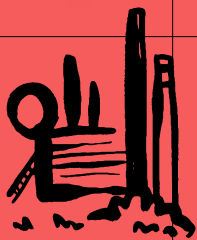


Climate Neutral Industrial City

Linz 2040



City-wide concept for net-zero
greenhouse gas emissions and
sustainable carbon management

Klima
stadt **L_nz**

03
09

Summary for decision-makers

Graphical abstract



01

Summary for decision-makers

At the latest, the City of Linz is pursuing the goal of becoming climate neutral by 2040. This goes hand-in-hand with a historic transformation to a climate neutral industrial city. To achieve the goal of climate neutrality, the city-wide greenhouse gas emissions must be reduced by at least 90 % (relative to the base year 2019) by 2040. A maximum of 10 % of the unavoidable residual emissions can be stored in natural carbon sinks (forests, wetlands) and through technical solutions (carbon capture and utilisation, circular economy) in the Linz urban area as well as offset in robust scientific projects for the compensation of greenhouse gas emissions outside of Linz.

The City of Linz, with its far-reaching and consistent climate policy until 2040 and beyond, contributes to the Paris Agreement's achievement and ensures future generations' well-being. The strong economic location of Linz will also profit from this. The entire steel production in Linz should thus be climate neutral by 2050 at the latest, in line with the target path of the EU Emissions Trading Scheme.

The past shows that Linz has already faced many challenges. Examples are the reconstruction after 1945 or the Clean Air Act in the 1980s. Crucial for the positive management of crises and social upheavals were political courage, innovative technologies, and social cohesion, three characteristics which will also be necessary for the climate neutral industrial city in 2040. Regarding climate policy, the City of Linz is subject to a federal or legal framework set by the European Union, the Republic of Austria, and the State of Upper Austria. Intensive cooperation with these local authorities or institutions is therefore essential.

The City of Linz is currently pursuing several climate change mitigation goals that have already been adopted in 2019. Although these were formulated with varying degrees of ambition depending on the areas of activity or the climate-related sector, some are only partially quantifiable and can, therefore, only be verified to a limited extent. In the energy activity area, clear milestones are defined for the defossilisation of electricity and heat supply. In the transport field, there are clear objectives regarding soft forms of mobility. However, efforts to reduce the share of car routes in the Linz region should be accelerated due to the results of the 2022 Mobility Survey in the State of Upper Austria. The target year for converting the municipal vehicle fleet to e-vehicles remains unclear. There are qualitative target values in the activity area buildings concerning recyclable or circular building construction, which should be backed up with verifiable target values as soon as possible. The *1st Linz Climate Strategy 2019* also defined preserving biodiversity in land and water habitats as a fundamental goal.

The city-wide climate neutrality concept provides technical bases and contains a comprehensive catalogue of measures with climate change mitigation measures for altogether seven activity areas. Because the City of Linz cannot implement equally effective climate change mitigation measures in all seven activity areas due to unequal legal and operative competencies but bears overall responsibility for climate neutrality and acts as a role model, three areas of influence of the urban climate policy were defined. The activity areas of governance, energy, buildings, and transport / mobility are part of the City of Linz's direct and expanded sphere of influence. This means that the Linz City Administration can immediately implement effective climate change mitigation measures in coordination with the Corporate Group of the City of Linz. The activity areas of industry and business, as well as consumption, are counted as part of the indirect sphere of influence because climate change mitigation measures by the Linz City Administration and the Corporate Group of the City of Linz only have limited or no influence over these and only a lower target accuracy can be achieved.

The city-wide climate neutrality concept was developed in a broad-based development process with

multiple stakeholders from politics, administration, industry and economy, science, and civil society. Methodologically, it follows the *Greenhouse Gas Protocol for Cities – An Accounting and Reporting Standard for Cities*, the *International Workshop Agreement IWA 42: Net Zero Guidelines Accelerating the Transition to Net Zero* of the International Organisation for Standardisation (ISO) and the *Sixth Assessment Report (AR6)* of the Intergovernmental Panel on Climate Change (IPCC). The Wegener Center for Climate and Global Change of the University of Graz, the alps GmbH Innsbruck, and the Climate Advisory Board City of Linz scientifically monitored and assessed the climate neutrality concept.

Citizen participation for the climate neutrality concept was implemented with the project UniNETZ of the Alliance of Sustainable Universities in Austria. In the run-up to this, a climate-related survey was undertaken with a representative sample size of 13,000 persons for the resident population of Linz. The rate of participation was 12.8 %. The survey results showed that climate change mitigation is a big concern for the people of Linz, and approximately 82 % of respondents stated that Linz should comply with an upper limit for its own greenhouse gas emissions. Additionally, all climate change mitigation measures should always be carried out socially justly. Interested citizens were invited to a citizen panel and an additional event to allow them to contribute to the content of the climate change mitigation measures.

The city-wide greenhouse gas emissions were determined in two significant main sub-inventories: according to a production-based observation (e.g. industrial processes, heat provision, urban traffic, etc.) and a consumption-based observation (e.g. end-user demand according to consumer goods in private households, business investments, etc.). Production-based GHG emissions of the City of Linz amounted to approx. 10.9 megatons (Mt) CO₂eq. in the chosen base year 2019. Excluding industrial emissions, around 1.4 Mt CO₂eq is attributable to the energy, buildings, and transport / mobility sectors. Based on consumption, approx. 2.7 Mt CO₂eq were emitted in Linz in 2019 and originated mostly from general consumption. The remaining greenhouse gas budget still available for Linz until 2040 is 90 Mt CO₂eq (production-based) and 14 Mt CO₂eq (consumption-based). This GHG budget is in line with the Paris Agreement and should be reviewed regularly by city-wide greenhouse gas monitoring.

Overall, 52 climate change mitigation measures were defined for seven activity areas. Although using green technologies (hydrogen) in Linz’s industry represents the biggest climate change mitigation lever regarding the city-wide GHG inventory, a fast implementation of far-reaching climate change mitigation measures is needed in the non-industrial activity areas to become climate neutral by 2040. Examples are the integration of industrial waste heat into the energy system, thermal-energetic refurbishments, circular building, expansion of the bicycle infrastructure, improving natural carbon sinks, etc. Here is an overview of the defined climate change mitigation measures:

Activity area: governance	
→ Regular city-wide greenhouse gas monitoring and reporting to the Linz City Government	→ Exploitation of existing biomass potential
→ Aligning the municipal budget with climate work	→ Climate change mitigation-orientated spatial energy planning
→ Climate neutral Linz City Administration	→ Investigation of carbon capture and utilisation (CCU) technologies for power stations
→ Establishment of a twin town partnership for climate neutrality	→ Storage of electricity and heat from renewable energies to compensate for seasonal and short-term fluctuations
	→ Promotion of energy consultation for private individuals, companies and associations
Activity area: energy	
→ Defossilisation of district heating / cooling supply	Activity area: buildings
→ Expansion of district heating / cooling supply	
→ Dismantling the fossil gas infrastructure where possible	
→ Integration of industrial waste heat into the energy system	
→ Linking the district heating plant of LINZ AG to the hydrogen infrastructure (example: Project <i>EUH2STARS</i>)	
→ Expansion of roof-mounted photovoltaic systems	
→ Construction of photovoltaic systems on sealed surfaces and open spaces	
→ Creation of renewable energy communities (REC)	
→ Increase in subsidies for photovoltaic storage solutions	
→ Promotion of solar thermal energy	
→ Investigation of geothermal potential in the greater Linz area	

Activity area: transport / mobility	
→ Expansion, densification and acceleration of public transport	
→ Expansion of the charging infrastructure for electric vehicles available to the public	
→ Increased public funding for the charging infrastructure for electric vehicles	
→ Expansion and improvement of the inner-city bicycle path infrastructure	
→ Improvement of the pedestrian infrastructure and promotion of pedestrian traffic	
→ Changes of the modal split in favour of soft mobility through regulations and incentives (push & pull)	
→ Parking space management	
→ Expansion and new construction of infrastructure for Bike & Ride and Park & Ride at public transport hubs	
→ Expansion of restricted traffic zones	
→ Expansion of bicycle highway networks to Linz and surroundings	
→ Expansion of e-car sharing services	
→ Expansion of the shore-side power supply for Danube shipping	
→ Electrification of the municipal vehicle fleet, including the implementation of operational mobility management with a clear focus on climate change mitigation	
→ Establishment of pedestrian and shared zones in all parts of the city	

Activity area: industry und economy	
→ Development of a green hydrogen economy in Linz	
→ Creation of an infrastructure for the import of green hydrogen	
→ Acceleration and simplification of the official authorisation procedure for climate-friendly key technologies	
→ Investigation of potential on all levels of the circular economy (secondary raw materials, recyclable products and carbon capture and utilisation) and development of a circular economy in Linz	
→ Climate change mitigation pact between the City of Linz and Linz companies	
Activity area: consumption	
→ Promotion of vegetarian and vegan, as well as regional and seasonal diets incl. awareness raising	
→ Consumption-free zones in the city centre (indoor and outdoor areas)	
→ Expansion of lending services modelled on the Dinglei(h) system	
→ Awareness raising and offers for climate-friendly consumption by the City of Linz	

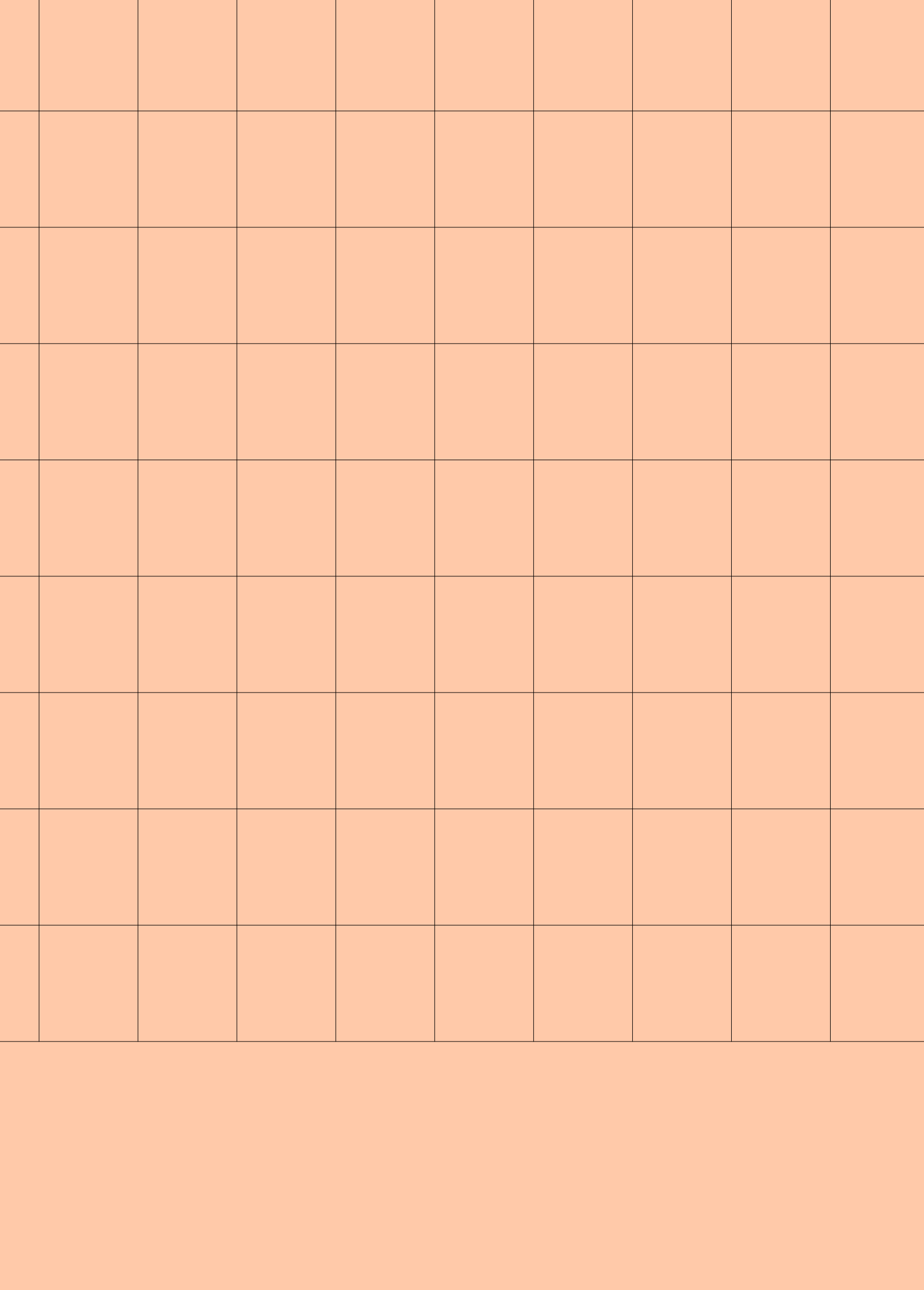
Other activity areas	
→ Defossilisation of the waste management through climate-friendly technologies	
→ Investigation and strengthening of natural greenhouse gas, respectively carbon sinks in the Linz urban area (forests, wetlands)	

As a structural measure, aligning the preparation of the financial budget to climate neutrality is particularly important. Considering climate-friendly aspects when drafting the budget must be done in line with the principles and provisions of financial management (economy, efficiency and expediency) and should promote sustainable development. With an available climate neutral public infrastructure (traffic system, district heating, loan offers), citizens can affordably meet their basic daily needs with less consumption and lower GHG emissions.

03	Foreword
06	Glossary
08	Starting point
12	Climate policy in the City of Linz: Climate change mitigation as a guiding principle
16	List of references



02



Foreword



© Robert Maybach

Dear people of Linz,

Our city has set itself the goal of being climate neutral by 2040 at the latest. We are, therefore, called upon to take up the challenge of phasing out fossil fuels with all our might. The project of our city becoming a climate neutral industrial city is this century’s challenge, but there is also no alternative. It is clear to me that such a transformation can only be achieved together. This ambitious goal requires the cooperation of the entire community of Linz. On our way to climate neutrality, we, as the City of Linz, developed a participatory format wherein experts, the municipality, the Corporate Group of the City of Linz (Unternehmensgruppe der Stadt Linz – UGL) and above all, the population of Linz are involved. As a result, the Abteilung Wirtschaft, Innovation, Klimaschutz und EU and Stadtforschung created a survey inviting citizens to participate actively. Approximately 60 inhabitants from Linz took part in two subsequent workshops.

Under the scientific guidance of the Wegener Centre of the University of Graz, approximately 50 key employees from relevant business divisions of the Linz City Administration and the UGL discussed corresponding measures on which there will be increasing focus in the coming years. By signing the cooperation agreement for the *Linz mit Ambition3xn* project with the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology, Linz is again highlighting its ambitious goal of becoming climate neutral.

Klaus Luger

Mayor



© Werner Harrer

At the latest, the City of Linz has set itself the goal of being climate neutral by 2040. This concept document shows us the way to achieve this goal jointly. Together with the climate change adaptation concept *Zukunft Linz (future of Linz)*, it now forms the basis for future climate action.

We are called upon to put all our efforts into taking up the challenge of phasing out fossil fuels. Our focus, however, is not only on reducing CO₂ emissions but also on social interaction. Our goal is to shape Linz so that climate change mitigation and social justice go hand in hand. I would like to thank all those who contributed to the creation of the concept and, particularly, the employees responsible for the project.

Everyone’s involvement is crucial when it comes to implementation. The city, companies, organisations, and citizens must now work together to create a climate-friendly Linz for future generations.

Mag.^a
Eva Schobesberger

City Councillor for Climate Affairs



© Stadt Linz

I am delighted to present to you our city's climate neutrality concept – a milestone for our sustainable future. It is more than a document. It is a living vision for a climate neutral Linz. The Linz City Administration does not only want to meet the challenges of climate change but actively shape the future of our city. Therefore, this concept is based on cooperation across organisations, transparency and comprehensive citizen participation. The coming implementation phase also requires our joint effort. The municipality, companies of the UGL, economy, civil society – each and every one of us is needed.

This concept is a promise to future generations. It shows our determination to set the course for a future worth living. Let us start this journey together with heart and mind for a climate neutral City of Linz in which we are proudly part of a sustainable community.

I thank you for your support and your faith in our climate neutral future!

**Mag.^a
Ulrike Huemer**

Director Linz City Administration /
project principal



© Robert Maybach

At the latest, the City of Linz has set itself the goal of being climate neutral by 2040. As an industrial city, Linz is confronted with several challenges. At the same time, the city is binding many forces that are driving the green transformation forward together through creative solutions. Linz AG can count itself as one of these forces.

Our teams work intensively 365 days a year on many future topics, with significant headlines ranging from the energy and mobility transition to the circular economy and drinking water protection. Sustainability and the security of supply are the main guiding principles behind all our actions.

The district heating campaign should be mentioned here as representative of many actions. With consistent expansion and progressive decarbonisation in heat generation, Linz AG makes an essential contribution to a future worth living in terms of sustainability. District heating, like hydrogen (another main focus of ours), is seen as a key technology in the energy transition.

I wish the City of Linz and all those accompanying it many successful stages on the way to climate neutrality, which is documented and strengthened in this report.

**DI Erich Haider
MBA**

Generaldirektor der LINZ AG
für Energie, Telekommunikation,
Verkehr und Kommunale Dienste



© Weatherpark GmbH

Anthropogenic climate change is the biggest challenge of our time. By emitting greenhouse gases such as CO₂ and methane, we have changed the climate radically and now see the effect as a climate crisis.

This was demonstrated to us clearly in the past year, 2023, which was characterised by multiple extreme weather events. In Austria and globally, these were floods due to heavy rains, drought, and low groundwater levels. In addition, there are forest fires, heat waves, and record temperatures. The climatological measurements also paint an apparent picture. The meteorological autumn was the warmest in the 257-year measuring history of Austria. Globally, 2023 was the warmest year.

We now need radical measures to overcome this challenge. The climate neutrality concept of the City of Linz, with the ambitious goal of climate neutrality by 2040, points to the way in which a successful transformation can be achieved. Moreover, we must achieve this quickly.

**Mag.
Simon Tschannett**

Expert in urban climate and meteorology
Chairman of the Climate Advisory Board
City of Linz



© Stadt Linz, Dworschak

The vision of the climate neutral industrial City of Linz by 2040 at the latest is crucial for the well-being of the people of Linz, now and in the future. However, the transformation there, which has no alternative, should not be considered a sprint. Instead, it is an exciting marathon for which trustworthy and strong alliances between politics, administration, companies, science, and civil society are prerequisites.

My task as climate coordinator is to provide the Linz City Administration with the best possible basis for decision-making. This is done by providing knowledge and know-how. Climate policy is only successful if it is evidence-based, which requires an innovative and effective administration as a partner.

