance.
- The e-car rental service Strominator (now next move) has been operating in Leipzig since 2016.
- From 2015 to 2017, the measures and implementation concept "Leipzig - City for Intelligent Mobility" was developed after a long-term participation process.
- With the "new mobility" trade fair, the city of Leipzig is a trade fair location for e-mobility.
- The city of Leipzig enables companies to test e-vehicles through its SME support programme.
- The city administration and municipal companies already have well over 60 e-vehicles.
- Leipzig is already among the top ten German cities in terms of charging infrastructure.

In April 2020, the inventory of charging infrastructure comprises 110 locations (mostly charging columns) with a total of 369 charging points. The total capacity of all charging points is 6,804 kW. The main focus of the charging infrastructure is in the city district of Mitte. A total of 168 charging points can be found here. The district of Zentrum-Ost (including the main railway station) has the highest number of charging points, 61, of which 52 are privately operated. In the



centre of Leipzig, the number of publicly accessible charging points is highest with 28 charging points. In the centre-west and centre-northwest areas, the number of charging points is lower, at seven and eight respectively. A relatively high number of publicly accessible charging points can be found in the districts of Zentrum-Südost (21 charging points), Lützschena-Stahmeln (with freight centre, 16), Connewitz (11) as well as Paunsdorf, Zentrum-Süd and Seehausen (10 each).¹⁴

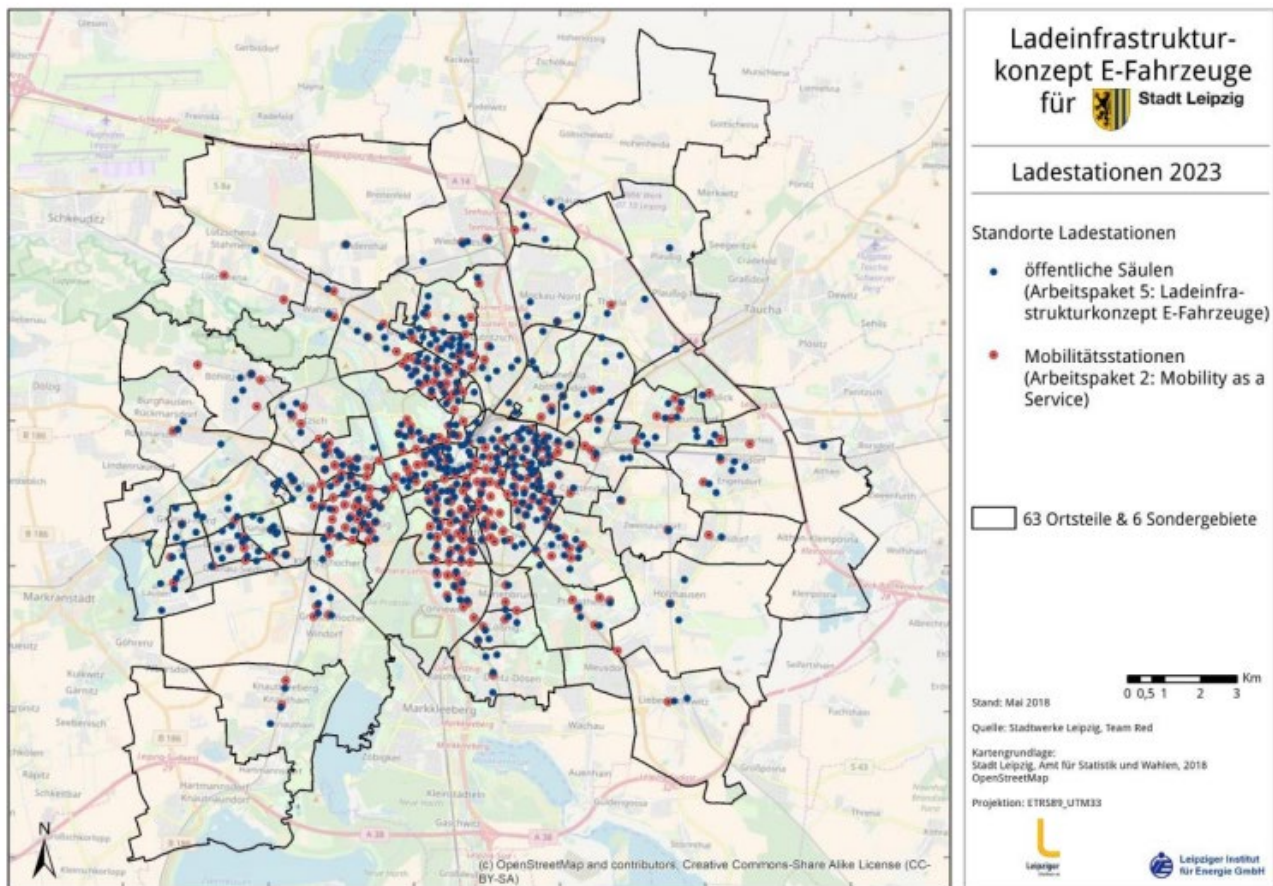


Figure: Forecasted charging stations in the city of Leipzig until 2023 - set out in the results of work packages 2 and 5 of the GreenCity Plan.¹⁵

