



## 2. Goal: climate neutrality by 2030

### Goal

#### LEIPZIG CLIMATE NEUTRALITY TARGET

In accordance with the Council resolution on the **climate emergency in 2019**, the City of Leipzig is pursuing the goals of the Paris Climate Agreement at municipal level and applies the internationally applied CO<sub>2</sub> budget approach as a basic principle. The calculation of Leipzig's remaining CO<sub>2</sub> budget is therefore based on a target scenario of a possible **limitation of global warming to 1.75 degrees with a probability of 83%**.

The residual budget still available is determined using the methodology proposed in the 2020 Environmental Report of the German Advisory Council on the Environment (SRU), resulting in a final **residual budget of 29.0 million tonnes of CO<sub>2</sub> equivalents** for the city of Leipzig **from 2020**.

The **EU Mission "100 Climate-Neutral and Smart Cities by 2030"** has given the City of Leipzig the opportunity to launch a city-wide climate protection program, aimed at purposefully pursuing the path to climate neutrality in a broad alliance of stakeholders. In addition to the already ongoing implementation of the Energy and Climate Protection Program (EKSP), external stakeholders from business, academia, and civil society are being involved in this process through a participatory approach.

By participating in the EU Mission, the **Leipzig City Council and city administration** have jointly committed to significantly reducing greenhouse gas emissions by 2030 (City Council Resolution VII-DS-06102). A significant intermediate goal is an 80% reduction in greenhouse gas emissions by 2030 compared to the baseline year of 2019 (5.25 tons of CO<sub>2</sub> equivalents per capita), assuming the optimal implementation of all measures.

In the **first phase** of the Climate City Contract, stakeholders from business and academia will be involved in the collective path towards climate neutrality. However, given the current conditions and the current level of external stakeholder integration, the ambitious goal of an 80% reduction is unlikely to be fully achieved for the time being, under the current conditions (first version of the CCC), we can realistically expect a **65% reduction in greenhouse gas emissions by 2030**.

The first phase of the Climate City Contract lays the foundation for a city-wide climate protection program. Processes and structures will be refined, and a more comprehensive monitoring system will be established.

In further **expansion stages of the CCC**, additional stakeholders will be integrated into the city-wide climate protection program over the next few years. Additional to this, further external support is needed to break down various existing barriers, accelerate the implementation of climate-protection measures, and bring the city closer to achieving climate neutrality under realistic assumptions.

With the help of the **Climate City Contract**, supported by political decisions at the state and federal levels, and with the promised measures (financial, regulatory, personnel) to reduce existing barriers, the achievement of the climate neutrality goal set by the City Council by **2040** is expected to accelerate. Based on the 2019 baseline, the goal is to close the **emission gap from 1.9 tons per capita to 1.1 tons per capita by 2030**, achieving a significant reduction of 80%.

#### STRATEGIC MILESTONES

The guideline of a precautionary energy and climate protection strategy has already been incorporated into the interdisciplinary urban development strategy for Leipzig, the **Integrated Urban Development Concept 2030 (INSEK)**. The INSEK 2030 was adopted by the City Council in 2018.

With the **Leipzig Strategy 2035** (further development of the INSEK 2030), the strategic objectives and projects of the City of Leipzig were harmonised with the vision "Leipzig grows sustainably and serves the

common good". The climate neutrality target was also included, as were the goals of our sustainable mobility strategy.

Figure 2 Target image Leipzig Strategy 2035



When the climate emergency was declared in October 2019, an **immediate action programme** was set up in **2020** with 24 measures to be implemented directly. This programme includes **investments of 20 million Euro** for:

- the expansion of renewable energies on municipal roofs and open spaces,
- raising building and renovation standards,
- strengthening climate-conscious mobility services,
- setting up an office for sustainable nutrition and agriculture and
- climate accounting for cultural institutions and events.

The many years of climate protection work to date were recognised in 2021 with the **European Energy Award in Gold**.