The climate neutrality concept looks at the entire city but focusses on climate change mitigation measures that the Linz City Administration and the Corporate Group of the City of Linz can effectively implement. It is, however, intended to speak to all interested stakeholders in the City of Linz. My team and I clearly see the city-wide climate neutrality concept as a living document that will be expanded in terms of content and implementation, which will be monitored regularly in the coming years.

**Oliver Schrot
PhD MSc**

Climate Coordinator City of Linz
Head of the Department Wirtschaft,
Innovation, Klimaschutz und EU

Glossary

The glossary provides technical terms from climate research and administration in the most straightforward possible language and explains how they are used in the climate neutrality concept.

Defossilisation: the phasing out of fossil, carbon-containing raw materials and energy sources (crude oil, natural gas, coal, etc.) and the switch to renewable energy sources (solar power, wind and hydropower, biomass, geothermal energy) and the recycling of renewable carbon

Carbon capture and utilisation (CCU): Technologies to reduce CO₂ emissions by capturing carbon dioxide from industrial processes and utilising the technically captured carbon to manufacture usable products

Co-benefit: Additional benefits resulting from the implementation of climate change mitigation measures

City-wide: the concept pursues the most comprehensive approach possible to urban greenhouse gas emissions and climate change mitigation measures in Linz; it appeals to the responsibility of all stakeholders (companies, the Linz City Administration, private households, etc.) for ambitious climate change mitigation and applies to the entire City of Linz with special consideration of voestalpine AG’s planned climate neutrality by 2050 at the latest

Activity area: the economic and social area where the City of Linz can implement its climate change mitigation measures (power generation, transport / mobility, etc.)

Intergovernmental Panel on Climate Change (IPCC): “Weltklimarat” in German; the IPCC is a scientific organisation of the United Nations which summarises and evaluates the global state of knowledge regarding human-induced climate change

Sustainability: a widely used principle of action that means that the needs of the present must be satisfied in such a way that it does not limit the development possibilities of future generations; climate change mitigation measures are sustainable when these are economically efficient, socially just, and ecologically viable

Net zero greenhouse gas emissions: the state in climate change mitigation in which a city or organisation has been able to reduce its own greenhouse gas emissions by more than 90 % (relative to the selected base year), and the remaining greenhouse gas emissions are balanced in carbon sinks; is determined by a greenhouse gas inventory

Climate: the statistical description of meteorological variables (temperature, precipitation, wind, etc.) in an area (Linz, Austria, etc.) over a sufficiently long period (from centuries to geological time scales), but at least for 30 years

Climate mainstreaming: a systematic approach that takes climate targets and climate issues into account in all political, economic and social decisions in a city or organisations and pursues them ambitiously

Climate neutrality: the physical balance between human-induced greenhouse gas emissions into the atmosphere and the storage of greenhouse gases in sinks (known for CO₂ or carbon) so that there is no further increase in global warming. This means that other parameters of the climate system influenced by humans (reflectivity of the earth’s surface, which is changed by human land use, or climate-damaging biomass (livestock) in agriculture) must not impact the global climate. A city or organisation is only considered climate neutral if it has been able to reduce more than 90 % of its own greenhouse gas emissions and offset a maximum of 10 % of unavoidable residual emissions (this value corresponds to the limited global availability of sustainable carbon storage) in the long term through the development of greenhouse gas or carbon sinks

Climate system: the complex interaction of all climate elements in the earth’s atmosphere (air temperature, precipitation, humidity, cloud cover and wind, etc.) with all subsystems and parameters (humans, ocean, lakes, rivers, ice and snow, solid rock and soil, plants, and animals, etc.) as well as external influences (space, etc.)

Climate transformation: the general change in lifestyle and the economy towards climate neutrality and sustainability, which can be observed in modern society

Carbon management: the planned and economical use of carbon as a resource (which is available either in gaseous or material form) as well as the development of natural and technical greenhouse gases or carbon sinks in the Linz urban area

Residual emissions: the unavoidable quantity of climate-damaging greenhouse gas emissions which a city or an organisation still produces after successful implementation of far-reaching climate change mitigation measures in all areas of activity and which

cannot be reduced; this applies to emissions of chemical processes during production, for example, where no alternative greenhouse gas-neutral production processes are available, and there is a need for such products for a wide variety of uses

Greenhouse gas (GHG) inventory: the representation of the actual state of greenhouse gas emissions of a city or an organisation for all activity areas at a selected date / year measured in tonnes of carbon dioxide equivalents (CO₂eq), the greenhouse gas inventory is the essential scientific basis for the implementation of climate change mitigation targets and measures by the City Government of Linz

Greenhouse gas (GHG) budget: the scientifically determined greenhouse gas emissions, measured in tonnes of carbon dioxide equivalents (CO₂eq), that may still be released into the atmosphere without deviating from the climate targets of the Paris Agreement

Greenhouse gas (GHG) emissions: the emission of climate-damaging greenhouse gases (carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), tropospheric ozone (O₃), etc.) due to human activities (combustion of fossil fuels, changes in land use, etc.) or natural processes

Greenhouse gas (GHG) compensation: Payments made by a city or organisation to reduce greenhouse gases outside its own location; the resulting compensation can generally be offset in the city’s own greenhouse gas balance; strict quality criteria must be respected for greenhouse gas compensation projects and the implementation of the city’s own climate change mitigation measures always has clear priority; in the long term, only the expansion of carbon sinks is available for compensation, which is strictly limited in terms of quantity on a global scale

Greenhouse gas (GHG) monitoring: regular control of own greenhouse gas emissions and the effectiveness review of climate change mitigation measures

Greenhouse gas sink(s) or carbon sink(s): natural ecosystems (forests, moors, soils and oceans) and technologies or procedures which extract greenhouse gases from the atmosphere or extract carbon dioxide effectively from the climate and can store them a stable manner over the long term

Corporate Group of the City of Linz (UGL): The Unternehmensgruppe der Stadt Linz Holding GmbH (Corporate Group of the City of Linz Holding GmbH) is responsible for the administration and management of municipal shareholdings, the provision of services for the Group and associated companies and the definition of strategic objectives and tasks, taking into account the city’s objectives and guidelines. Members of the Corporate Group of the City of Linz are, amongst others: LINZ AG, Gemeinnützige Wohnungsgesellschaft der Stadt Linz GmbH, Immobilien Linz GmbH, Tabakfabrik Linz Entwicklungs- und Betriebsgesellschaft mbH, etc.

Spheres of influence: the spheres of influence of the city’s climate policy with three levels: (i) direct sphere of influence, i.e. the Linz City Administration can implement climate change mitigation measures immediately, and (ii) expanded sphere of influence, i.e. the Linz City Administration can implement effective climate change mitigation measures immediately in coordination with the Corporate Group of the City of Linz and (iii) an indirect sphere of influence, i.e. the Linz City Administration or the Corporate Group of the City of Linz can implement climate change mitigation measures to a limited extent only and with imprecise influence due to lack of competencies

Starting point

The global climate crisis is the biggest civilisational challenge of the 21st century. The effects of global warming caused by human activity can clearly be felt in all regions of the earth. Most of these have a negative impact on the life of each and every individual. Whether heat, flooding or ocean acidification, many climate impacts damage society or nature and can hardly be reversed. However, sustainable development is only possible if immediate measures are taken to mitigate the human-induced climate crisis and adapt to its effects. The solutions must address the immediate causes. These causes are currently ever-increasing global greenhouse gas emissions as well as changes in land use, such as large-scale deforestation of forests for agricultural and forestry purposes. The driving forces in the background are capitalism and materialism / excessive consumption, an unequal power balance, and the exploitation of natural resources.

The global climate crisis: why greenhouse gas emissions must be reduced

According to international climate research, the global human-induced net greenhouse gas emissions were approx. 59 ±6.6 gigatonnes CO₂ equivalent in 2019. The 2019 emissions were 12 % higher than in 2010 and 54 % higher than in 1990 (see Figure 1). Since 1990, the GHG emissions have continued to rise in all main groups of climate-damaging greenhouse gases, although at varying speeds. The most relevant greenhouse gases are CO₂ from the use of fossil fuels, CO₂ from changes in land use, CH₄, N₂O and fluorinated gases (F-gases). Calculations also indicate that, if seen globally, the values of all sectors (except for the traffic sector) are rising again after a short-term decline of GHG emissions during the COVID-19 pandemic and that sector emissions of 2022 were higher than those of 2019.

The human-induced GHG emissions change the atmosphere's composition and enhance the natural greenhouse effect. While the global CO₂ concentration was around 280 ppm (i.e. CO₂ molecules per million air molecules) for several thousand years in the pre-industrial era, it has risen to an average of 416 ppm by 2021, according to measurements at the Mauna Loa station in Hawaii. The immediate consequence of a higher GHG concentration in the atmosphere is that more heat energy remains in our climate system compared to the natural greenhouse gas effect. The physical consequence of this is global warming, which impacts society and nature.

Status quo and impact of the global climate crisis

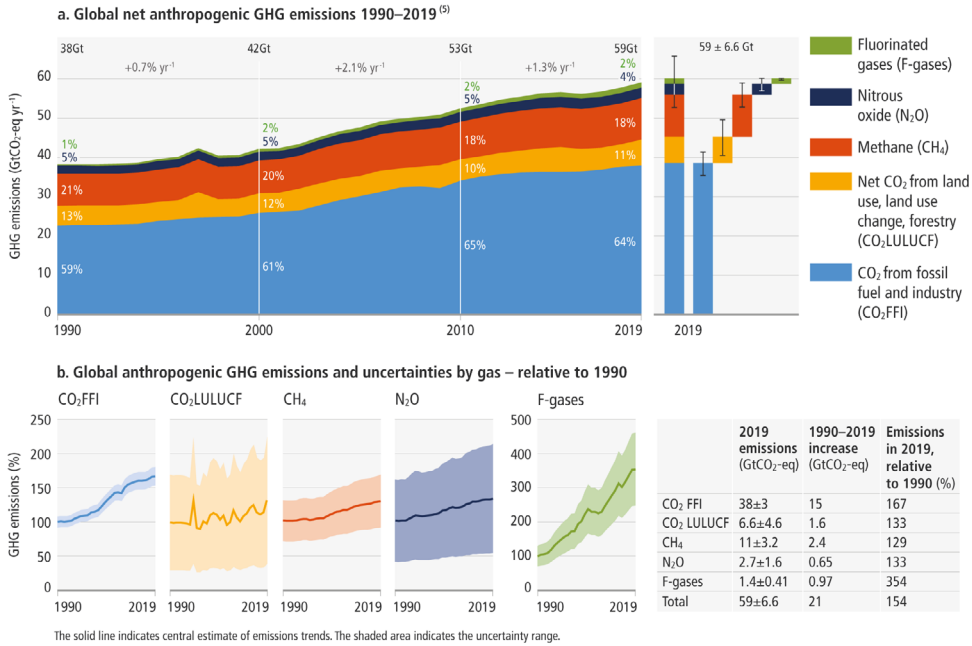
Scientific measurements show that the global surface temperature from 2011 to 2020 was already +1.1 °C higher than the value from 1850 to 1900 due to the human-induced greenhouse effect. The year 2023 was the hottest year since records began (+1.46 °C above the pre-industrial reference period 1850–1900). The frequency and intensity of heat extremes on land and in the ocean due to human-induced warming have also increased. In addition, heavy precipitation, drought periods, and heat waves have led to serious consequences for ecosystems, humans, settlements, and infrastructure globally. Cities and their traffic, water, wastewater, energy, and health systems are particularly under pressure due to actual and expected climate impacts. City dwellers' health, quality of life and security are increasingly affected by these climate impacts. Climate impacts affect economically and socially disadvantaged (i.e. vulnerable) groups to an above-average extent.

Future global climate change and its limitation

According to international climate research, the global surface temperature is expected to rise further and will pass the temperature limits of +1.5 °C or +2 °C (relative to pre-industrial times) by the middle of the 21st century with the same high or insufficiently reduced GHG emission (see Figure 2). Every additional ton of greenhouse gases emitted into the atmosphere due to human activities increases global warming. The more ambitious the joint climate change mitigation policy of all countries is, the more effectively greenhouse gases can be reduced worldwide.

If no additional collective efforts are undertaken towards climate change mitigation and the nationally determined contributions remain the same (nationally determined contributions (NDCs)), global warming up to +2.8 °C is expected by the end of this century. Global warming of up to +3 °C can, therefore, not be excluded. According to the adaptation concept of the City of Linz and with further increase of the average temperature, the following climate impacts, amongst others, are expected for Linz: Increase in heat extremes such as hot days and tropical nights, more frequent and longer dry spells, flooding and more intense heavy rainfall events.

Global net anthropogenic emissions have continued to rise across all major groups of greenhouse gases.



← [Fig. 1] Global human-induced net zero GHG emissions during the period 1990–2019; source: IPCC (2022) Figures AR6-WGIII-SPM-de-IPCC

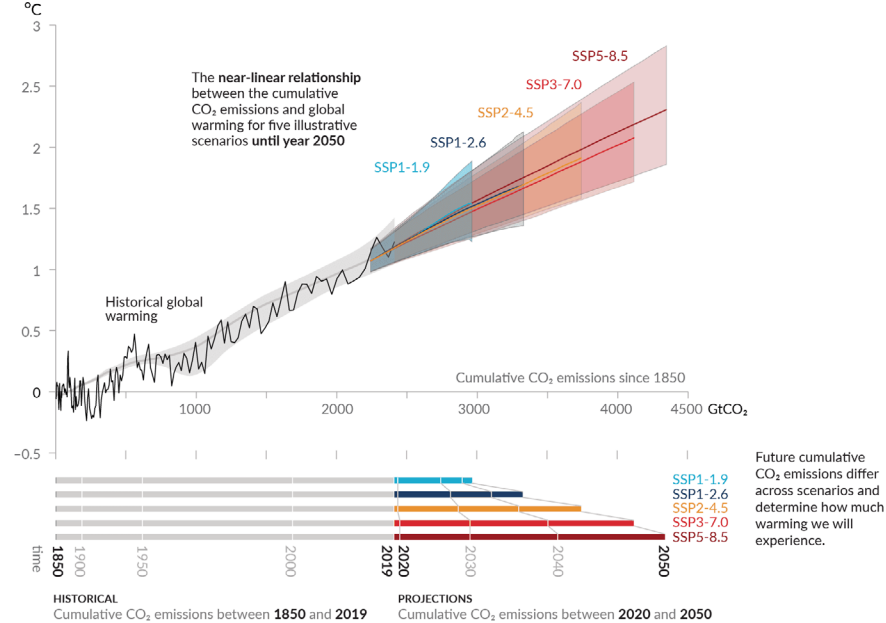
A total of 97 nation-states, which account for 81 % of all global GHG emissions, have announced their commitment to net zero GHG emissions either by legislation, a policy document, or a long-term strategy. However, the United Nations considers confidence in implementing these political commitments to be low. Without ambitious climate change mitigation and if fossil-fuelled development continues, the changes in the climate system will increase, and the impact will be more frequent and intense.

In order to limit human-induced global warming to a safe level for both humans and nature, the cumulative GHG emissions (i.e. the total amount of greenhouse gases that are released into the atmosphere) in all areas or economic sectors must be drastically reduced and, more particularly, net zero CO₂ emissions must be achieved. In addition, other climate-damaging GHG emissions, such as CH₄ from agriculture, coal mining,

gas distribution and landfill, must be reduced rapidly. This helps to prevent the climate system from reaching tipping points in the near future. Tipping points are limits or thresholds at which the climate system reorganises itself abruptly and irreversibly. Examples of acute tipping points are the year-round shrinking of the sea ice cover in the Arctic Ocean or the dying off of tropical coral reefs. It is also clear that G-20 countries with a higher-income population and a greater historical contribution to the climate crisis (e.g. the USA, China, EU countries, etc.) must pursue a more comprehensive climate policy than countries with a medium- to low-income population that have historically emitted less greenhouse gases. Countries of the global North must also provide financial support for countries in the global South in their climate transformation and make green technologies and know-how available. Without global solidarity, effective climate change mitigation is not possible.

Every tonne of CO₂ emissions adds to global warming

Global surface temperature increase since 1850–1900 (°C) as a function of cumulative CO₂ emissions (GtCO₂)



← [Fig. 2] Linear relationship between CO₂ emissions and global warming; source: IPCC (2022) Figures AR6-WGI-SPM-de-IPCC

The Paris Agreement

To what extent is the global climate crisis considered safe or harmless? When can one expect significantly reduced risks? When not? 197 countries and the EU addressed these difficult but important questions at the Paris Agreement on 12 December 2015. Article 2 of the Agreement defines the common goal of keeping the increase in the average global temperature to well below +2 °C above pre-industrial levels and to strive to limit the rise in temperature to +1.5 °C. According to Article 4, global GHG emissions are to peak as quickly as possible, after which a mandatory reduction pathway is to be introduced; in the second half of the 21st century, a balance between GHG emissions and their reduction in greenhouse gas sinks should finally be established. In order to comply with the Paris Agreement, global GHG emissions must decrease by approx. 45 % by 2030 (compared to 2010), and net zero GHG emissions must be achieved by 2050.

The Paris Agreement stipulates that all countries, including Austria, must prepare and submit national contributions, the so-called NDCs (nationally determined contributions) every five years to reduce greenhouse gases. The European Union, together with China, the USA, India, Indonesia, Russia, and Brazil, contribute more than half of the global GHG emissions and, therefore, pursues a particularly ambitious climate policy. For example, the EU climate package Fit for 55 stipulates that European GHG emissions should decrease by -55 % by 2030 compared to 1990 levels (only for those emissions outside the EU Emissions Trading Scheme (ETS)). The whole of Europe should be greenhouse gas-neutral by 2050. This mammoth task will only succeed if, amongst others, renewable energy sources are expanded, emissions trading tightened (expanded to heating and traffic), and a Climate Social Fund is established for socially responsible implementation.

Climate change mitigation and GHG emissions in Austria

According to an intergovernmental agreement, the Republic of Austria is to become climate neutral by 2040. In order to achieve this goal, far-reaching climate change mitigation measures to reduce GHG emissions must be implemented with immediate effect in all areas or sectors to reduce the overall national GHG emission to net zero. At the same time, it is necessary to improve carbon sinks and explore technical possibilities (carbon capture storage and utilisation) to achieve climate neutrality. If the current emissions in Austria continue and no ambitious climate change mitigation measures are implemented, the goal of climate neutrality by 2040 cannot be achieved.