¹⁴ Stadt Leipzig, Amt für Wirtschaftsförderung (Hrsg): Ladeinfrastrukturkonzept für E-Fahrzeuge in Leipzig im Rahmen des Green City Plan Leipzig. Redaktionsschluss: 07.07.2020, 82 Seiten, Leipzig 2020

https://static.leipzig.de/fileadmin/mediendatenbank/leipzig-de/Stadt/02.8_Dez8_Wirtschaft_Arbeit_Digitales/80_Amt_fuer_Wirtschaftsfoerderung/0_News/2020/568-Ladeinfrastrukturkonzept_Leipzig_2020.pdf (retrieved on 21.04.2022)

¹⁵ Ibis. P.6



3. Part III – Details of the actions envisaged

3.1 Actions

Without a comprehensive expansion of the charging infrastructure, there can be no widespread market ramp-up of e-mobility. The city of Leipzig has a lot of charging infrastructure due to a strong expansion of the charging infrastructure. However, this is not sufficient with regard to the predicted number of vehicles due to the market ramp-up of e-mobility, nor is it sustainable with regard to the availability of space. There is a deficit here that needs to be improved in a targeted manner, because an attractive charging infrastructure can serve as an incentive for the purchase of an e-vehicle. Further densification of the charging infrastructure will also be sought in the future via the German network.

Furthermore, public and semi-public charging infrastructure should be provided for commercial vehicles. Due to the often longer vehicles compared to passenger cars, the use of the existing charging infrastructure by commercial vehicles is only possible to a limited extent. A solution for this is explained in more detail in the measure profile "Adaptation of parking spaces to charging infrastructure for commercial vehicles". There is a further need for commercial providers to have their own or exclusive charging infrastructure at their respective commercial properties. The expansion should be pushed more strongly in the future and forms a field of action.

In order to be able to achieve a nationwide expansion of the charging infrastructure, specialized personnel is also needed for installation and advice. If this is not available, the expansion can be severely delayed. In addition, the process of planning the charging infrastructure is often uncoordinated. A supporting tool that records concrete needs is missing. The action plans developed are aimed at solving the above-mentioned challenges.

3.1.1. Action 1: Sharing of fast charging infrastructure on commercial properties

Intro

In addition to the models of the American company Tesla, which have been provided with high charging power of more than 100 kW at the specially installed Superchargers for years, other car manufacturers also offer vehicles for sale that can handle high charging power. High Power Chargers (HPC), for example, enable an energy supply of 150 up to 350 kW thanks to cooled charging cables. These fast-charging stations offer numerous advantages to commercial users of e-vehicles. One of the biggest advantages of a fast-charging station is that it makes it possible to supply an electric car with enough power to cover a distance of around 200 kilometres in less than an hour. With such a charging process using a fast-charging point, batteries can be full again within around 45 minutes. This means that deliveries over long



distances can be made more quickly with e-vehicles without major breaks, and it also makes long-distance journeys with e-cars possible, which previously required considerable effort.

However, fast charging stations are associated with high costs, so that individual companies and private individuals are reluctant to install this infrastructure. The solution to this problem can be a joint use of the stations by several companies and private individuals.

CliMobCity reference

The CliMobCity project enabled the city of Leipzig to present its ideas and plans for modern sustainable and future-oriented mobility at the European level and to gather feedback from various partners. This exchange encouraged Leipzig to continue on the path of e-mobility and to take further measures in this area. The presentation of already existing strategies of the partners played a special role, for example the plan of Plymouth to create 100 electric vehicle charging points before April 2020. The long-term policy on electric mobility including the development of charging infrastructure of the city of Utrecht also inspired Leipzig to take this measure. In Leipzig, they went one step further and included sustainability in the construction of the charging stations. By sharing the charging infrastructure, valuable raw materials and Co2 emissions are saved.

Action

New primary fast-charging infrastructure in the urban area is to be installed in newly constructed buildings or existing ones, or existing primary fast-charging infrastructure is to be offered to new users. Such developments will provide a high availability of fast-charging infrastructure while unit costs can be decreased by increasing the number of users. The fast-charging infrastructure can be installed both in public spaces and on private properties. Acceptance quotas can be agreed with anchor users with a high charging demand, thus achieving a more binding calculation basis for the operator. HPC charging infrastructure for businesses, occasional traffic and private users can thus be established sooner. Companies that already operate their own non-public fast charging infrastructure can make it available to other stakeholders outside of the usage times. The time slots can be set dynamically or fixed. The LGH Leipziger Gewerbehof GmbH plans to install such a charging station and will offer it to other commercial users as a pilot.

The demand for fast-charging options in the commercial sector can thus be met and an obstacle to acquisition removed. Existing funding programs for the installation of commercial fast charging infrastructure should be supported by funding from the city and the Free State, if necessary, in order to quickly provide a modern charging infrastructure (also in the inner-city area).