However, it was only with the council resolution on the **Energy and Climate Protection Programme 2030 in October 2022** that we succeeded in translating the energy and climate policy necessities into a municipal programme in such a way that **150 measures** are being implemented **under the collective responsibility of over 20 departments and municipal companies**. The measures of the EKSP are being concretely implemented through **two-year action plans**, supported by **financial backing** to enhance **monitoring**.

In the central **municipal leverage sectors of the transport, energy and heating transition**, we are working closely with municipal companies to provide services of general interest and pursue the development goal of a sustainable, resilient and intelligent supply and disposal structure. In 2023 and 2024 alone, together with the Leipziger Group as a municipal entity, we were able to invest **EUR 305 million per year** in the transport and renovation transition, thereby saving up to **1.1 million tonnes of CO<sub>2</sub>**.

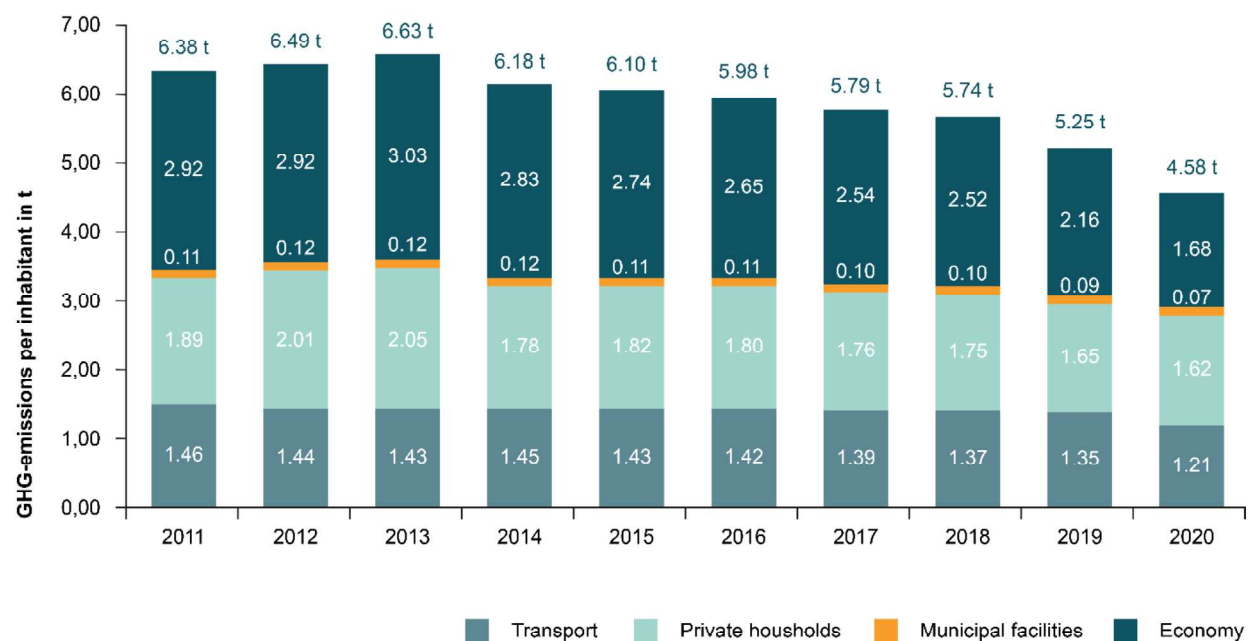
At the same time, we are positioning ourselves as a **local authority** to become **climate-neutral by 2035**. As the second largest employer in the Free State of Saxony, our starting balance sheet impressively demonstrates that by 2021, we were already well on our way to reducing our total emissions of approximately 47,399 tonnes of CO<sub>2</sub> equivalent to a minimum. At the same time, the process of

drawing up **municipal heating plans** is underway to make Leipzig's heating supply future-proof, climate-neutral and affordable by 2038.