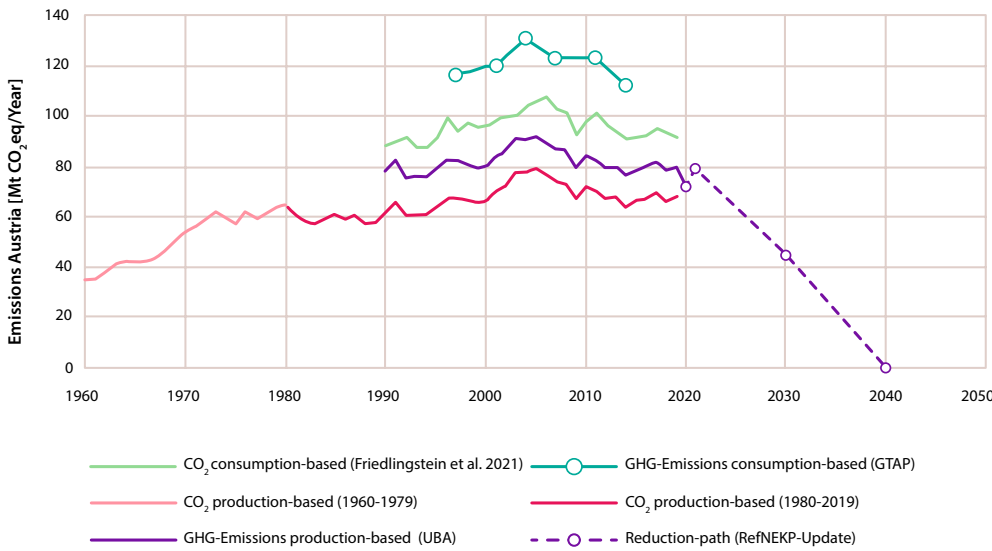
Depending on the approach to greenhouse gas inventories, the GHG emissions in Austria are allocated to different sectors and social groups. A basic distinction is made between the production-based approach and the end-consumer or consumption-based

approach. The difference with the end consumer or consumption-based approach is that in addition to the production-based share of greenhouse gases that is generated domestically, it also includes the share of greenhouse gases that is generated during the manufacture of goods abroad but is attributable to Austria, as these goods are ultimately used or consumed in Austria. This results in approximately 50 % higher total greenhouse gas emissions than the production-based calculation method alone, as the production of Austria’s imports is associated with higher greenhouse gas emissions than the production of Austria’s exports. With the GHG inventory in China, for example, the reverse is true.

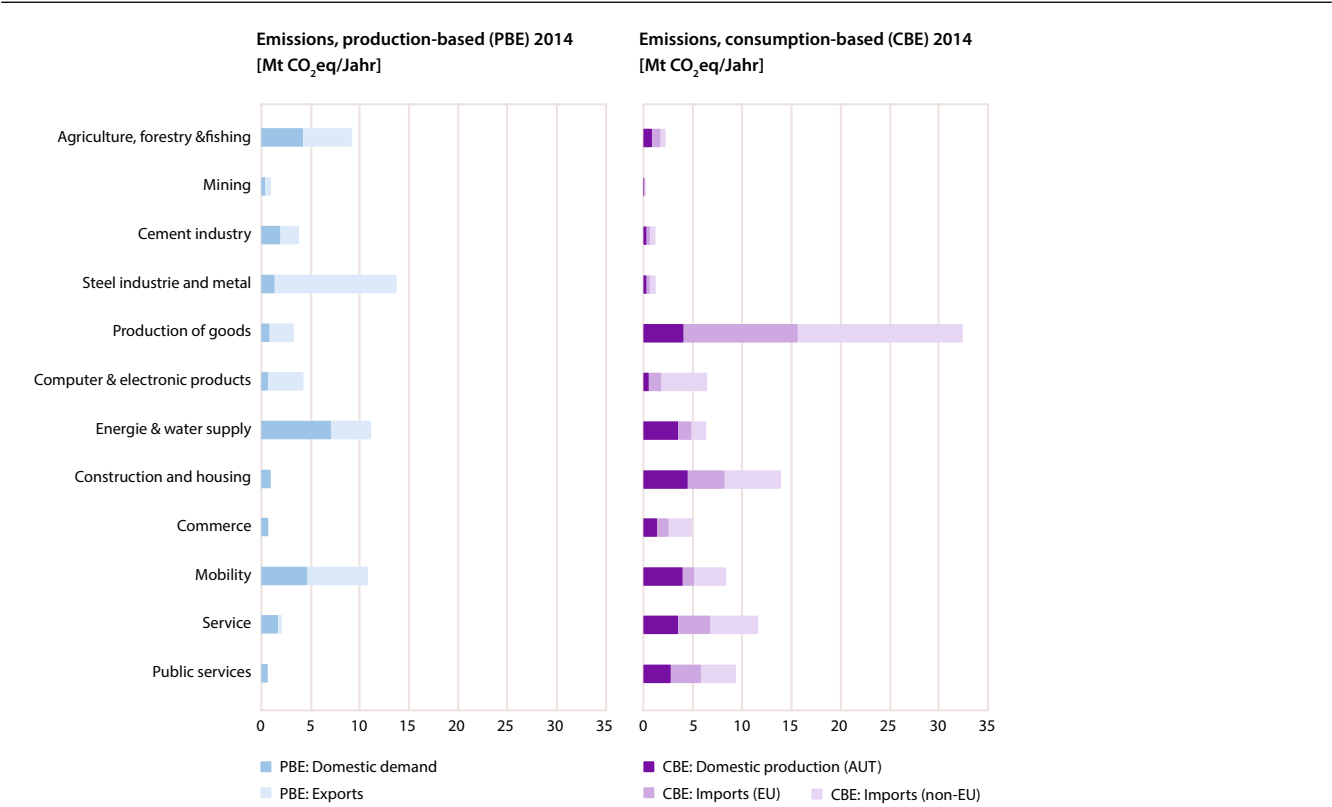
According to the production-based approach, greenhouse gases, up to 80 megatons (Mt) of CO₂eq, were emitted in Austria in 2019 (see Figure 3). The domestic areas with the highest current (production-based) GHG emissions are the sectors of energy and industry, including emissions trading (44.4 %), traffic (27.8 %), buildings (11.7 %) and agriculture (10.6 %). In comparison, waste management (3 %) and fluorinated gases (2.4 %) have low emission levels but must also be defossilised.

There is no consumption-based greenhouse gas inventory for Austria for 2019. The most current data are from 2014, and for this year, conclusions can also be drawn regarding the relationship between production and end-user- or consumption-based GHG emissions. While production-based emissions came to approx. 76 Mt CO₂eq (see Figure 4), consumption-based GHG emissions came to 112.5 Mt CO₂eq and were almost half as high as the production-based approach (see Figure 5).

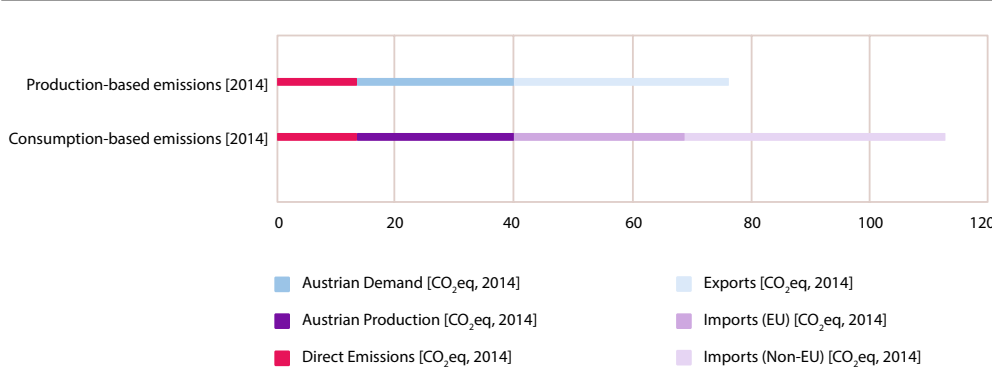
Since 1990, Austria has hardly reduced the overall national greenhouse gas emission (production-based or end user- or consumption-based). This is mainly because the Federal Government has not pursued climate change mitigation measures as an absolute priority, social partners have often blocked effective climate change mitigation measures due to economic and social interests, and civil society’s commitment to climate protection has long been weak. In addition, there is a lack of climate governance that coordinates climate change mitigation as a cross-cutting issue and involves stakeholders from the economy and civil society in policy processes. In addition, it is fundamentally difficult to live in a climate-friendly way in Austria due to insufficient infrastructure, e.g. an incomplete public mobility offer in the rural area, insufficient climate-oriented spatial planning, or lack of an explicit fundamental right to environmental or climate change mitigation. These structural framework conditions regarding climate change mitigation must be improved and guaranteed by 2040.



↑ [Fig. 3] Dynamics of climate-damaging emissions in Austria according to territorial (production-based) as well as consumption-based methods; source: APCC (2023) Technische Zusammenfassung (springer.com)



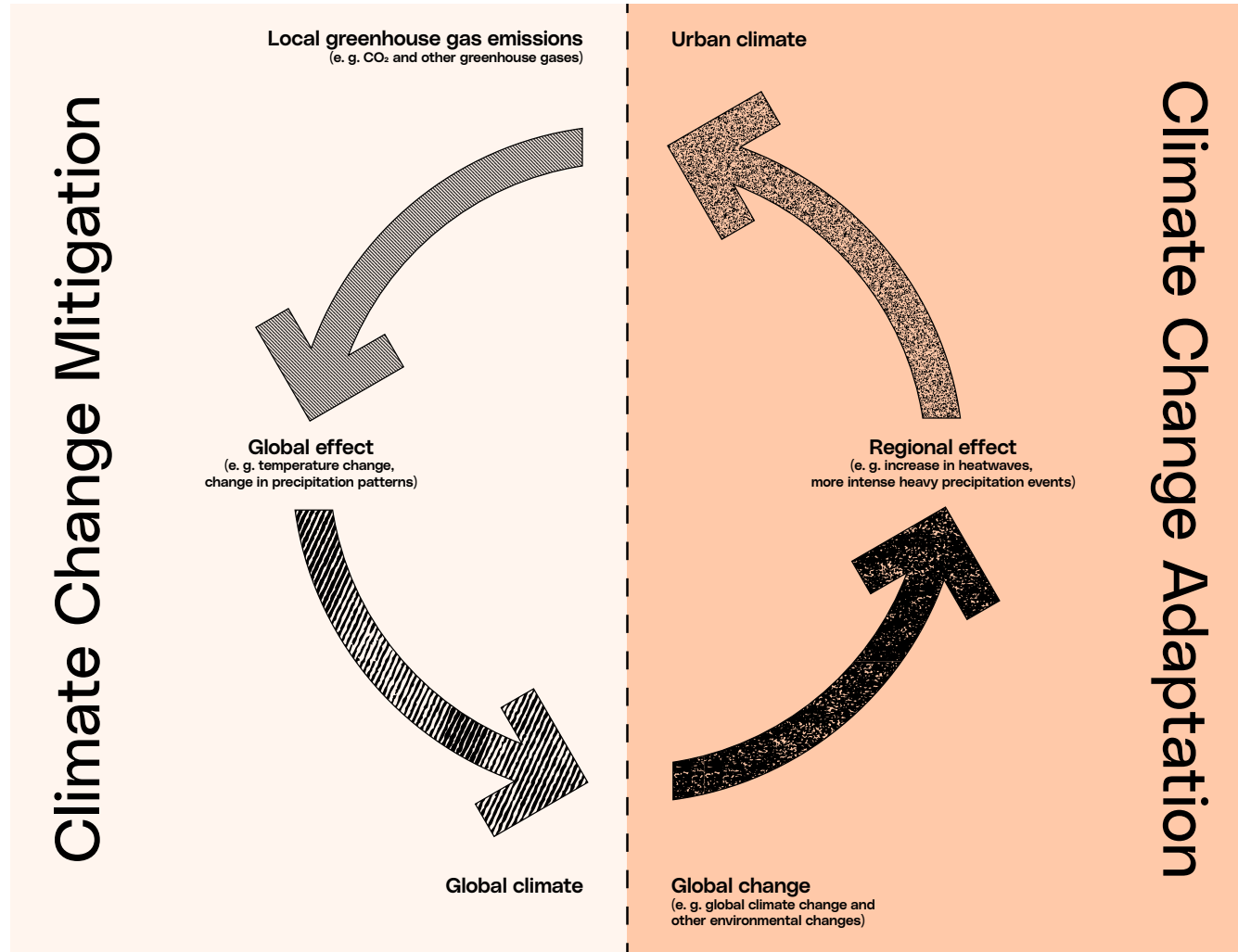
↑ [Fig. 4] Climate-damaging emissions according to economic sectors in Austria. Production-based emissions (Austrian demand and exports) (left). Consumption-based emissions according to economic sectors (Austrian production, EU imports, non-EU imports) (right); source: APCC (2023) Technische Zusammenfassung (springer.com)



↑ [Fig. 5] Direct emissions, Austrian demand as well as imports and exports of climate-damaging emissions in Austria; production-based emissions (top), consumption-based emissions (bottom); source: APCC (2023) Technische Zusammenfassung (springer.com)

Climate policy in the City of Linz: Climate change mitigation as a guiding principle

In 2019, the City Council resolution on the *1st Linz Climate Strategy 2019*, including the declaration of principles and overview of actions, laid the foundation for comprehensive climate work in the industrial and economic City of Linz. This climate strategy consists of two pillars: climate change mitigation and climate change adaptation. Climate change mitigation refers to measures taken to counteract global warming. Climate change mitigation aims at reducing GHG emissions and tackles drivers of human-induced climate change. Climate change mitigation also relates to extracting GHG from the atmosphere and the long-term storage in sinks (CCU technologies, are currently not sufficiently realisable). Besides climate change mitigation, cities must adapt to climate impacts. Climate change adaptation describes the totality of the measures in preparation for already occurred and expected consequences: adaptation lessens negative effects of impacts and seeks opportunities. (see Figure 6).



Development since the 1st Linz Climate Strategy 2019

Since the adoption of the *1st Linz Climate Strategy 2019*, the framework conditions for climate policy in Linz are continuously expanded, and measures are implemented. In 2020, positions for a city climatologist and a climate coordinator were created, the Klimafonds der Stadt Linz was established, and a climate advisory board was convened to advise the City Government. Important technical foundations have also been laid out, and several pilot projects have been implemented or started. In order to become climate neutral by 2040 at the latest, a strategically supported continuation and a significant increase in these efforts are required. The climate change mitigation measures set out in the climate neutrality concept should be backed up with clear financing plans, implemented and their effects regularly reviewed. Furthermore, climate-damaging projects with long-term fossil fuel infrastructure must not be pursued any longer, and climate-damaging subsidies must be reduced to avoid stranded assets (assets that lose value or become completely worthless before the end of their economic life) as far as possible.

With the adoption of the guideline by the Linz City Government in 2021, *Leitlinie der Linzer Stadtregierung 2021–2027 (Linz wird klimafreundliche Industriestadt)*, the Linz City Senate has confirmed climate change mitigation as a central guiding principle in urban development. Climate change mitigation as a municipal task goes beyond a city government's limited term of office or governing period and can only be tackled on a cross-departmental basis.

In view of climate change mitigation, the *Leitlinie der Linzer Stadtregierung 2021–2027* states, amongst others, that:

- Linz's industry causes more than 10 % of all of Austria's CO₂ emissions and Linz therefore lies clearly above other Austrian cities
- The industry based in Linz is a key factor in the city's prosperity and is one of the pioneers in the global transition to climate-friendly production technologies and is set to become even more economically successful
- Linz is to become a centre of excellence for the application of hydrogen technologies
- The City of Linz wants to achieve a clear reduction of CO₂ emissions in the urban area as soon as possible and in line with international climate targets
- The expansion of photovoltaic systems and converting LINZ AG's power plants to renewable energies are necessary

In 2020, the City Council commissioned the Abteilung Stadtklimatologie und Umwelt with the development

of the Linz concept for climate change adaptation. The adaptation concept "*Zukunft Linz – Der klimagerechte Weg von Linz zur Anpassung an den Klimawandel*", including an action programme with initial concrete implementation actions, was unanimously approved by the City Council in 2023. Together with the climate neutrality concept, the adaptation concept thus represents the technical foundation for the climate work of the City of Linz in the coming years.

The City Council resolution regarding developing the city-wide climate neutrality concept includes sector-specific measures followed in 2022.

If possible, climate change mitigation and adaptation should always be pursued coherently and complementary by the Linz City Government. For example, adaptation measures should not increase the city's GHG emissions or complicate the implementation of climate change mitigation measures and vice versa. In urban development practice, however, potential conflicts of objectives may arise. In such cases, balancing solutions should always be sought, and acceptable compromises should be made if no balancing solutions can be found.

Climate change mitigation targets of the City of Linz

The Linz City Government is pursuing several specific climate change mitigation targets. The catalogue of measures for the city-wide climate neutrality concept relates to target values for several activity areas relevant to climate change mitigation. The target values must continuously be accelerated (particularly in the activity area transport / mobility), resulting in ambitious implementations to become climate neutral by 2040. The climate change mitigation measures contained in the climate neutrality concept were derived from the stated target values.

Climate change mitigation targets in the activity area energy:

- Increase in the share of renewable energy in district heating generation to 60 % by 2030, to 80 % by 2035 and complete defossilisation of district heating generation by 2040 (currently 43 %, based on 2021 data)
- Linz AG's district heating market share in the low-temperature heating market is currently around 70 %. The market share is to be increased to 90 % by 2040 through the massive expansion of district heating. The expansion of district heating is intended to reduce the gas infrastructure in accordance with the regulatory framework conditions
- Increase of the renewable energy share in power generation to 50 % by 2030 and complete defossilisation of power generation by 2040 (currently 19 %, based on 2021 data)



- Equal access to renewable energy and combating energy poverty in Linz

Climate change mitigation targets in the activity area transport / mobility:

- Expanding and making public transport attractive in the Linz urban area to 26 % by 2040 (currently 21.4 % in the modal split, based on 2022 data) and increase in passenger numbers
- Decrease in the portion of car journeys by Linz residents as well as non-Linz residents in the Linz urban area to 23 % by 2040 (currently 42.1 % in the modal split, based on 2022 data)
- Increase in the journeys made on foot by Linz residents in the Linz urban area to 26 % by 2040 (currently 25.7 % in the modal split, based on 2022 data)
- Increase the proportion of journeys made by bicycle in the Linz urban area to 25 % by 2040 (currently 10.7 % in the modal split, based on 2022 data)
- Conversion of the entire vehicle fleet of the Corporate Group of the City of Linz to e-cars (currently insufficient data)

Climate change mitigation targets in the activity area buildings:

- Erection of emission-free buildings (zero-emission buildings) with recyclable materials and minimised resources in accordance with the requirements of the Energy Performance of Buildings Directive (EPBD)
- Energy-optimised refurbishment of all existing municipal buildings and increase of the refurbishment rates in accordance with the requirements of the EU Energy Efficiency Directive (EED III, application of the alternative approach)

- Use of CO₂-optimised building products and the integration of accompanying life cycle assessment into urban development planning processes

- Building materials are to be seen as raw materials in the sense of “cradle to cradle”

Climate change mitigation targets in the activity area industry and economy:

- The industry already based in Linz is to be one of the pioneers in the global conversion to climate-friendly production technologies and thereby become even more economically successful
- In the coming years, Linz will become a centre of excellence for applying green hydrogen technologies
- Promotion of a climate neutral and circular economy in the City of Linz

Climate change mitigation targets in the activity area consumption:

- Achievement of the current core criteria of the naBe (sustainable public procurement) action plan for sustainable public procurement for 16 procurement groups
- Promotion of climate-friendly living in the City of Linz
- Climate change mitigation targets in other activity areas:
- Preservation of biodiversity in land and water habitats
- The entire Linz City Administration will become climate neutral in the foreseeable future

The city-wide climate neutrality concept as a living document

As a living document, the climate neutrality concept must be reviewed and adjusted continuously and dynamically against the framework conditions, e.g. new laws of the Republic of Austria relevant to climate change mitigation or further developed standards. As it is intended to have a city-wide effect, it is intended to encourage many stakeholders outside the Linz City Administration and the Corporate Group of the City of Linz to strive for ambitious climate change mitigation in their own sphere.