The action is to implement a pilot which can be serve as model for similar projects in the urban area. The pilot has been influenced by the learning in 2050ClimobCity and will support the updated 'Measures and Implementation Concept "Leipzig - City for Intelligent Mobility"'.



Responsible actor

Government Department, Office for Economic Development

Participants

- **Government Department**, Office for Economic Development
- **Commercial Owner of charging infrastructure** LGH – Leipziger Gewerbehof GmbH
- **Commercial Users of E-Vehicles**

Timeline and costs

Time	Milestone	Expected costs	external
Q3/2022	Kick-off meeting with project partners	No costs	
Q4/2022	Finishing of the planning concept	No costs	
Q2/2023	Start of construction	No costs	
Q3/2023	Finished charging Infrastructure	~10.000 EUR	
Sum		~10.000 EUR	

Financing

There will be no costs beyond regular staff costs associated with this action, as it is mostly awareness raising of the involved actors. The costs of the charging stations will be met by the owner of the property through local, regional and national funding. Therefore, the costs of the property owner would be lessened. A contribution of the other commercial users would also help financing these costs.

3.1.2. Action 2: Charging infrastructure for carsharing

Intro

Especially in urban areas, where residents drive on average 2,000 kilometers less than the rural population, car sharing is an interesting alternative. Car sharing vehicles are always available when there is a need and are used by other drivers the rest of the time. Carsharing users are almost as mobile as car owners, although fewer vehicles are in use. This saves money and resources and protects the environment and climate.

In Leipzig, the advantage of car sharing was discovered early on. For example, two offices of the city administration decommissioned four vehicles. In exchange, a car sharing station with



five vehicles was installed directly on site. The pilot was so successful that more vehicles were taken out of service and car sharing stations were set up.

Car sharing also reduces process costs and relieves the fleet manager. The employees borrow the vehicles themselves and the car sharing provider takes care of the vehicle supply. This less often requires a tendering process for the procurement of new vehicles.

The next step to make car sharing even better for the climate and the environment is to gradually switch from vehicles with combustion engines to electric vehicles. Car-Sharing in urban areas is ideal for this, as the distances are usually short. However, in order to implement this change, investments in charging infrastructure are required.

CliMobCity reference

In the course of the 2050CliMobCity project, numerous ideas and solutions were exchanged on how to achieve a sustainable change in mobility. Leipzig was thus able to strengthen its view that e-mobility is a significant solution. During the first phase of the project, useful information was presented to project partners about the linking of different measures to achieve sustainable urban mobility during the Interregional Learning Seminars. This gave the team in Leipzig the idea to link different measures and now aims to strengthen the link between e-mobility and the car sharing model.

Action

Electrification is to take place in the area of car-sharing vehicles. Private parking spaces, which are rented through the car sharing provider, usually have a short contract period. Special use areas in the urban sphere of influence are also not owned by the provider. There is a high economic risk for operators of public charging infrastructure and car sharing operators, while the establishment of charging infrastructure as a prerequisite for electric vehicles requires long-term security. The city should therefore provide parking spaces with charging infrastructure (special use).

It is foreseen to implement those charging points for carsharing in cooperation with the local Public Transport Provider LVB which operates so-called mobility stations, which are interconnection points for various sustainable means of transport, such as car sharing, public transport stops, e-scooter stations and rental bicycles. The charging infrastructure for the car-sharing provider TeilAuto will be created in direct connection with the mobility stations. This will promote the electrification of the car sharing fleet and create a clear link with other sustainable transport modes, especially with regard to improving first/last mile transport connections. This minimizes the risk for the fleet operators, as the operator of the charging station is the municipal transport authority and this allows for long-term planning.

The action is to implement a pilot which can serve as model for similar projects in the urban area. The pilot has been influenced by the learning in 2050ClimobCity and will support the updated 'Measures and Implementation Concept "Leipzig - City for Intelligent Mobility"'.



Responsible actor

- **Government Department**, City Road Authority Leipzig;

Participants

- **Government Department**, City Road Authority Leipzig;
- **Car sharing Provider**, TeilAuto GmbH;
- **Power Provider**, Stadtwerke Leipzig GmbH;
- **Public Transport Provider** Leipziger Verkehrsbetriebe.

Timeline and costs

Time	Milestone	Expected costs	external
Q3/2022	Kick-off meeting with project partners	No costs	
Q4/2022	Finishing of the planning process for 5 charging points	No costs	
Q1/2023	Provision of the parking space	No costs	
Q4/2023	Finished charging Infrastructure	~10.000 EUR	
Sum		~10.000 EUR	

Financing

There will be no costs beyond regular staff costs associated with this action, as it is mostly awareness raising of the involved actors. All costs will be covered by the companies e.g., TeilAuto GmbH and LVB through regional and national funding. Only the parking spot will be provided by the city through regional and national funding. For example, the subsidy of 900 euros per charging point from the public bank Kreditanstalt für Wiederaufbau is worth mentioning here.