## THG - BALANCE SHEET

In order to review the impact of the measures taken to achieve the target, the current status on the path to climate neutrality is regularly assessed using the standardised nationwide greenhouse gas balancing method in accordance with the BSKO standard. The **BSKO standard (municipal accounting system)** is based on the final energy-based territorial principle. It includes a list of final energy consumption that occurs within the municipal area, an analysis of the life cycle of all energy sources (including extraction, conversion, transport and use) and a derived greenhouse gas balance. Some data, in particular the consumption of electricity, district heating and gas, is only transmitted by the energy supply companies and network operators two years after the fact for auditing reasons. This means that the publication of a comprehensive greenhouse gas balance is always delayed. All energy-related consumption in the private household, commercial and transport sectors in the Leipzig city area is recorded. Energy consumed outside the city (e.g. for consumer goods) and air travel cannot be recorded. In addition to carbon dioxide (CO<sub>2</sub>), the most emitted greenhouse gas, the two other most important greenhouse gases methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O) are also analysed. For reasons of stringency, the emission factor of the overall German electricity mix is used in the BSKO standard. This means that Leipzig's successes in renewable electricity generation plants do not have a direct impact on the balance, but only indirectly via the change in the overall German electricity mix.

**Figure 3 Development of GHG emissions per inhabitant in the city of Leipzig**



The per capita greenhouse gas emissions of the city of Leipzig in 2011 and 2021 initially increase and then slowly but steadily decrease, followed by a more significant reduction in 2019 and 2020. The population grew by 18.0 % during the period under review.

The reduction in greenhouse gas emissions in 2019 is mainly due to lower natural gas consumption in the commercial sector and improved electricity emissions. This is because more electricity was produced using renewable energy sources both locally and throughout Germany. In 2020, total emissions fell sharply, particularly in the transport and economic sectors. The measures to contain the COVID-19 pandemic led to a sharp reduction in traffic volumes and production losses in the economy as a result of delivery difficulties. Climate change also had an impact: Nine of the ten years analysed were significantly too warm, which reduced the need for heating energy. Greenhouse gas emissions fell by 22.1 % over the total period of 11 years (2011 - 2021, with weather correction) (without: 21.3 %). In the business



sector (including all municipal facilities, which account for around 2% of the City of Leipzig's total emissions), emissions fell more sharply (33.7%) than in the household (4.8%) and transport (17.1%) sectors. In 2021, GHG emissions will be 5.02 tonnes per inhabitant.

## ENERGY FLOW ANALYSIS

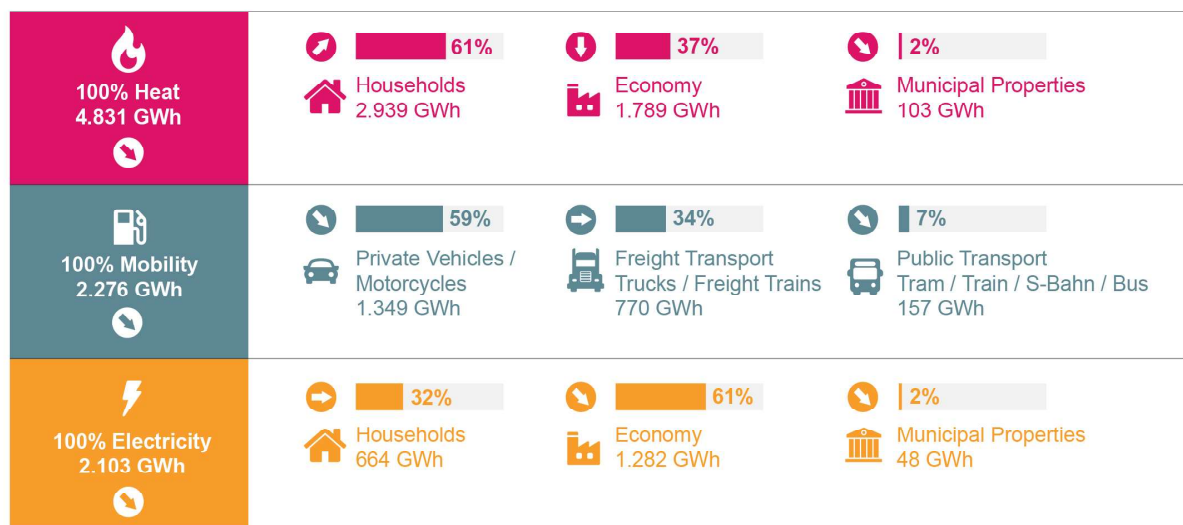
Leipzig's 2020 energy flow analysis shows that total energy consumption in the city of Leipzig has fallen by 10% compared to 2018 (10,187 GWh). Private households were the only sector to record a slight increase in final energy consumption in 2020, which is due to the effects of the coronavirus pandemic.