The climate change mitigation measures in the city-wide climate neutrality concept lead (with ambitious implementation) through mechanisms of avoidance and reduction to net zero GHG emissions in the Linz urban area. However, a few climate change mitigation measures also deal with improving carbon sinks. In Linz, forests and wetlands are regarded as natural GHG or carbon sinks. The renaturalisation of such natural ecosystems can have additional use for the animal and plant species found in Linz besides the long-term storage of carbon from the atmosphere. After a preliminary study by the Naturkundliche Station Stadt Linz, wetlands and smaller marshy ditches could be renaturalised through partial re-wetting. A meadow in the vicinity of the Heilham water works and a ditch in the vicinity of the Traun-Donau-Auen could serve as pilot locations. Both areas have a significantly higher potential to sequester carbon from the atmosphere after successful re-wetting compared to the current situation, whereby long-term carbon sequestration is not easily achievable. The framework conditions governing water and nature conservation must be carefully examined before the start of pilot projects for re-wetting areas in Linz.

Of the total forest area of 1,724 ha in Linz, 500 ha is the property of the City of Linz. As part of a Bachelor thesis in collaboration with the University of Natural Sciences and Life Sciences Vienna, these municipal forests’ naturally stored carbon inventory could be quantified for the first time. A grid of samples, literature sources, and estimation functions for biomass based on the Austrian forest inventory was applied. In the managed forest areas, 204 tonnes of carbon per hectare are currently sequestered. Around 46 % of these are in living trees with a trunk diameter of more than 10 cm at a height of 1.3 m, around 3 % in standing or lying deadwood and 49 % in the ground. The remainder is accounted for by the mulch layer, dead twigs, and trees with a diameter of less than 10 cm. In the examined Natura 2000 forest areas, 189 tonnes of carbon per hectare are currently sequestered. Of this, around 38 % is found in living biomass with a diameter of more than 10 cm at chest

height, around 8 % in standing as well as lying dead wood, and around 53 % in the ground. For so-called pure stands (a forest consisting of a minimum of 80 % of a single tree species), it was determined that the carbon stock per hectare increases up to 110 years. At the age of 130, there is a sharp decrease in carbon storage capacity. Evidence shows mixed stands are superior to pure stands regarding carbon capacity. These research results will be incorporated in an ecologically compatible forest management and silviculture concept for the City of Linz in the coming years. Carbon management and forest resilience will be prioritised more strongly.

In an industrial city like Linz, with a steel and chemical industry with nationwide importance (see Figure 7), the so-called carbon capture and utilisation (CCU) technologies for unavoidable and process-based GHG emissions also play a supplementary role in climate change mitigation. In a narrower sense, CCU describes the utilisation of carbon from CO₂ in concentrated form for using carbon-containing products through chemical and technical-biological processes. For example, plastics or synthetic fuels can be manufactured for aviation and shipping, or the carbon from CO₂ can be incorporated into building materials. Thanks to its local industrial companies, Linz has usable carbon sources. However, there is currently no scientific study on the volume potential, costs, energy consumption, and climate-friendly feasibility of technical CCU solutions for the Linz business location. Separating and utilising CO₂ from exhaust gases is not automatically climate neutral or sustainable. For each procedure, an individual GHG inventory must be created and the CO₂ in the manufactured products should be bound as permanently as possible in the manufactured products, or they should be recycled. There is currently no demand for the CCU procedure for direct capture of CO₂ in the air (Direct Air Capture, DAC) in Linz due to economic disadvantages and technological uncertainties.

↖ [Fig. 7] : Linz industries viewed from the Danube; source: Verein Energiewende Linz

List of references

Alles Linz. (2021). Linz wird klimafreundliche Industriestadt / Leitlinie der Linzer Stadtregierung 2021–2027. URL: <https://alleslinz.at/linz-wird-klimafreundliche-industriestadt/>, zuletzt abgerufen am 12.10.2023, 15:55

APCC. (2023). APCC Special Report: Strukturen für ein klimafreundliches Leben (APCC SR Klimafreundliches Leben) [Görg, C., V. Madner, A. Muhar, A. Novy, A. Posch, K. W. Steininger und E. Aigner (Hrsg.)]. Springer Spektrum: Berlin/Heidelberg.

Baunetz Wissen. (2024). Cradle-to-Cradle-Prinzip. Cradle-to-Cradle-Prinzip | Nachhaltig Bauen | Baustoffe/-teile | Baunetz_Wissen (baunetzwissen.de), zuletzt abgerufen am 05.02.2024, 08:13

BMF. (2023). Carbon Management. URL: https://www.bmf.gv.at/themen/klimapolitik/carbon_management.html, zuletzt abgerufen am 30.10.2023, 15:58

BMK. (2022). Österreich auf dem Weg zu einer nachhaltigen und zirkulären Gesellschaft / Die österreichische Kreislaufwirtschaftsstrategie. URL: https://www.bmk.gv.at/themen/klima_umwelt/abfall/Kreislaufwirtschaft/strategie.html, zuletzt abgerufen am 13.11.2023, 07:35

BMK. (2023). Anpassungsstrategie Österreich. URL: https://www.bmk.gv.at/themen/klima_umwelt/klimaschutz/anpassungsstrategie/oe_strategie.html, zuletzt abgerufen am 13.11.2023, 13:25

BMK. (2023). Das Übereinkommen von Paris. URL: https://www.oesterreich.gv.at/themen/bauen_wohnen_und_umwelt/klimaschutz/1/Seite.1000325.html, zuletzt abgerufen am 06.10.2023, 12:57

BMK. (2023). Die österreichische Klimaschutzstrategie / Politik. URL: https://www.oesterreich.gv.at/themen/bauen_wohnen_und_umwelt/klimaschutz/1/Seite.1000310.html, zuletzt abgerufen am 11.10.2023, 07:55

BMZ. (2023). Klimaabkommen von Paris. URL: <https://www.bmz.de/de/service/lexikon/klimaabkommen-von-paris-14602>, zuletzt abgerufen am 06.10.2023, 12:56

Bundeskanzleramt. (2023). Nachhaltige Entwicklung – Agenda 2030 / SDGs. URL: <https://www.bundeskanzleramt.gv.at/themen/nachhaltige-entwicklung-agenda-2030.html>, zuletzt abgerufen am 30.10.2023, 15:52

CCCA. (2021). CCCA Fact Sheet #32 / Carbon Capture and Utilization (CCU). URL: https://ccca.ac.at/file-admin/00_DokumenteHauptmenue/02_Klimawissen/FactSheets/32_carbon_capture_and_utilization_ccu_202104.pdf, zuletzt abgerufen am 10.11.2023, 14:50

Climate Service Center Germany. (2023). Klimasystem. URL: <https://wiki.bildungsserver.de/klimawandel/index.php/Klimasystem>, zuletzt abgerufen am 30.10.2023, 15:51

Duden. (2023). Klima-Mainstreaming. URL: https://www.duden.de/rechtschreibung/Klima_Mainstreaming, zuletzt abgerufen am 05.09.2023, 15:53

Europäische Kommission. (2023). Der Grüne Deal in Österreich. URL: https://austria.representation.ec.europa.eu/strategie-und-prioritaten/eu-politik-osterreich/der-grune-deal-osterreich_de, zuletzt abgerufen am 13.10.2023, 14:45

Europäische Kommission (2024). Energy Performance of Buildings Directive. URL: Energy Performance of Buildings Directive (europa.eu), zuletzt abgerufen am 05.02.2024, 08:39

Europäische Kommission (2024). Energy efficiency directive. URL: Energy efficiency directive - European Commission (europa.eu), zuletzt abgerufen am 05.02.2024, 08:40

Europäischer Rat. (2023). Ein europäischer Grüner Deal. URL: <https://www.consilium.europa.eu/de/policies/green-deal/>, zuletzt abgerufen am 08.10.2023, 12:17

European Council / Council of the European Union. (2023). Climate change: what the EU is doing. URL: <https://www.consilium.europa.eu/en/policies/climate-change/#:~:text=At%20least%2055%25%20fewer%20emissions%20by%202030,-Exactly%20a%20year&text=As%20an%20intermediate%20step%20towards,greenhouse%20gas%20emissions%20by%202030.&text=This%20goal%20is%20a%20major,of%20cutting%20emissions%20by%2040%25>, zuletzt abgerufen am 08.10.2023, 11:59

Grin, J., Rotmans, H. & Schot, J. (2010): Transitions to Sustainable Development. New Directions in the Study of Long Term Transformative Change. London: Routledge.

IPCC. (2018). Annex I: Glossary / Global Warming of 1.5 °C. An IPCC Special Report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. URL: https://www.ipcc.ch/site/assets/uploads/sites/2/2022/06/SR15_AnnexI.pdf, zuletzt abgerufen am 01.11.2023, 09:22

IPCC. (2018). Summary for Policymakers / Global Warming of 1.5 °C. An IPCC Special Report on the impacts of 1.5 °C above preindustrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. URL: 1,5 °C Globale Erwärmung (Zusammenfassung für politische Entscheidungsträger) (de-ipcc.de), zuletzt abgerufen am 01.11.2023, 11:18

IPCC. (2021). Annex VII / Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. URL: https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_AnnexVII.pdf, zuletzt abgerufen am 01.11.2023, 09:37

IPCC. (2021). Climate Change 2021 / The Physical Science Basis. URL: https://report.ipcc.ch/ar6/wg1/IPCC_AR6_WGI_FullReport.pdf, zuletzt abgerufen am 09.11.2023, 15:02

IPCC. (2022). Climate Change 2022 / Mitigation of Climate Change. URL: https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_Full-Report.pdf, zuletzt abgerufen am 09.11.2023, 15:03

IPCC. (2022). Klimawandel 2022 / Folgen, Anpassung und Verwundbarkeit / Zusammenfassung für die politische Entscheidungsfindung. URL: https://www.de-ipcc.de/media/content/AR6-WGII-SPM_deutsch_barrierefrei.pdf, zuletzt abgerufen am 05.10.2023, 15:03

IPCC. (2022). Klimawandel 2022 / Minderung des Klimawandels / Zusammenfassung für die politische Entscheidungsfindung. URL: https://www.de-ipcc.de/media/content/AR6-WGIII-SPM_deutsch_barrierefrei.pdf, zuletzt abgerufen am 04.10.2023, 14:55

IPCC. (2023). Synthesebericht zum Sechsten IPCC-Sachstandsbericht (AR6) / Hauptaussagen aus der Zusammenfassung für die politische Entscheidungsfindung (SPM). URL: https://www.de-ipcc.de/media/content/Hauptaussagen_AR6-SYR.pdf, zuletzt abgerufen am 02.10.2023, 09:30

Land OÖ. (2023). Pressemitteilung: Ergebnis der Oö. Verkehrserhebung 2022 / Das Mobilitätsverhalten der Wohnbevölkerung und das Verkehrsaufkommen. URL: https://www.land-oberoesterreich.gv.at/Medien-dateien/LK/Ergebnis%20der%20O%c3%b6.%20Verkehrserhebung%202022_Linz%20Stadt.pdf, zuletzt abgerufen am 06.12.2023, 08:50

LINZ AG. (2021). Umwelt- und Nachhaltigkeitsbericht 2021. URL: https://www.linzag.at/portal/de/ueber_die_linzag/medien/infomaterial_bestellung/infomaterial/infomaterial_detail_61444.html, zuletzt abgerufen am 18.07.2023, 13:15

Paul, S. & Schellenberger, A. (s.a.). Organische Böden, Klima und der Kohlenstoffmarkt. URL: https://edoc.unibas.ch/41742/2/Bulletin_36_Paul.pdf, zuletzt abgerufen am 10.08.2023, 14:25

Potsdam-Institut für Klimafolgenforschung. (2019). Kippunkte im Klimasystem. URL: <https://www.pik-potsdam.de/~stefan/Publications/Kippunkte%20im%20Klimasystem%20-%20Update%202019.pdf>, zuletzt abgerufen am 08.10.2023, 11:30

Presse- und Informationsamt der Bundesregierung Deutschland. (2023). EU-Klimaschutzpaket: Fit for 55. URL: <https://www.bundesregierung.de/breg-de/schwerpunkte/europa/fit-for-55-eu-1942402#:~:text=Europa%20soll%20bis%202050>

%20klimaneutral,mehr%20als%20zw%C3%B6lf%20Gesetzesnovellen%20vorgestellt, zuletzt abgerufen am 08.10.2023, 12:13

Scientists 4 Future Österreich. (2022). Scheinklimaschutz in Österreich. URL: <https://at.scientists4-future.org/2022/04/28/scheinklimaschutz-in-oesterreich/>, zuletzt abgerufen am 25.07.2023, 11:58

Spektrum. (2023). Klimasystem. URL: <https://www.spektrum.de/lexikon/geographie/klimasystem/4168>, zuletzt abgerufen am 30.10.2023, 15:50

Stadt Linz. (2021). Auf die Plätze, fertig, Linz / Mobilitätskonzept für die Stadt Linz. URL: https://www.linz.at/images/files/mobilitaetskonzept_auf_die_plaetze_fertig_linz.pdf, zuletzt abgerufen am 10.08.2023, 09:20

Stadt Linz. (2022). Linzer Stadtstrategie. URL: <https://www.linz.at/media/stadtentwicklung/Linzer-Stadtstrategie-2022.pdf>, zuletzt abgerufen am 23.10.2023, 15:11

Stadt Linz. (2022). Unternehmensstrategie des Magistrats der Landeshauptstadt Linz. URL: https://www.linz.at/images/files/unternehmensstrategie_magistrat_linz.pdf, zuletzt abgerufen am 24.10.2023, 08:27

Stadt Linz. (2023). Zukunft Linz / Der klimagerechte Weg von Linz zur Anpassung an den Klimawandel. URL: https://www.linz.at/media/umwelt/Anpassungskonzept_Zukunft_Linz_2023.pdf, zuletzt abgerufen am 04.08.2023

UNEP. (2023). Emission Gap Report 2023 / Broken Record / Temperatures hit new highs, yet word fails to cut emissions (again). URL: <https://wedocs.unep.org/bitstream/handle/20.500.11822/43922/EGR2023.pdf?sequence=3&isAllowed=y>, zuletzt abgerufen am 24.11.2023, 08:42

United Nations. (2023). For a liveable climate: Net-zero commitments must be backed by credible action. URL: <https://www.un.org/en/climatechange/net-zero-coalition>, zuletzt abgerufen am 08.10.2023, 11:35

Universität Wien. (2023). Treibhausgasbilanz 2019. URL: <https://nachhaltigkeit.univie.ac.at/nachhaltigkeitsstrategie/treibhausgasbilanz/>, zuletzt abgerufen am 01.11.2023, 10:26

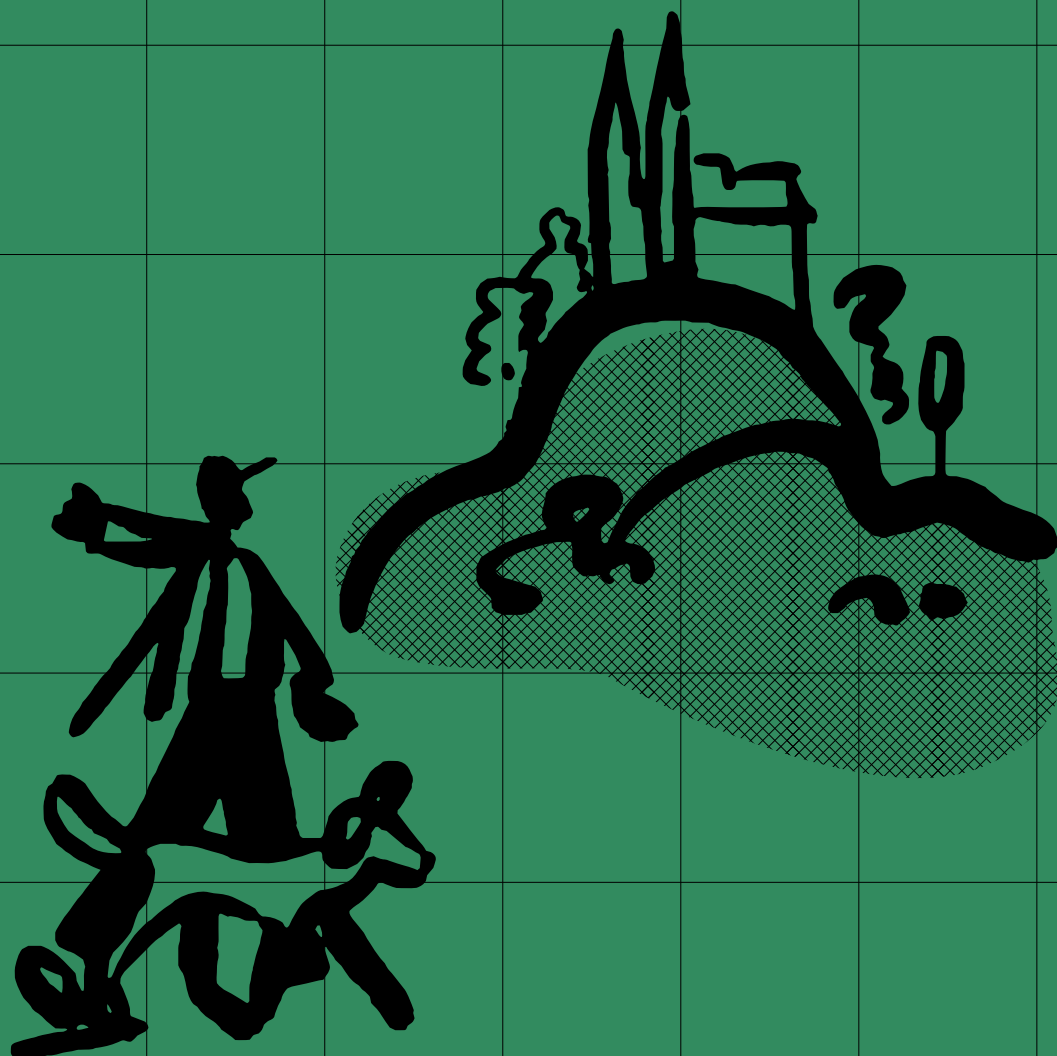
Unternehmensgruppe Stadt Linz. (2023). Wir bewegen Linz. URL: <https://www.linz.at/images/files/UGL-Broschuere.pdf>, zuletzt abgerufen am 22.11.2023, 12:30

WEGC. (2021). Institutional Carbon Management (ICM). URL: [https://wegcwp.uni-graz.at/carbmanage/de/wecarb-icm-de/#:~:text=\(a\)%20Netto%2DNull%3A,Reduktionsanteil%20weniger%20als%2090%20%25%20ist](https://wegcwp.uni-graz.at/carbmanage/de/wecarb-icm-de/#:~:text=(a)%20Netto%2DNull%3A,Reduktionsanteil%20weniger%20als%2090%20%25%20ist), zuletzt abgerufen am 01.11.2023, 09:57

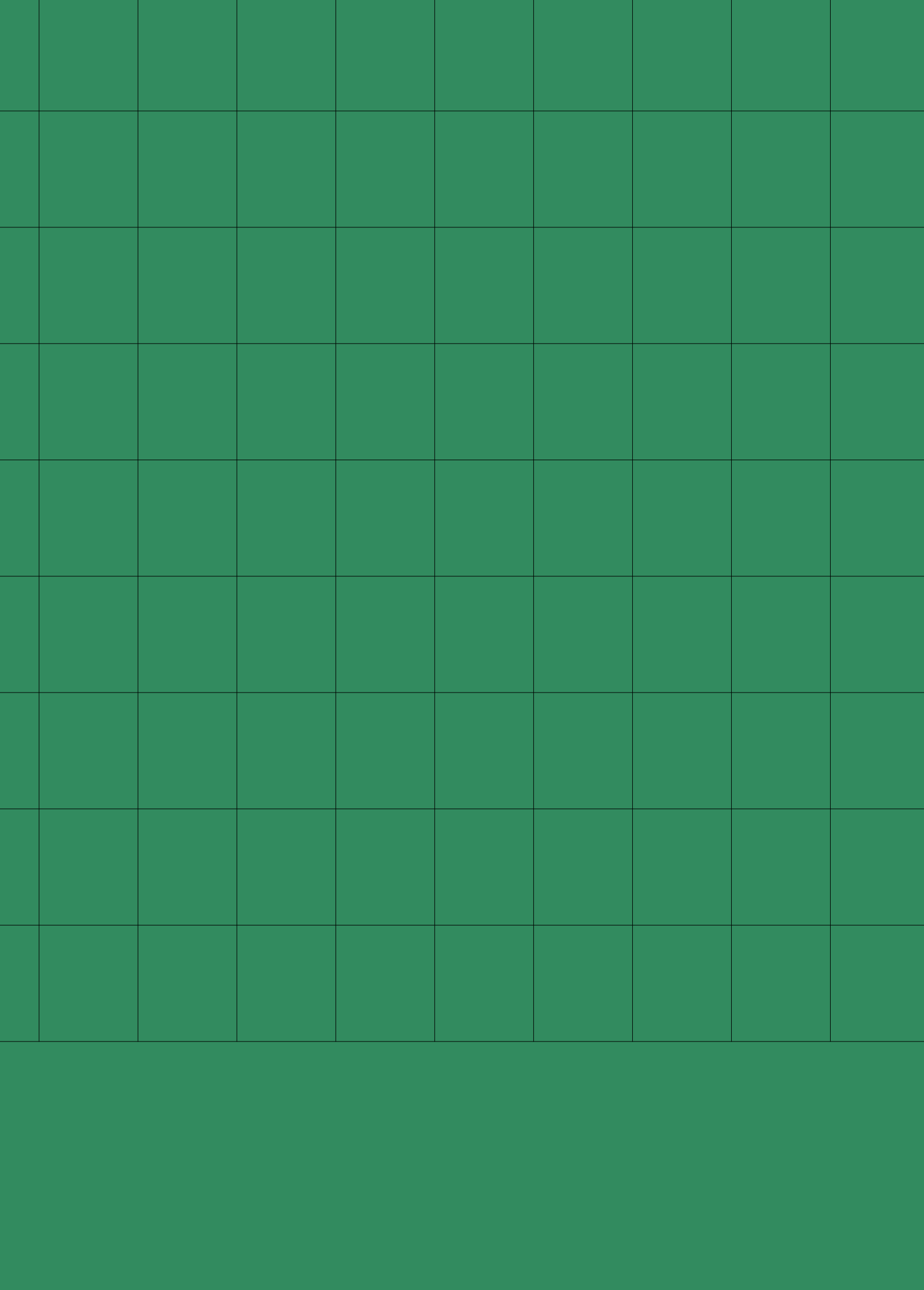
WEGC. (2023). Carbon Tracer / Ein Service der Universität Graz für Carbon Management zur Berechnung der Treibhausgas-Emissionen aus dem Bereich Mobilität. URL: <https://carbontracer.uni-graz.at/>, zuletzt abgerufen am 01.11.2023, 09:56

Space for notes																			

03	Vision 2040: Linz becomes a climate neutral industrial city
06	Methodology and development process: Rethinking collaboration
10	Citizen participation
15	List of references



03



Vision 2040: Linz becomes a climate neutral industrial city

The transformation of Linz to a climate neutral industrial city strengthens Linz as an industrial and business location and guarantees prosperity and quality of life for present and future generations. For example, the prioritisation of sustainable forms of mobility (cycling, walking, public transport) improves air quality. With the expansion of renewable energy, an affordable electricity and heating supply is guaranteed. A socially just existence and climate-oriented urban development promotes neighbourhoods worth living in. Linz as an industrial and business location, will benefit from the climate transformation as a whole and will thus remain competitive in the long term.

For a capital city like Linz, climate change mitigation means taking responsibility. As providers, cities shape the public framework, determining whether and how residents can lead climate-friendly lives. Cities provide electricity and heating, provide social and cultural services, build social housing and manage roads or public transport.

using guided interviews. The interviews resulted in a future vision for the City of Linz in 2040 worth striving for:

The City of Linz carries a fundamental responsibility:

- To significantly contribute towards the targets of the Paris Agreement through the reduction of GHG emissions and the development of carbon sinks in the Linz urban area
- That all citizens can partake in the transformation on an equal footing and that a climate-friendly life is affordable for present and future generations

There are still 16 years until 2040. To achieve climate neutrality, the City of Linz must take far-reaching climate change mitigation measures in all activity areas in these 16 years. It is recommended to set milestones that must be reached along the way. As a rough guide, the City of Linz should strive for a GHG reduction of a minimum of -60 % (relative to the base year 2019) by 2030.

The members of the Linz City Senate bear a great responsibility to the people of Linz in their democratically legitimised political function. Depending on their departmental responsibilities, they oversee seven climate neutrality concept activity areas. To involve the members of the City Senate in developing the concept and to include their perspectives on the future, the members of the City Senate were asked about their positions on climate neutrality in 2040 and their priorities for climate change mitigation measures

“The citizens live in one of Europe’s most modern and successful industrial cities. In this way, social prosperity for the next generation is secured. In addition, the quality of life is also characterised by a large share of green infrastructure.”

Transformation in the past / Linz looks back

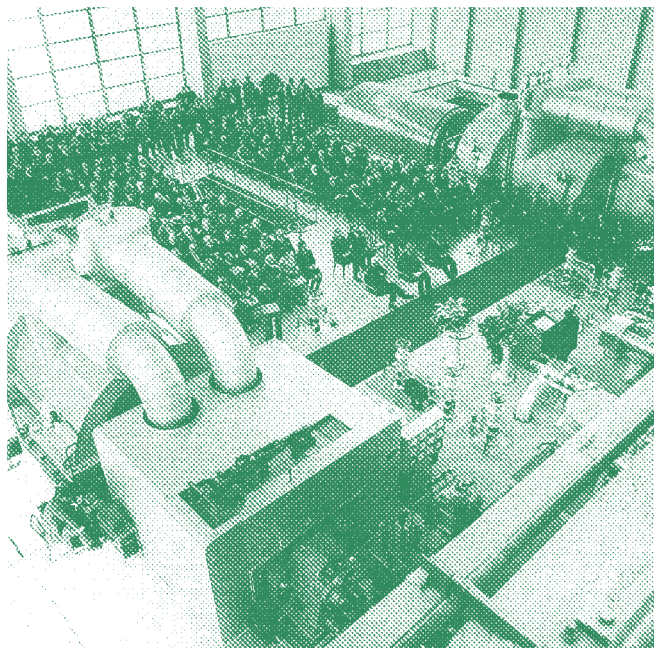
According to the Scientific German Advisory Council on Global Change (WBGU), we are currently transitioning from the carbon age to a climate neutral future. This transition started with the Industrial Revolution in the 19th century and is often called climate transformation. Crises or other upheavals generally initiate major transformations or reorganisations and profoundly change social structures. They change the economic system and also have an impact on social co-existence. Since the first settlement during the Neolithic period, the history of the City of Linz has been characterised by countless major transformations and reorganisations. The aim here is to show selected historical examples of past transformation achievements in Linz, which, although not directly comparable with the global climate crisis, speak of political courage, innovative technology, and social cohesion. These three ingredients will also determine the path to the climate neutral industrial City of Linz by 2040 at the latest.

Reconstruction after 1945

In May 1945, it was “zero hour” for the City of Linz with the liberation from Nazi rule by US troops and the inauguration of Mayor Ernst Koref. The local political challenges were enormous. In his memoirs, Koref said that never before in its history had the City of Linz faced such major problems. A third of the houses in Linz were damaged, 20,000 persons were homeless, the food situation was catastrophic, the City’s infrastructure (public transport, the sewerage system, water, gas and electricity) first had to be made operational again, and the heavily bomb-damaged industrial plants needed to be rebuilt (see Figure 8 and 9). Austria was not considered viable after the Second World War. The climate transformation in Linz will also go down in the City’s history as a major historical endeavour.

District heating supply

In 1858, the Linz gasworks on Kaplanhofstrasse are the first to go into operation in Upper Austria. Since 1880, the gas engine has also entered industry and trade. Gas remained Linz’s number one household energy source in the late 1930s. All appliances known at the time, from the iron to the fridge, were powered by gas. From 1970 onwards, the district heating plant Linz-Mitte supplied the city with district heating and electricity, and by 1974, all gas appliances in the city were converted to natural gas (see Figure 10). The share of renewable energy in district heating in Linz is currently 43 %, demonstrating the great dependence on fossil natural gas. The gradual defossilisation of district heating production by 2040 poses a great but achievable challenge.



↑ [Fig. 8] Removal of air raid shelter at the Hauptplatz 1946; source: Archiv der Stadt Linz

↑ [Fig. 9] Road works 1947 in the Unionstrasse; source: Archiv der Stadt Linz

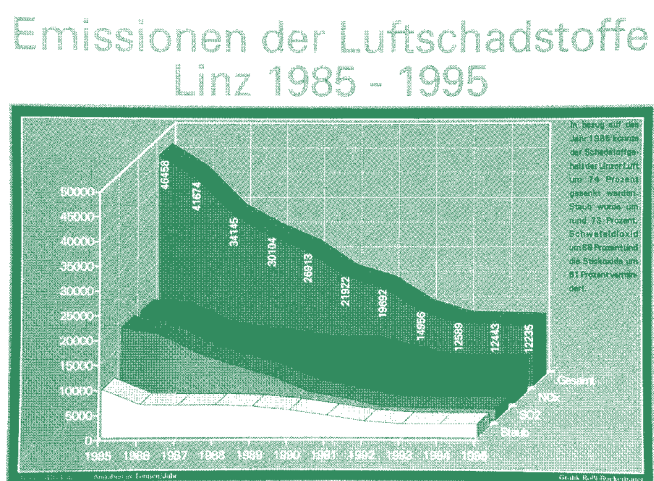
↑ [Fig. 10] Opening of the ESG Fernheizwerkes at the Nebingerstrasse on 29 April 1971; source: Archiv der Stadt Linz

Restricted traffic zones

Linz was the first Austrian city to react to the increasing global motorisation with the Generalverkehrsplan of 1957. Stationary traffic became more and more of a problem, especially in the inner city area and, more specifically, at the Hauptplatz, which had become a huge parking lot. Through bypasses, the Landstrasse (1977), the Hauptplatz (1979), the Schmidttor (1981) and the Herrenstrasse (1982) could be converted into restricted traffic zones (see Figure 11). In September 2022, the Hauptplatz became a shared zone (restricted traffic zone with precedence for pedestrians). After the opening of the Westringbrücke in 2024, the Hauptplatz is to be freed from through-traffic.

Air pollution control and citizen initiative *Linzer Luft*

Today, industry and healthy air are no longer contradictions in Linz. The somewhat older prejudice that it stinks in Linz is also outdated. For many years, the City has been recognised as a clean industrial city with good air quality because Linz’s citizens and politicians have done a lot to achieve this. At the beginning of the 1980s, air pollution increased rapidly with the industry’s growth. The emissions of air pollutants such as sulphur dioxide, nitrogen dioxide, and dust peaked in 1985. At the same time, the *Linzer Luft* citizens’ initiative was formed, successfully triggering public pressure on the economy and the City Government with signature campaigns, silent marches, its own newspaper and demands. The Linz business community, on the other hand, portrayed the members of this citizens’ initiative as job destroyers and green nutcases. An “Air Summit” was subsequently held in the Linz Rathaus on 25 January 1985. The main concern of Linz’s Mayor Schanovsky was financing the catalogue of measures for air pollution control in the amount of 4.5 million Schilling, which was developed in agreement with large companies. “Black Friday” on 13 July 1986, when the limit value for sulphur dioxide emissions was exceeded more than eightfold and highly toxic cyanide flowed into the Danube, brought the necessity of political action into focus. The historical example of air pollution control demonstrates that a transformation, which is a win for all sides, is possible if the population, politics, industry, and economy work together despite all differences of opinions (see Figures 12 and 13). A similar solidarity can also increasingly be observed in the climate transformation in Linz.



↑ [Fig. 11] Opening of the pedestrian zone in the Landstrasse, 1977; source: Archiv der Stadt Linz

↑ [Fig. 12] Representatives of the citizen initiative “Linzer Luft” with Mayor Hillinger, 1983; source: Archiv der Stadt Linz

↑ [Fig. 13] Decrease in air pollutants in the period 1985–1995 (historical representation); current annual values are available and are published on the homepage of the City of Linz; source: Archiv der Stadt Linz

Methodology and development process: Rethinking collaboration

The technical development of the city-wide climate neutrality concept posed the challenge of carrying out a development process that was new for Linz. The development process was therefore characterised by and aimed at broad-based climate mainstreaming which was intended to strengthen the inter-departmental and inter-organisational collaboration within the Linz City Administration and the Corporate Group of the City of Linz.

Applied international standards and guidelines

The development of the concept was methodologically informed by and followed the international standard of the *Greenhouse Gas Protocol for Cities – An Accounting and Reporting Standard for Cities*, the *International Workshop Agreement IWA 42: Net Zero Guidelines Accelerating the transition to net zero* of the International Organisation for Standardisation (ISO) and the *Sixth Assessment Report (AR6)* of the IPCC. The ISO guideline 14068 – *Greenhouse gas management and climate change management and related activities* was still being prepared during concept development and could therefore not be considered.

Scientific monitoring and review

The Wegener Center for Climate and Global Change of the University of Graz and members of the Climate Advisory Board City of Linz scientifically assessed the city-wide climate neutrality concept. The Wegener Center for Climate and Global Change of the University of Graz developed a GHG inventory, a GHG budget for the City of Linz up to 2040, and made recommendations for GHG monitoring. In addition, climate change mitigation preparatory work within the City (e.g. the project *KlimaStadtLinz2030* and various projects from the Klimafonds der Stadt Linz) was examined, and the development of measures was supported.

For the evaluation of the climate policy efforts and the level of ambition of climate change mitigation measures of the City of Linz, particularly for the evaluation criterion “transformation” potential, an assessment framework for the climate neutrality concept was used, which was originally developed by researchers of the CRC research team at the Royal Roads University in British Columbia, Canada. *The Local Government Climate Action Assessment Framework, as described by Jost et al. (2020)*, stands out because of its strong practical relevance and high policy relevance. This was adapted by the Wegener Center for Climate and Global Change 2022 and translated for the Austrian context. The assessment framework includes a representation of three climate policy development paths: (i) incremental, i.e. not very ambitious; (ii) reformative, i.e. partially ambitious; and (iii) transformative, i.e. highly ambitious. Each climate change mitigation measure is assigned to one of the three development paths individually in the chapter on measures, thereby allowing readers a differentiated and policy-relevant insight into which development path the Linz City Government is following when adopting climate change mitigation measures. By making these elective policy development paths visible, the assessment framework can support city decision-makers in initiating a systematic path change. The qualitative assessment framework by Wilfinger et al. (2022) was supplemented by the research results of Morrison et al. (2022) during the development of the climate neutrality concept. The latter differentiates between palliative, hopeful, tactical, partial, strategic and far-reaching climate change mitigation measures and summarises the adaptations in three categories: (i) a limited, slow, or maladaptive change (ii) a rudimentary intensification or acceleration of change and (iii) a profound change of society towards climate neutrality.



Inter-departmental and inter-organisational collaboration process

From October 2022 until June 2023, 52 colleagues from particularly climate-relevant business divisions of the City Government and the Corporate Group of the City of Linz were involved in the development process.

Here is an overview:

- Magistratsdirektion (project principal)
- Geschäftsbereich Büro Stadtregerung Linz (project lead)
- Geschäftsbereich Planung, Technik und Umwelt
- Geschäftsbereich Gebäudemanagement und Tiefbau
- Geschäftsbereich Finanzen
- Geschäftsbereich Bau- und Bezirksverwaltung
- Geschäftsbereich Stadtgrün und Strassenbetreuung
- LINZ AG
- Gemeinnützige Wohnungsgesellschaft der Stadt Linz GmbH
- Immobilien Linz GmbH
- City Management Linz GmbH (dissolved as of 01/07/2023)

The 52 colleagues formed eleven task forces, i.e. a sub-project group for each business division and each UGL company. These task forces had the assignment to gather preliminary work in the respective divisions, make internal decision processes transparent, define responsibilities regarding climate neutrality, and report effective climate change mitigation measures. During the project period, the task forces were invited to submit four written comments and were able to participate in so-called consultation days to prepare for the project. Experts from Austrian climate research, other cities, associations and NGOs, the Federal Ministry for Climate Change Mitigation, and the State of Upper Austria were invited to the consultation days to share best-practice examples with the task forces. This created an innovative learning environment. In addition, the Climate Advisory Board City of Linz and technical experts from the network of the Abteilung für Wirtschaft, Innovation, Klimaschutz und EU were involved, which meant that the development process involved more than 80 people (see Figure 14 – 16). The alpS GmbH supported the City of Linz with stakeholder management.