Figure 4 Energy flow analysis 2020 City of Leipzig - Part I

Energy Flow Analysis  
2020

Total CO<sub>2</sub> Emissions  
2.734.942 t

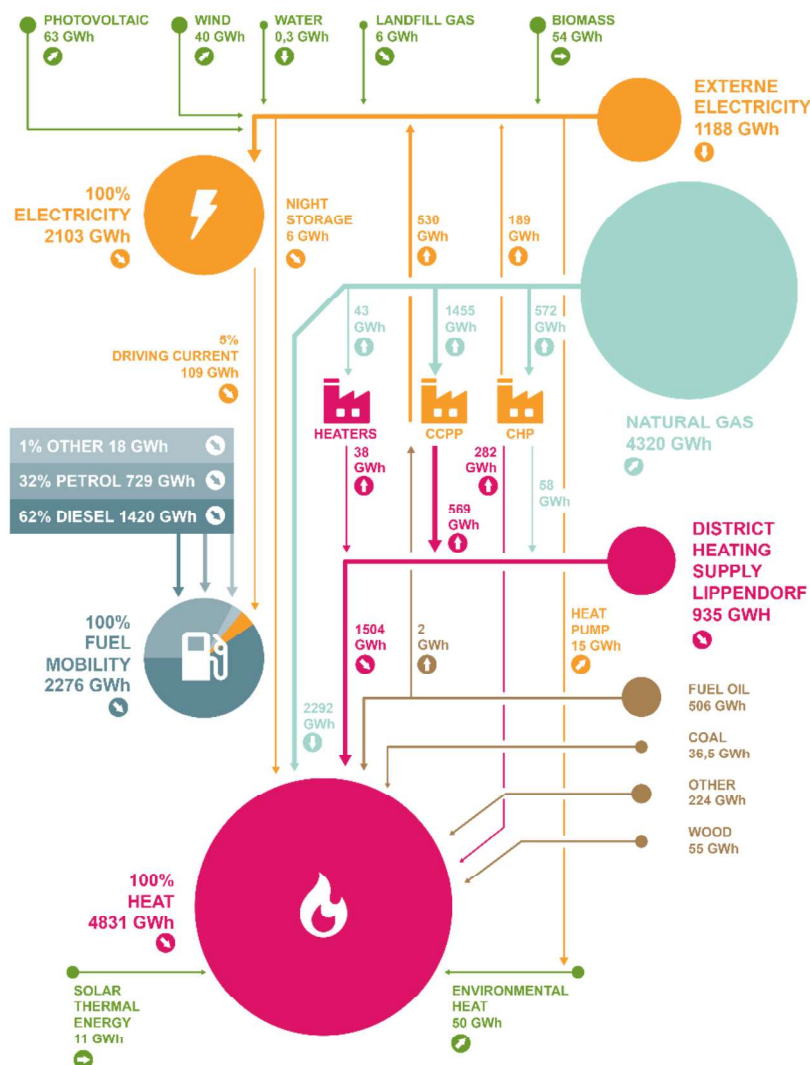
Total Energy Consumption in Leipzig  
9.104 GWh



In addition to the balancing by sector, the breakdown by energy source provides important information for the strategic direction of energy and climate protection work in the city. The main energy sources and energy source groups are therefore presented below in terms of their share of final energy consumption. The total production of electricity from renewable energies was increased and the share of renewable energies in total electricity consumption for the city of Leipzig is 8% in 2020.