↑ [Fig. 14] Kick-off (kick-off event) on 12/10/2022: source: Stadt Linz, Dworschak

Timeline of the entire city-wide development process:

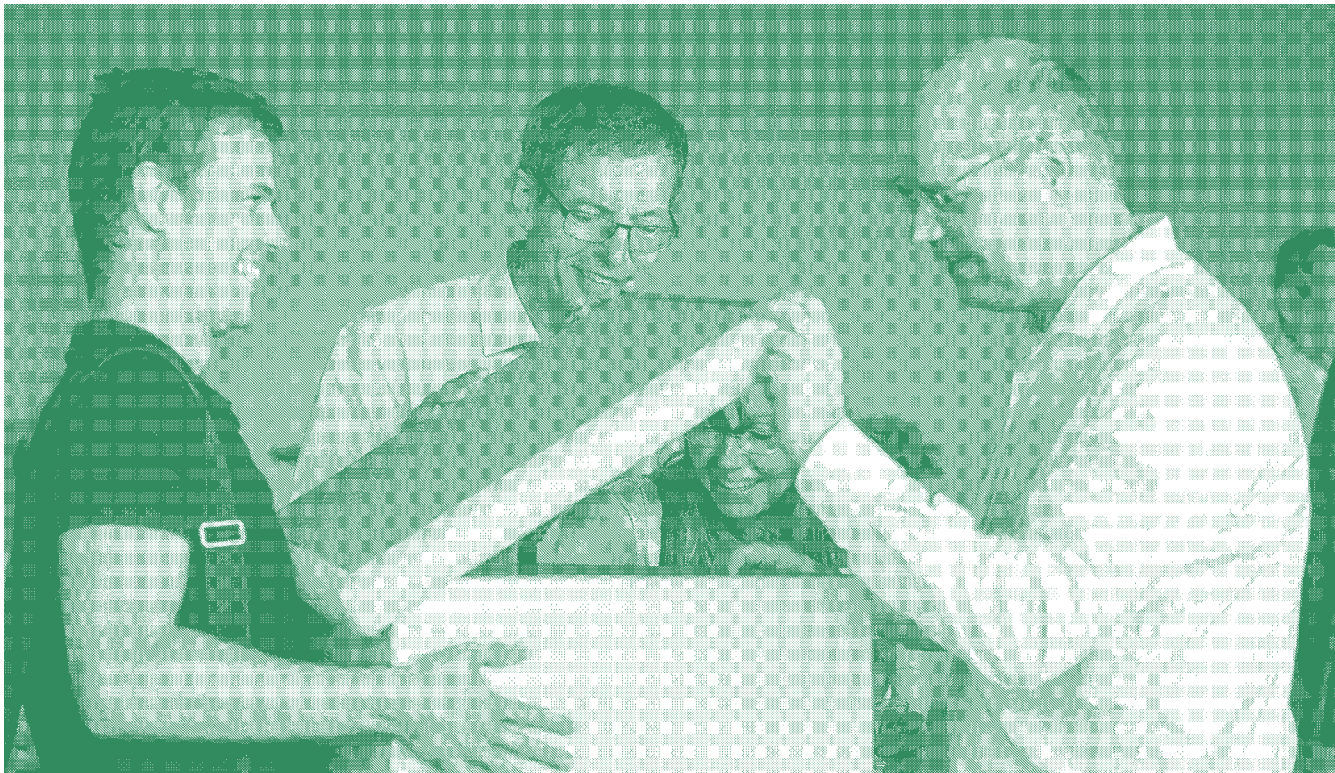
- Preparation phase from January 2022
- Kick-off (kick-off event) on 12/10/2022
- Consultation day “Energy” on 30/11/2022
- Consultation day “Buildings” on 18/01/2023
- Consultation day “Traffic / mobility” on 27/02/2023
- Synchronisation (milestone meeting) on 29/03/2023
- Consultation day “Industry & Consumption” on 18/04/2023
- Synthesis (closing event) on 21/06/2023
- Writing phase from July 2023

The task forces were supported on the consultation days by the following institutions:

- Bundesministerium für Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie (Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology)
- Bundesverband Elektromobilität Österreich (Federal Association for Electromobility Austria)
- Energieinstitut an der Johannes-Kepler-Universität Linz (Energy Institute at the Johannes Kepler University Linz)
- Fachhochschule Oberösterreich (University of Applied Sciences Upper Austria)
- Klimaaktiv
- Klimabündnis Oberösterreich (Climate Alliance Upper Austria)
- State of Upper Austria
- LAT Nitrogen Linz GmbH

- Neue Heimat Tirol
- Österreichische Energieagentur (Austrian Energy Agency)
- Österreichische Gesellschaft für Umwelt und Technik
- Österreichische Koordinationsstelle für Energiegemeinschaften des Klima- und Energiefonds (Austrian Coordination Office for Energy Communities of the Climate and Energy Fund)
- Regionalmanagement OÖ GmbH
- Scientists for Future OÖ
- SIR – Salzburger Institut für Raumordnung und Wohnen (Salzburg Institute for Spatial Planning and Housing)
- Technische Universität Wien (Technical University of Vienna)
- VCÖ – Mobilität mit Zukunft (Mobility with a Future)
- Verein Energiewende Linz (Association for Energy Transition Linz)
- Walk-Space.at / Der Österreichische Verein für Fußgänger*innen (Austrian Association for Pedestrians)
- WeFair – Verein zur Förderung eines fairen und ökologischen Lebensstils (Association for the Promotion of a Fair and Ecological Lifestyle)
- WIVA P&G – Wasserstoffinitiative Vorzeigeregion Power & Gas (Hydrogen Initiative Flagship Region Austria Power & Gas)
- Zeininger Architekten

The city-wide concept development process was honoured with the winning project by the Österreichischen Verwaltungspreis in Kategorie 5 – Ökologische Nachhaltigkeit, Energieeffizienz und Klimaschutz (Austrian Public Administration Award in Category 5 – Ecological Sustainability, Energy Efficiency and Climate Change Mitigation) in 2023.



↑ [Fig. 15] Consultation day “Energy” on 30/11/2022; source: Stadt Linz, Sturm
↑ [Fig. 16] Synthesis (closing event) on 21/06/2023; source: Stadt Linz, Sturm

Citizen participation

Not only were the technical experts from the Linz City Administration and the Corporate Group of the City of Linz involved with drafting the city-wide climate neutrality concept, but also the citizens. This step was necessary to hear and better understand everyday perspectives on climate change mitigation measures. Interested citizens were also able to determine their own climate change mitigation measures. The citizen participation was based on a survey and resulted in a citizen panel together with the UniNEtZ project of the Allianz Nachhaltige Universitäten in Österreich (Alliance of Sustainable Universities in Austria). Through participation, a common understanding of the vision of the climate neutral industrial city Linz 2040 was promoted, and gaps could be closed in the catalogue of measures.

Survey on the topic of climate neutrality in Linz

To develop the climate neutrality concept, it was important to find out how the people of Linz feel about the municipal climate policy and the climate change mitigation measures. Mayor Klaus Luger, therefore, commissioned the Abteilung Wirtschaft, Innovation, Klimaschutz und EU in collaboration with the Abteilung Stadtforschung to survey between 25 August and 24 September 2023. The participants were selected by drawing a random sample according to gender, age, and city district from the population register, and they are representative of the population of Linz concerning these three characteristics. From the beginning of the survey, 13,000 persons aged 16 and over who had their main residence in Linz since 10/08/2023 received an invitation by post to participate in the survey about the climate neutrality concept. The survey could be accessed via a QR code or an online access link.

Key survey data:

Population approx. 181,000 persons
Sample size: 13.000
Questionnaires that could be analysed: 1,660
Participation rate: 12.8 %

Summary of the results of the survey

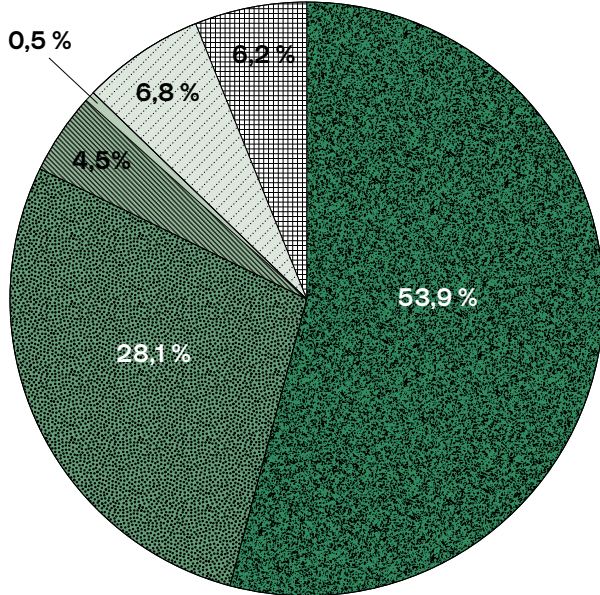
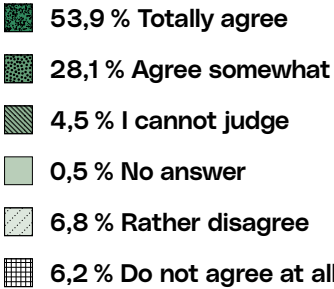
The survey questions comprised personal issues relating to climate change mitigation or climate neutrality, opinions about the Linz climate policy, and special issues relating to climate change mitigation measures for each activity area of the climate neutrality concept.

The survey results showed that climate change mitigation is a big concern for participating Linz residents. Nearly 90 % of participants talk often or on occasion about climate change mitigation with family, friends, or acquaintances. Around 88 % of people surveyed assume that climate change will impact (rather) negatively on their personal living conditions. Younger people, however, are far more negative about the personal impact on them.

Three-quarters of citizens feel that the City of Linz should definitely promote a climate-friendly lifestyle. Almost 85 % of respondents want Linz to become climate neutral by 2040. Almost 82 % state that Linz should adhere to an upper limit with its own greenhouse gas emission and that climate change mitigation measures must always be socially just (see Figures 17 and 18). For an equally high percentage, the most important goal of all climate change mitigation measures is to ensure that industrial enterprises become climate neutral. Almost 85 % of respondents feel that the City of Linz should actively support companies that take particularly ambitious steps towards climate change mitigation.

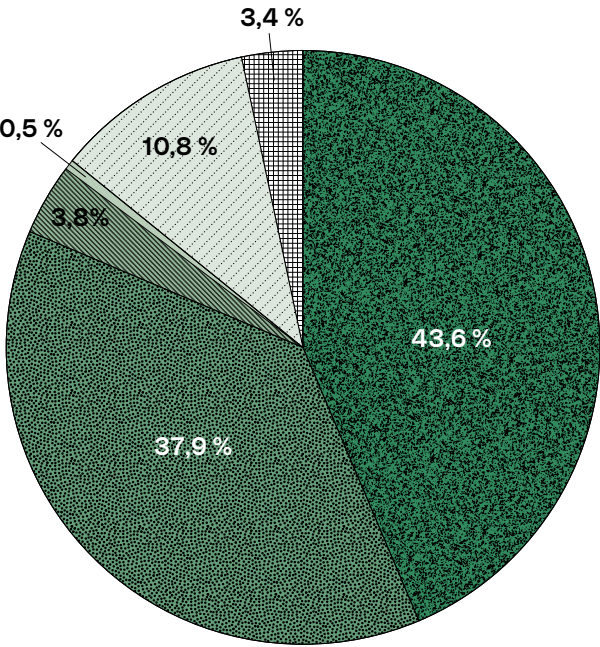
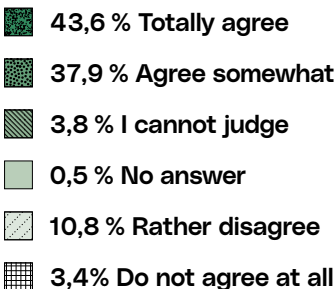
The City of Linz should set an upper limit for its own greenhouse gas emissions

Question: How much do you agree with this statement?



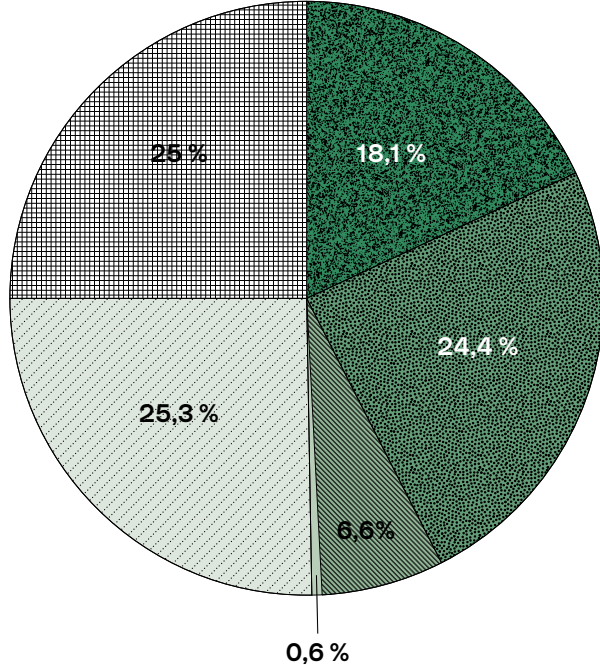
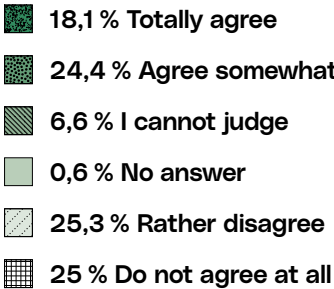
Climate mitigation measures must always be socially just.

Question: How much do you agree with this statement?



Vegan nutrition needs to be promoted by the City of Linz through awareness-raising and at events.

Question: How much do you agree with this statement?



Climate neutrality survey 2023
Linz City Administration

↑ [Fig. 17] Survey result: Adhering to upper limit of GHG emission; source Stadtforschung

↑ [Fig. 18] Survey result: socially just climate change mitigation; source: Stadtforschung

↑ [Fig. 19] Survey result: vegan nutrition; source: Stadtforschung

Of the respondents, 94 % believed that the waste heat from industry in Linz should be used to supply Linz homes with heating. Almost as many are in favour of simplifying self-sufficiency through renewable energy communities. The respondents are not quite as unanimous in generating electricity from photovoltaics. If this is to be generated on already sealed surfaces, 91 % are (quite) in favour. Should agricultural areas be used for this, however, 41 % of surveyed Linz residents were (rather) against this.

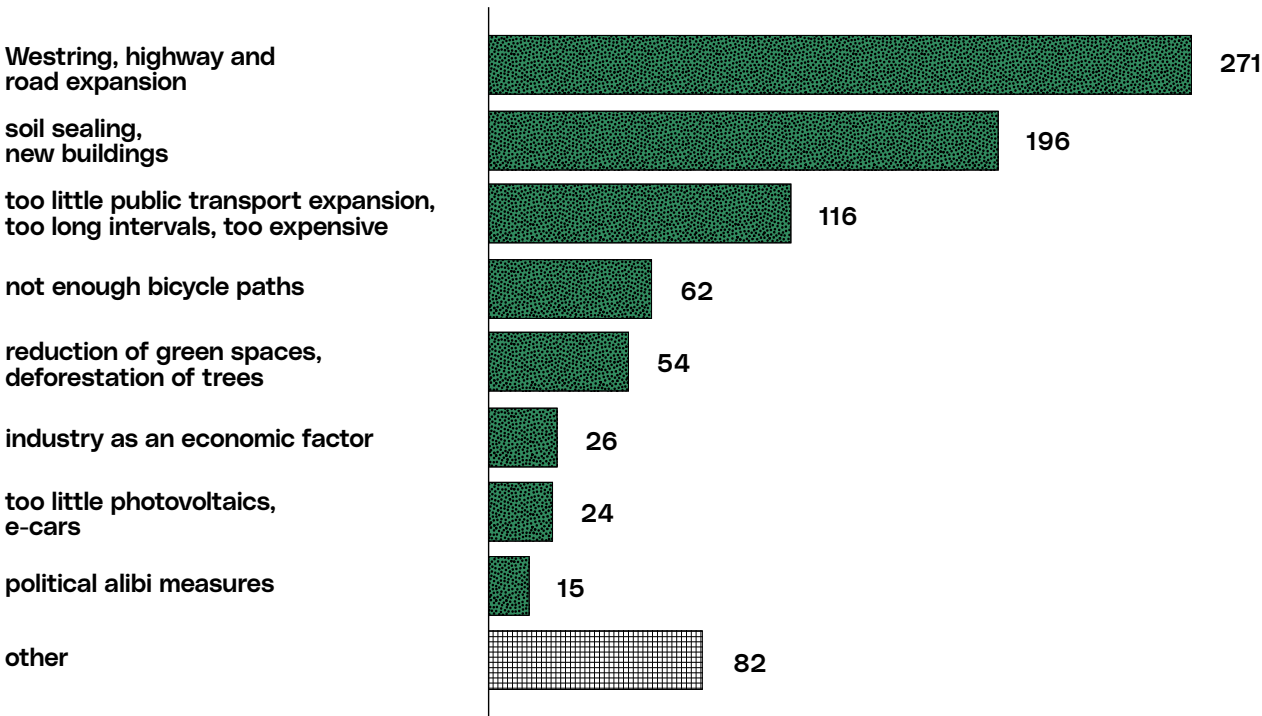
About two-thirds of participants who mainly travel by car in the Linz urban area could at least envision themselves transitioning to soft mobility if affordable, simple, and reliable offers exist. Three-quarters of those surveyed are in favour of the expansion of public transport (barrier-free mobility assistance in public transport) in the Linz urban area while at the same time restricting motorised private transport.

More than 9 out of 10 believe that built-up areas should be exploited first before any more land is sealed. Of the participants, 87 % favour ensuring that all new buildings are supplied with renewable energy before construction begins. Furthermore, a large majority (84 %) would like to see the greening of facades and more public funds to renovate residential buildings.

The topic of vegan nutrition was viewed more critically by the participants. Here, 43 % are (quite) in favour of the City of Linz promoting vegan nutrition through awareness-raising and at events, around half are (rather) against it (see Figure 19). When asked which City projects are incompatible with the vision of a climate neutral industrial city in 2040, Linz residents said that these are mainly the construction of the Westring and new roads or highways in the Linz urban area, as well as soil sealing (see Figure 20).