Figure 5 Energy flow analysis 2020 City of Leipzig - Part II

## LEIPZIG CITY AREA



Leipzig is pursuing a holistic strategy that combines the reduction of climate-impacting emissions with the goals of integrated urban development. By utilising locally renewable energy sources and improving energy efficiency, the city not only contributes to global climate neutrality, but also strengthens its regional resilience and economic stability. A central component of this strategy is reducing dependence on fossil fuel imports. In a geopolitically dynamic global situation with increasing risks, this not only means greater energy independence, but also a strengthening of regional economic cycles. Revenues remain in the region, circulate locally and thus contribute to economic prosperity instead of being channelled into international trade in fossil fuels.

Leipzig's sustainable energy supply also brings social and environmental benefits. Making transport more environmentally friendly and increasing the use of low-emission vehicles improves air quality, especially in congested urban centres. This leads to a higher quality of life for residents. In addition, targeted climate protection measures contribute to the preservation and promotion of local biodiversity, which not only serves the ecological balance, but also has a positive impact on the urban climate and general well-being. The intelligent linking of centralised and decentralised energy approaches, such as virtual power plants, is of strategic importance. These smart solutions benefit from the many years of cooperation between Leipzig City Council, Stadtwerke Leipzig and partners from science and industry, e.g. as part of EU projects such as Triangulum and SPARCS. These diverse measures and targeted





cooperation not only make Leipzig a pioneer in the energy transition, but also increase the city's attractiveness for sustainable investments. The creation of long-term jobs in innovative industries of the future will further strengthen the city's economy and ensure its sustainable future viability.

Another positive effect is the improvement in air quality due to the reduction in emissions of pollutants such as nitrogen oxides and particulate matter. Good air quality is an important factor for people's quality of life, especially in urban centres with high levels of traffic congestion. Air quality can be significantly improved by making transport more environmentally friendly and using low-emission vehicles and energy sources.

Targeted climate protection measures can also contribute to the preservation and promotion of local biodiversity. Climate change and the scarcity of natural resources pose major challenges for biodiversity. The city of Leipzig is taking targeted measures to preserve or even improve habitats for animals and plants. This not only serves the ecological balance, but also has a positive effect on the urban climate and the well-being of residents.

### 3. Strategic priorities

#### 3 Strategic priorities

##### MUNICIPAL LEVERAGE SECTORS

Leipzig, one of Germany's most dynamic cities, wants to play a pioneering role in achieving climate neutrality targets and share its experiences and solutions with other cities. In order to realise these ambitions, the City Council has set the **three municipal leverage sectors** as systemic-strategic priorities that are decisive for the implementation of the Climate City Contract (CCC) by adopting the Energy and Climate Protection Programme 2030.

The main sectors on the way to a climate-neutral city are **transport, electricity and heating**. In the coming years, Leipzig will: focus on reducing CO<sub>2</sub> emissions through,

- increasing the share of renewable energies in the electricity and heating sector,
- the reduction of energy requirements,
- focus on the promotion of sustainable mobility options
- the implementation of technologies and digital applications which help to accelerate the transition process and to operate a climate neutral city.

To this end, we are endeavouring to comprehensively replace fossil fuels with renewable energies in the areas of **electricity, heating and transport**.

The future development of energy consumption and greenhouse gas emissions in the transport sector is heavily dependent on optimised interaction between the various political decision-making levels. Changing existing instruments and creating new incentives for eco-mobility at federal level can reduce the attractiveness of motorised private transport. The resulting increase in the volume of traffic should be redirected to eco-mobility. Accelerating the **transport transition** is therefore at the centre of our strategic priorities. The basis for this is the **sustainability scenario of the Mobility Strategy 2030** with an associated framework plan. The scenario is also aligned with the climate targets of the City of Leipzig. This includes the increased promotion of local public transport and cycling. Transport-related emissions in urban areas will be reduced in the long term through attractive, affordable and inclusive mobility options for Leipzig's population.