Climate neutral industrial city 2040

Question: In your opinion, are there any projects of the City of Linz that are not compatible with the vision of a climate neutral industrial city in 2040?



Climate neutrality survey 2023
Linz City Administration

Answers

Citizen panel in cooperation with UniNEtZ

Following the survey, the respondents could register to take part in an information evening and a two-day workshop to enable them to participate in developing the concept as part of a citizens' panel with climate experts from UniNEtZ. A total of 224 survey participants showed an interest in this.

Due to the selected methodology which was aimed at discussing climate change mitigation measures in an all-encompassing way, a smaller group of 30 persons was selected for the citizen panel. In the sample, an attempt was made to depict the socio-demographic conditions of the City of Linz. Together with UniNEtZ and a process facilitator, the Dynamic Facilitation method was implemented over the course of two days. This moderation method allows a small group to develop transformative climate change mitigation solutions through creative and open communication.

At the information evening on 10 October 2023, several climate experts were invited to make short presentations about climate change, urban climate in Linz, and a socially just climate policy for Linz, and to discuss these with citizens in table-group discussions. This event was necessary to create a common understanding. At the subsequent citizen panels on 21 and 22 October 2023, about 10 persons worked intensively on this issue: *How can we live climate-friendly and well in Linz?* (see Figure 21). To this end, various ideas for all activity areas of the climate neutrality concept were developed. The citizens' suggestions for climate change mitigation measures in Linz can be found in the measures catalogue.

After the citizen panel, a reflection workshop was held on 13 November 2023. The citizens had the opportunity to present the climate change mitigation measures they had drafted to administrative staff and scientists from the UniNEtZ project, exchange ideas, and give feedback on the panel process.

Due to the great interest in participating in the development process of the climate neutrality concept, the remaining 200 citizens who could not participate in the panel were invited to an evening event on 17 November 2023. Around 50 persons accepted this invitation (see Figure 22). Here, the first results of the survey were presented, and participants were asked to evaluate already existing measures for the climate neutrality concept in a "living library" setting and discuss these with the experts. The aim was to shed light on the social aspects of climate change mitigation. Citizens were given role cards with which they were asked to put themselves in the shoes of persons who may have different needs. From this, a total of eight draft measures about the activity areas of buildings, energy, mobility / traffic, consumption and industry were developed.

Selected quotes from citizens:

“I am concerned that the implementation of climate targets will widen the gap between disadvantaged population groups even further.”

“I do not want to have the results of this participation disappear into a drawer. It must lead to implementation.”

“We need more democratic involvement of the population.”



↑ [Fig. 21] Citizen panel in October 2023 with UniNetZ; source: Stadt Linz, WIKE
 ↑ [Fig. 22] Citizens at the additional event in November 2023; source: Stadt Linz, WIKE

List of references

Archiv der Stadt Linz. (2007). Linz zwischen Wieder-
 aufbau und Neuorientierung 1945–1984. ISBN 978-3-
 900388-89-8

Der Standard. (2013). Frische Brise statt dicker Luft
 in der Stahlstadt Linz. URL: [https://www.derstandard.
 at/story/1369362277034/frische-brise-statt-dick-
 er-luft-in-der-stahlstadt-linz](https://www.derstandard.at/story/1369362277034/frische-brise-statt-dick-er-luft-in-der-stahlstadt-linz), zuletzt abgerufen am
 21.07.2023, 14:48

Der Standard. (2023). In der Klimapolitik gibt es nicht
 die eine Lösung. URL: [https://www.derstandard.at/
 story/3000000193992/in-der-klimapolitik-gibt-
 es-nicht-die-eine-l246sung](https://www.derstandard.at/story/3000000193992/in-der-klimapolitik-gibt-es-nicht-die-eine-l246sung), zuletzt abgerufen am
 09.11.2023, 13:29

ISO. (2023). IWA 42:2022. URL: [https://www.iso.org/
 obp/ui/#iso:std:iso:iwa:42:ed-1:v1:en](https://www.iso.org/obp/ui/#iso:std:iso:iwa:42:ed-1:v1:en), zuletzt abge-
 rufen am 23.10.2023, 16:33

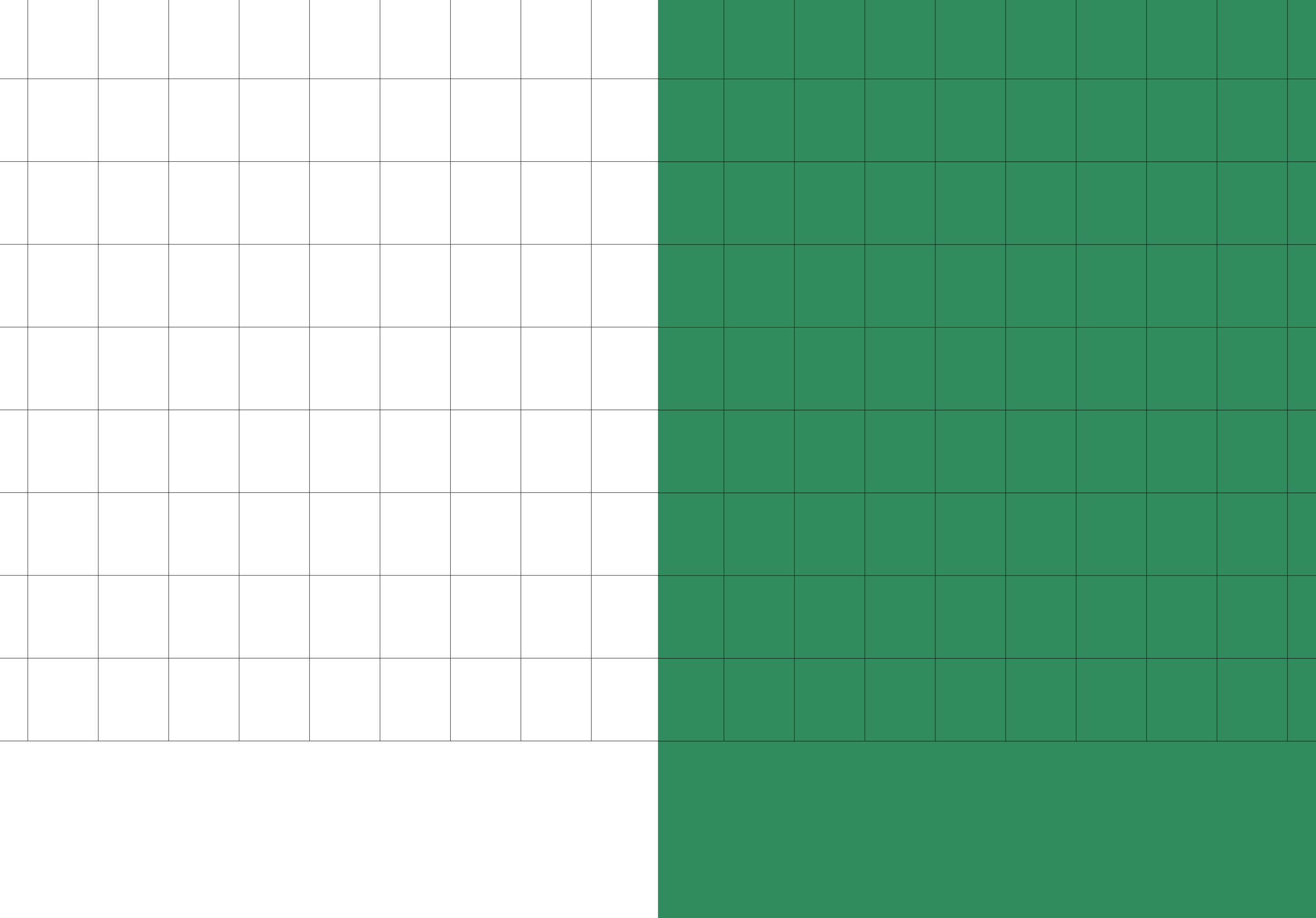
Jost, F., Dale, A., Newell, R., & Robinson, J. (2020). Eval-
 uating development path changes using a novel climate
 action assessment framework in three municipalities
 in British Columbia, Canada. Environmental Science
 & Policy, 114, 410–421. [https://doi.org/10.1016/j.
 envsci.2020.09.007](https://doi.org/10.1016/j.envsci.2020.09.007)

LINZ AG. (s.a.). Gestern Heute Morgen. URL: [https://
 www.linzag.at/media/dokumente/infomaterial_2/
 linzag-geschichte-gestern-heute-morgen.pdf](https://www.linzag.at/media/dokumente/infomaterial_2/linzag-geschichte-gestern-heute-morgen.pdf), zuletzt
 abgerufen am 18.07.2023, 12:25

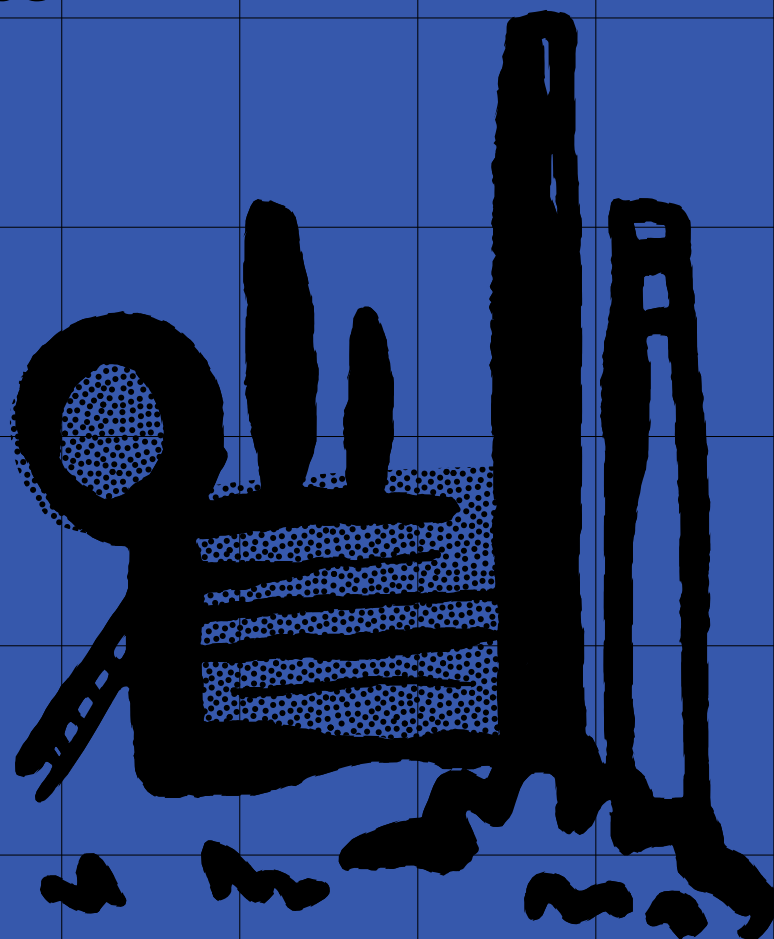
Morrison, T.H., Adger, W.N., Agrawal, A., Brown, K.,
 Hornsey, M. J., Hughes, T. P., ... & Van Berkel D. (2022).
 Radical interventions for climate-impacted systems.
 Nature Climate Change, 12, 1100-1106. [https://doi.
 org/10.1038/s41558-022-01542-y](https://doi.org/10.1038/s41558-022-01542-y)

Wilfinger, P., Nabernegg, S., & Steininger, K. (2022).
 Der Klimaschutzfonds der Stadt Graz: Einordnung
 und Überblicks-Bewertung der geförderten Projekte.
 Wegener Center Verlag. URL; [https://wegcloud.
 uni-graz.at/s/RkT7HpqFySEP4s6](https://wegcloud.uni-graz.at/s/RkT7HpqFySEP4s6), zuletzt abgerufen
 am 14.12.2023, 16:15

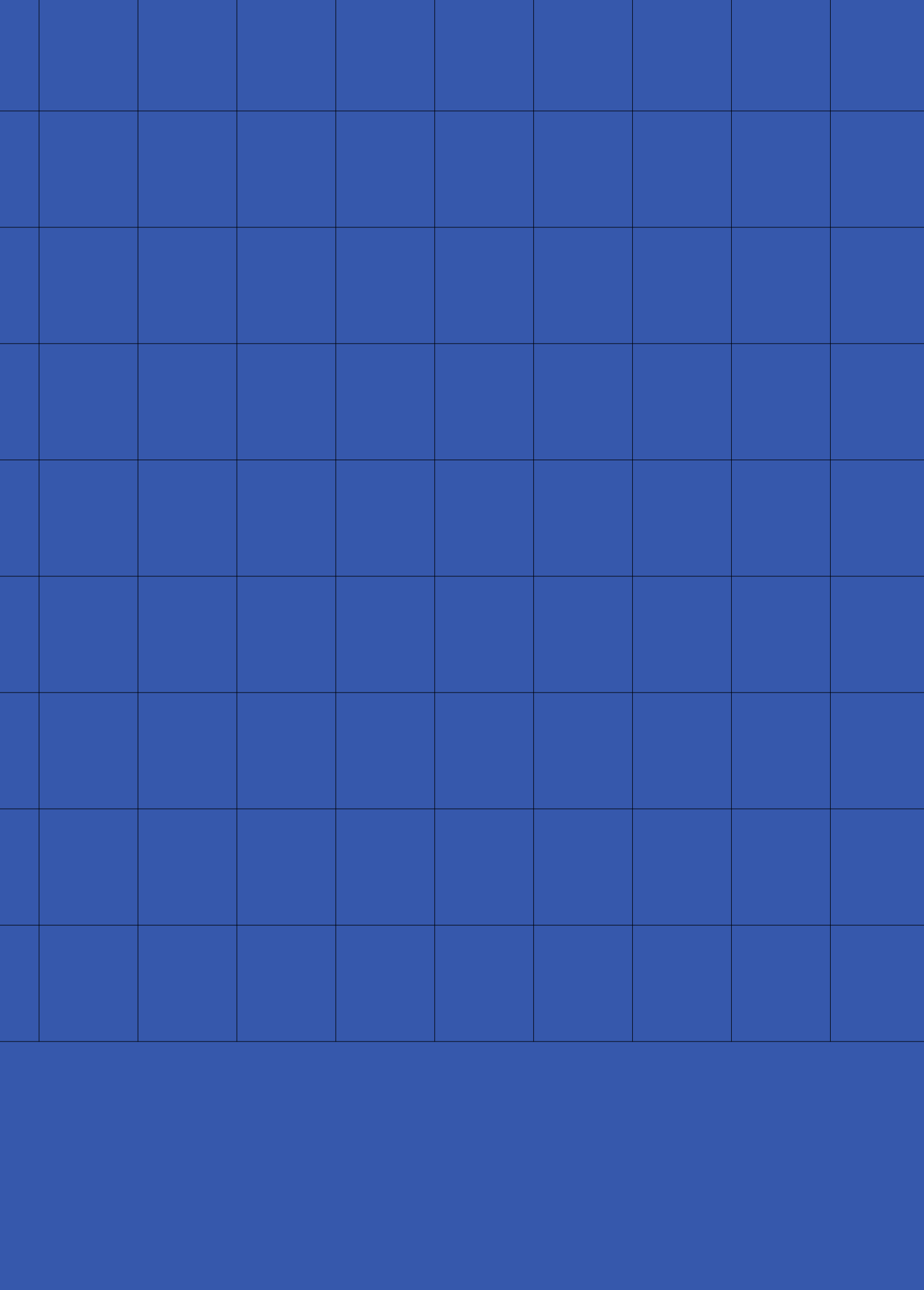
Wissenschaftlicher Beirat der Bundesregierung
 Globale Umweltveränderung. (2011): Hauptgutachten
 – Welt im Wandel Gesellschaftsvertrag für eine Große
 Transformation. URL: [https://www.wbgu.de/fileadmin/
 user_upload/wbgu/publikationen/hauptgutachten/
 hg2011/pdf/wbgu_jg2011.pdf](https://www.wbgu.de/fileadmin/user_upload/wbgu/publikationen/hauptgutachten/hg2011/pdf/wbgu_jg2011.pdf), zuletzt abgerufen am
 14.12.2023, 16:16



03	Greenhouse gas inventory of the City of Linz
11	Greenhouse gas budget of the City of Linz and greenhouse gas monitoring
16	List of references



04



Greenhouse gas inventory of the City of Linz

The City of Linz has a city-wide greenhouse gas inventory with the selected base year 2019. This city-wide GHG inventory forms the central starting point for making visible the biggest sources of GHG emissions and for the numerous climate change mitigation measures necessary to achieve the climate neutrality targets by 2040.

Base year or reference year

The base year 2019 is largely free from the “lockdown effect”, in other words, from the decreases of GHG emissions, which were not the result of ambitious climate change mitigation but measures to contain the COVID-19 pandemic. In addition, 2019 is representative of the City of Linz’s GHG emissions over the last 20 years. The year 2019 was also defined as a sound starting point for the urban GHG budget until 2040 due to the availability and quality of the urban GHG emission data.

The city-wide GHG emission inventory is made up as follows:

- Production-based GHG inventory of the City of Linz (e.g. industrial production processes in the city area, heating provision, urban road traffic, etc.)
- End-user or consumption-based GHG inventory of the City of Linz (e.g. end-user demand by private and public households for consumer goods such as electrical appliances and food stuffs which are largely produced outside of the city, corporate investments, etc.)

Composition of the city-wide GHG inventory

The GHG emissions for the entire city were identified in two significant sub-inventories for 2019. The Linz City Government can affect both sub-inventories differently with climate change mitigation measures (see Figure 23).

In addition to these two sub-inventories, a third, production-side GHG inventory was calculated for the Linz City Administration and the City of Linz Corporate Group. Although this is already included in the first partial inventory, the production-side GHG inventory of the City of Linz, it was explicitly made visible for municipal decision-makers to make it easier to plan targeted climate change mitigation for Linz City Administration and UGL operations. It has been impossible to present or calculate a final consumption or consumption-based analysis for the Linz City Administration, including the Corporate Group of the City of Linz, alone. However, the City of Linz’s procurement emissions are generally included in the overarching final consumption or consumption-based GHG inventory of the City of Linz.

Data availability, -quality, and methodology of the GHG inventory

The data for drafting the city-wide GHG inventory for Linz are taken from the Energie- und Emission-skataster Datenmanagementsystem (EMIKAT) (energy and emissions cadastre data management system) for the State of Upper Austria, consumer surveys of Statistics Austria, City surveys, and commissioned research. In general, GHG data were used to account for CO₂ as well as other important greenhouse gases, such as methane (CH₄) or nitrous oxide (N₂O), as far as possible. In addition, partial scientific estimates were made for missing data by the Wegener Centre of the University of Graz (see Figure 24).