**Table 1 Development of modal split**

Modal split City of Leipzig	2018	Sustainability scenario 2030
PUBLIC TRANSPORT	17,5 %	23,0 %
Foot	27,3 %	24,0 %
Wheel	18,7 %	23,0 %

In quantitative terms, this means achieving a 70 per cent share of eco-mobility, with local public transport accounting for 23 per cent, cycling for 23 per cent and walking for 24 per cent. At the same time, the share of motorised private transport in the modal split is to be reduced to 30 percent. The aim is to increase passenger numbers to 220 million passengers per year and to increase the utilisation of local public transport by expanding the range of services.

The further expansion of **renewable energy** plants in Leipzig is being prepared by the so-called "Framework concept for the planning control of land requirements for the production of renewable energies (Rako-FEE)". The expansion of renewable energies for electricity generation is already being supported by a **solar cadastre** on possible RE potential on roof surfaces, a **funding programme** for the installation of balcony solar modules and a **solar scout** who explicitly advises businesses with large roof surfaces on the expansion of PV systems. In addition, the city administration and its municipal companies, e.g. Leipziger Wohnungs- und Baugesellschaft (LWB), have committed to the further expansion of PV systems on their buildings. By the end of 2023, the LWB had installed 97 photovoltaic systems with a total output of 4.07 MWp. This corresponds to the electricity consumption of around 2,000 two-room flats. PV systems with a total output of 1 MWp will be added in 2024 alone. The systems will be installed and operated by the wholly owned subsidiary WSL Wohnen & Service Leipzig GmbH. Since 2023, the LWB has also been supporting the construction of PV balcony power plants by tenants.

Due to the urban area with limited land potential for renewable energy plants, cooperation with the surrounding municipalities of Leipzig is essential. Here too, planning and coordination processes are already underway with the Leipzig-Western Saxony Planning Association.

The future development of the **heating mix**, i.e. the distribution of final energy consumption across the various energy sources, depends on various factors. Fossil fuels such as heating oil and coal must be almost completely replaced by 2030. In the area of private households and municipal properties, the aim is to replace all systems with climate-friendly heating technology by then. Overall, the proportion of fossil fuels must fall to around 30 % and heating oil, liquid gas and coal must be completely replaced by renewable energies, district heating (using fossil and renewable energy sources) or natural gas.

Switching to a **climate-neutral energy and heat supply** is therefore a major lever for efficiently reducing greenhouse gas emissions in Leipzig. To achieve this, we need to scrutinise existing structures, use digital technologies and social innovations.

Leipzig City Council is playing a central role in shaping the transformation process of the heating supply and is developing a **municipal heating plan** for this purpose. The administration of the City of Leipzig, Leipziger Stadtwerke, Netz Leipzig and Leipziger Wohnungs- und Baugesellschaft are working together on this. The municipal heating plan aims to take the necessary steps for a sustainable, renewable heat supply in line with the city's climate and energy strategy. The prerequisite for successful implementation of the heating plan is an efficient technical infrastructure.

## 10 FACTORS OF SUCCESS FOR CLIMATE PROTECTION

In order to significantly reduce CO<sub>2</sub> in the municipal leverage sectors and at the same time shape the transformation to a sustainable city with the commitment of the urban society to climate protection, we have identified the following **ten success factors (key areas)** in our energy and climate protection programme. They will guide our future energy and climate protection work until 2030 and integrate further impetus for the implementation of measures together with the urban society. This addresses

key levers of municipal climate protection work and defines strategic milestones for the process towards climate neutrality.

**Figure 6 EKSP factors of success**



**Sustainable and climate-sensitive urban development** not only includes the creation of environmentally and climate-friendly living spaces, but also a holistic ecological approach to urban development. Innovative concepts such as neighborhood energy concepts and energy-efficient refurbishment management are being actively promoted. At the same time, projects to increase energy efficiency are being driven forward, such as the refurbishment of municipal building complexes and the introduction of energy-efficient heating and lighting systems. This is accompanied by ongoing user training programmes in municipal administrative, educational and leisure facilities. In addition, Leipzig consistently focuses on the circular economy to minimise the amount of waste and recycle materials as completely as possible. The city's "Zero Waste Strategy", which pools initiatives and stakeholders in waste avoidance and recycling and strengthens them together with Leipzig's municipal waste management organisation, is key to this.

Leipzig is aiming for a **climate-neutral city administration** by 2035. The implementation concept addresses internal processes ranging from employee mobility and climate-neutral administrative buildings to procurement processes. One focus, for example, is the installation of solar systems on **municipal buildings** and roofs. This should help to increase the proportion of clean energy generation in Leipzig and reduce dependence on fossil fuels.

Leipzig is investing heavily in basic research and planning services for heat planning and the **heat transition**. This includes the **development of strategies and measures** for efficient heat utilisation as well as the expansion of heating networks and renewable heat sources. Leipzig is planning and realising the expansion of solar thermal plants (including Germany's largest solar thermal plant in Leipzig-Lausen) in order to generate renewable energy from sunlight and strengthen the local energy





supply. Another focus is the planning of a waste heat pipeline from the Leuna industrial site, which will feed industrial waste heat into the city's district heating network.

In the area of **mobility**, the city also relies on a multidimensional mix of measures, e.g. by implementing the superblock approach. This aims to reduce **traffic** and improve the quality of life in certain neighbourhoods. This is achieved by setting up car-free zones, promoting pedestrian zones and improving local public transport. Another priority is the expansion of cycle paths to promote cycling and to increase the proportion of environmentally friendly modes of transport. This includes the creation of safe cycle paths, bicycle parking facilities and the promotion of bicycle hire systems. Special attention is being paid to the north of Leipzig, where urban development measures are planned that address sustainability and climate protection. These include the creation of green spaces, the promotion of renewable energies and the development of sustainable transport concepts.

The city of Leipzig promotes the **sustainable supply of** regional and seasonal food to the city's population. As part of the Biostädte network, Leipzig promotes the expansion of organic options in communal catering, particularly in school and day-care centre catering. With the local food strategy, we are pursuing the further development of urban-rural partnerships to promote the ecological cultivation of land and to increase regional added value.

In order to be able to clearly localise measures in the EU system, the success factors explained were assigned to the EU system as follows.

**Table 2 Merging fields of action & EKSP**

Merging fields of action & EKSP	
EU Fields of action	success factors (= key areas) of the EKSP
Energy systems	Sustainable energy and heat supply (KSA 2)
Mobility & transport	Sustainable mobility (KSA 1)
Waste & circular economy	Regional circular economy (KSA 7)
Green infrastructure & nature-based solutions	Climate-friendly green-blue infrastructure (KSA 4) Sustainable nutrition (KSA 8) Sustainable land-use (KSA 3)
Built environment	Climate-friendly urban district development (KSA 5)
Other/Engagement	Climate-neutral city administration (KSA 6) Climate education (KSA 9) Climate protection initiative - CCC (KSA 10)

## DIGITALISATION AS A TRANSFORMATION ENABLER

The European Green Deal recognises digital technologies as a key prerequisite for achieving the UN Sustainable Development Goals and aims to provide concrete support in line with the European Union's digital strategy with the EU's Digital Compass. Digital solutions and processes will provide support in all fields of action of the EKSP and contribute to more sustainable urban development (Green Smart City). Among other things, resource-saving - because digitalised and optimised - workflows, intelligently controlled mobility and integrated urban development that takes climate protection into account and can model climate impacts will help here. Climate protection measures, for example, can be planned in a more targeted manner, their real impact measured and linked with other influencing factors and data sources external to the city (e.g. weather, traffic) to form a climate protection monitoring system. Energy and resource consumption will be countered by energy-saving technologies and the collection and processing of only the necessary data. By participating in the EU project SPARCS for the development of energy-positive neighbourhoods (PEDs), the City of Leipzig is working with Leipzig's municipal utilities, municipal housing companies and SMEs in the real-world laboratory to test innovative, digital approaches to achieving climate neutrality and the energy transition. Solutions are being developed and tested here, particularly in the two sectors of heat and electricity, which also enable the realisation of virtual power plants in the city area, among other things. As part of the EKSP, the City of Leipzig is also focussing on the development of digital twins in