In the production-side sub-inventory, emissions were accounted for based on the Greenhouse Gas Protocol (GHG-Protocol) BASIC and partially on BASIC+ reporting, developed by several international institutes and consortia (e.g. World Resources Institute, C40 Cities or ICLEI – Local Governments for Sustainability) as non-binding standard for capturing and reporting GHG emissions at the municipal level. The GHG Protocol provides guidance for the accounting of individual emission ranges as well as for general aspects such as the definition of the system boundary of the GHG inventory. In principle, it follows a production-based

principle, for which the production-based activities within the urban area are considered and evaluated with emission coefficients, regardless of whether the produced goods and services are finally used in the urban area. However, not only were direct emissions within the urban area (scope 1) taken into account for the greenhouse gas inventory, but, according to the GHG Protocol, upstream emissions (scope 2 and 3) of these production processes were also taken into account. This is especially meaningful for municipal observation, as electricity and district heating GHG emissions can otherwise only be captured if they are generated by power stations directly situated in the city area. Furthermore, operational emissions and upstream GHG emissions from traffic, e.g., from vehicle manufacturing for the municipal vehicle fleet, are considered.

In contrast, the second, consumption-based sub-inventory considers the end-user demand of private households, the public sector, and the corporate sector in Linz and includes all upstream (Scope 1–3) GHG emissions, regardless of the location of the GHG emissions. GHG emissions for products and services produced in Linz but subsequently exported are

Sector	Emission category			Data quality	
	Scope 1	Scope 2	Scope 3	Activity	Emission factor
Stationary energy					
Residential buildings	yes	yes	partly	●	●
Commercial and institutional buildings and facilities	✓	✓	×	○	?
Manufacturing industries and construction	✓	✓	×	●	?
Energy generation	✓	✓	×	●	?
Transportation					
On-road	yes	yes	no	●	●
Waterborne navigation	✓	✓	×	●	?
Aviation	✓	✓	✓	○	?
Waste / Waste water					
Disposal of solid waste	yes	–	yes	●	●
Biological treatment of waste	✓	–	✓	●	●
Incineration and open burning	✓	–	✓	●	●
Wastewater	✓	–	✓	●	●
Industrial processes and product use (IPPU)					
	yes	–	–	●	●
Agriculture, forestry, and land use (AFOLU)					
	yes	–	–	○	?

Sources required for BASIC reporting

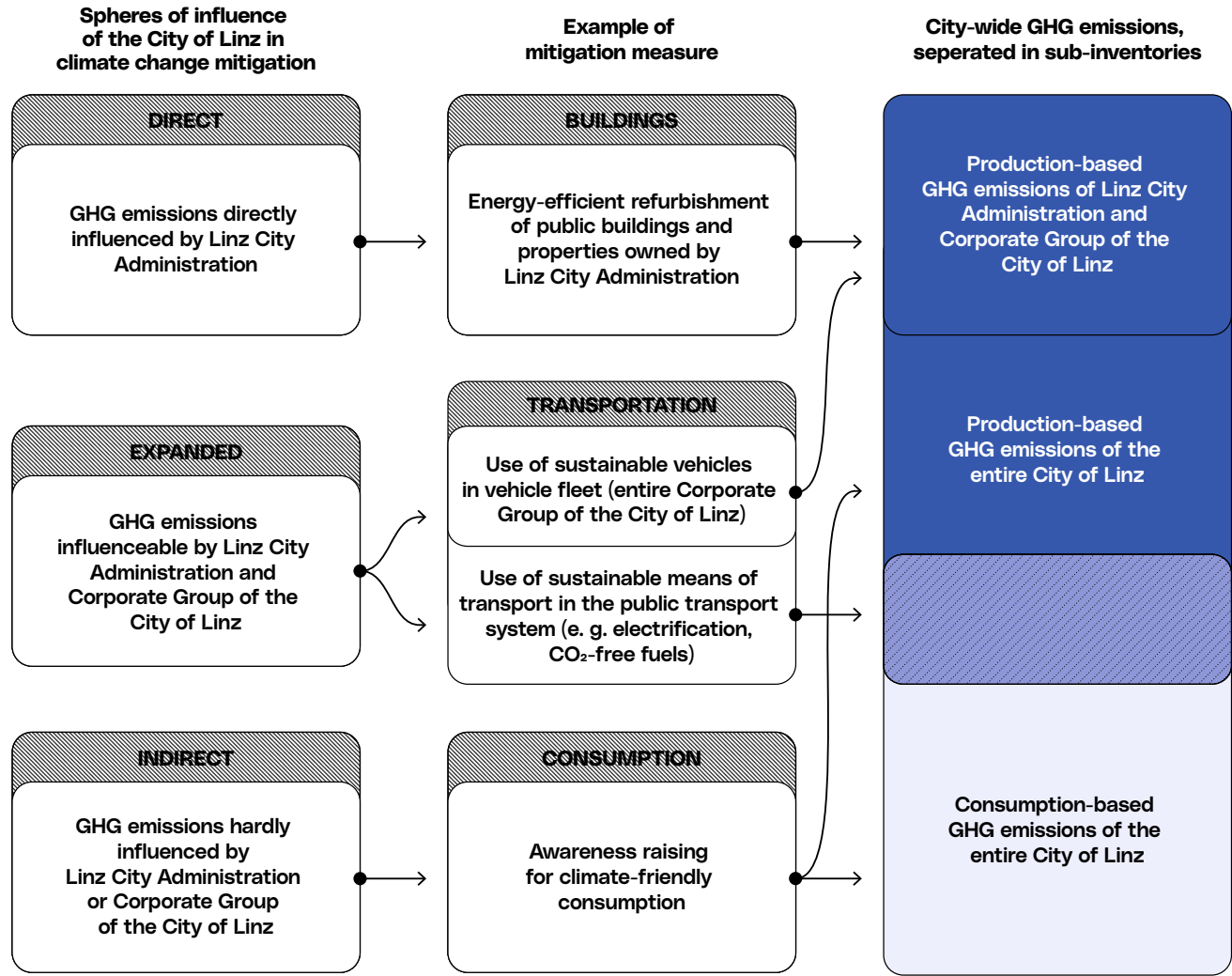
Sources required for BASIC+ reporting

non-applicable emissions

low

middle

high



therefore not considered in the consumption-based inventory. However, GHG emissions contained in imports (implicit, or also called “grey” emissions) are included in the calculation. The methodology for calculating the consumption-based GHG inventory consists of two parts. Firstly, the consumption of private households was taken into account based on the 2019/20 consumer survey by Statistics Austria and the Austria-wide demand from the public sector, and corporate investment was broken down to the City of Linz based on the population share. The emission intensity of these end-user demand sectors is calculated based on a multiregional input-output calculation and further regional data for Austria and Linz. These include CO₂ as well as other greenhouse gases based on the United Nations Framework Convention on Climate Change (UNFCCC). Using the consumption survey data of private households, it should also be noted that the most recent survey was carried out in the period 06/2019 to 06/2020 and partly fell into the measures to contain the COVID-19 pandemic. Although there were noticeable deviations in consumer behaviour in the surveyed households, only a quarter of the interviews were carried out during this period, according to Statistics Austria. From a scientific point of view, the lockdown effect can therefore be ignored.

It is difficult to draw boundaries between a production-based and a consumption-based sub-inventory. On the national level, an exact demarcation can be made between production-based and consumption-based GHG emissions. At the urban municipal level below this, a clear-cut demarcation is even more complex and not always generally comprehensible because the accounting is based on the GHG Protocol with Scope 1–3. However, talking about municipal spheres of influence in climate change mitigation is more important.

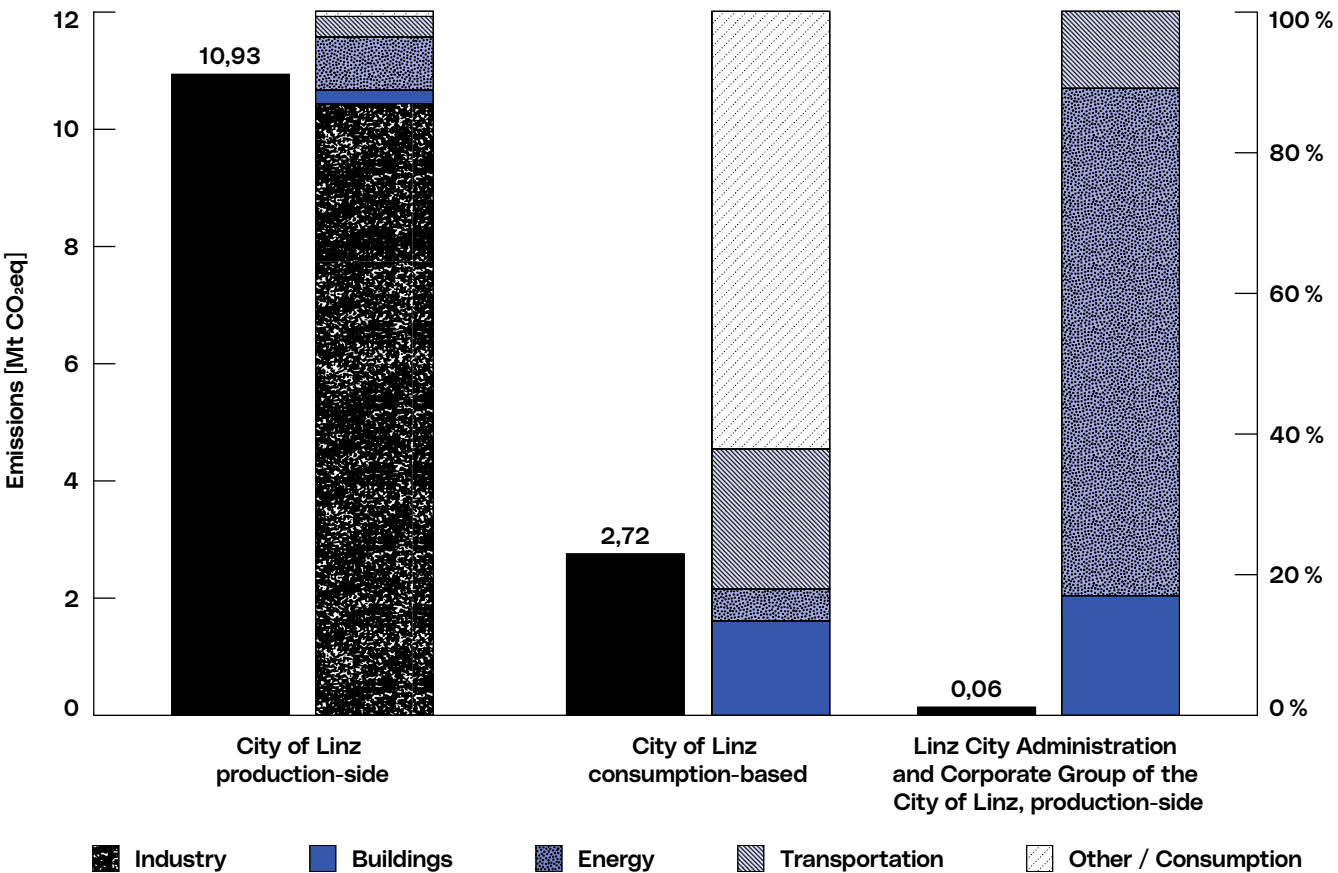
← [Fig. 23] Relationship between the spheres of influence, climate change mitigation measures, and the GHG sub-inventories (PEB = production-based GHG emissions); source: Nabernegg et al. (2024)

↑ [Fig. 24] Availability and quality of municipal GHG data (production-based); source: Nabernegg et al. (2024)

Overall view and structure of city-wide GHG-emissions

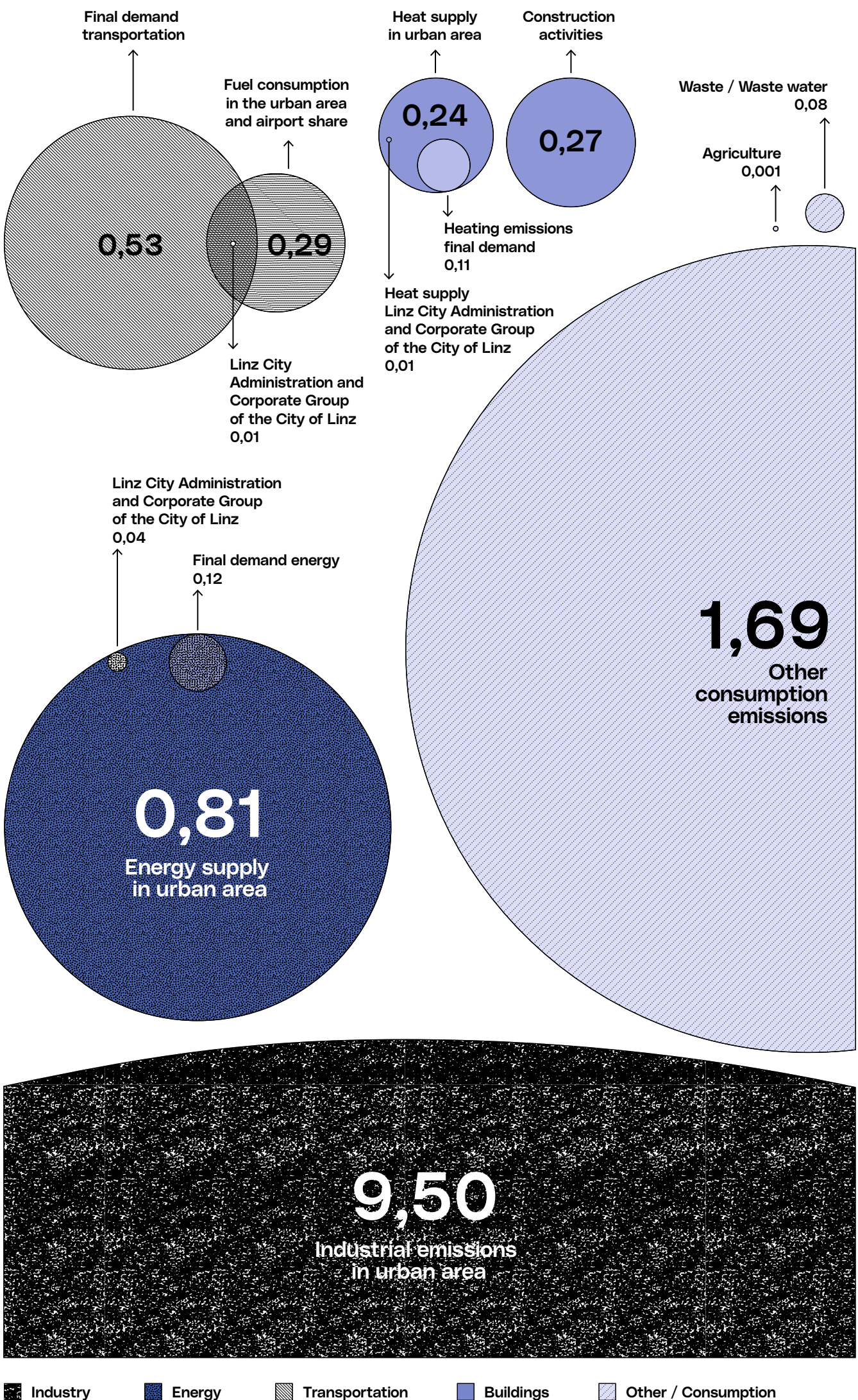
In terms of absolute GHG emissions, Linz shows a special pattern compared to other Austrian cities. Overall, the production-based GHG emissions of the City of Linz exceed the consumption-based GHG inventory fourfold due to the steel industry located in the municipal area (see Figure 25). Production-based GHG emissions in 2019 amounted to a total of 10.9 Mt CO₂eq. If the industrial emissions in the production-based inventory are not considered, the urban GHG emissions are about 1.4 Mt CO₂eq, just under 50 % below the consumption-based urban emissions. Struc-

turally, GHG emissions from the energy supply for electricity and heating account for the biggest share in the production-based sub-inventory at the municipal non-industrial level. The most relevant area of the 2.7 Mt CO₂eq of consumption-based GHG emissions in the City of Linz relates to grey / upstream emissions from general consumption. These grey / upstream GHG emissions alone amount to 1.69 Mt CO₂eq. Furthermore, traffic / transport to which the flight emissions from Hörsching airport must be added takes up a big share of consumption emissions (see Figure 26).



↑ [Fig. 25] City-wide GHG emissions of the City of Linz in the base year 2019; source: Nabernegg et al. (2024)

→ [Fig. 26] City-wide GHG emissions in Mt CO₂eq on detail in the base year 2019; source: Nabernegg et al. (2024)



Industry Energy Transportation Buildings Other / Consumption

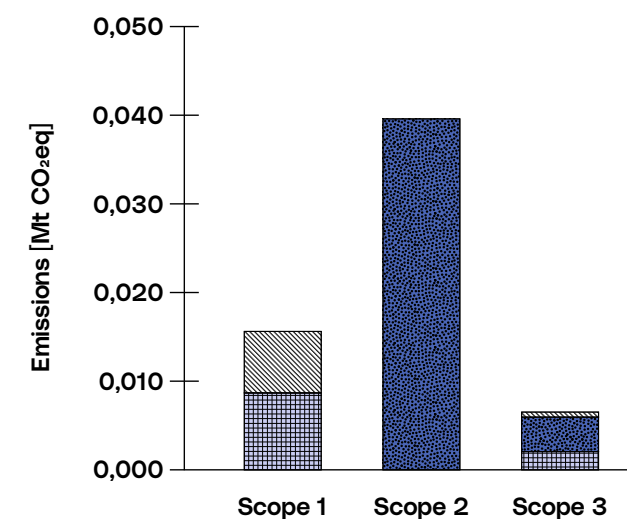
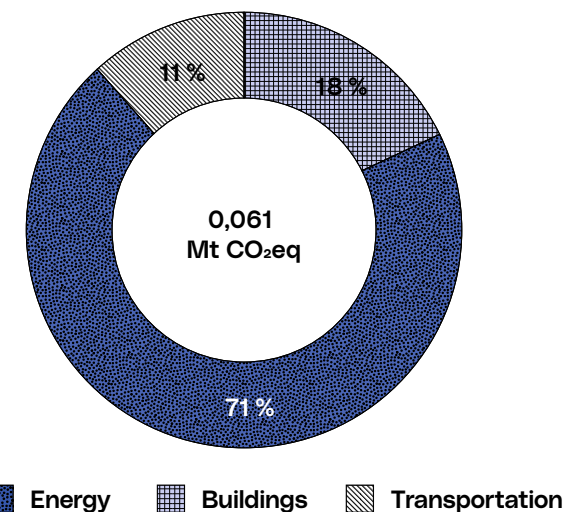
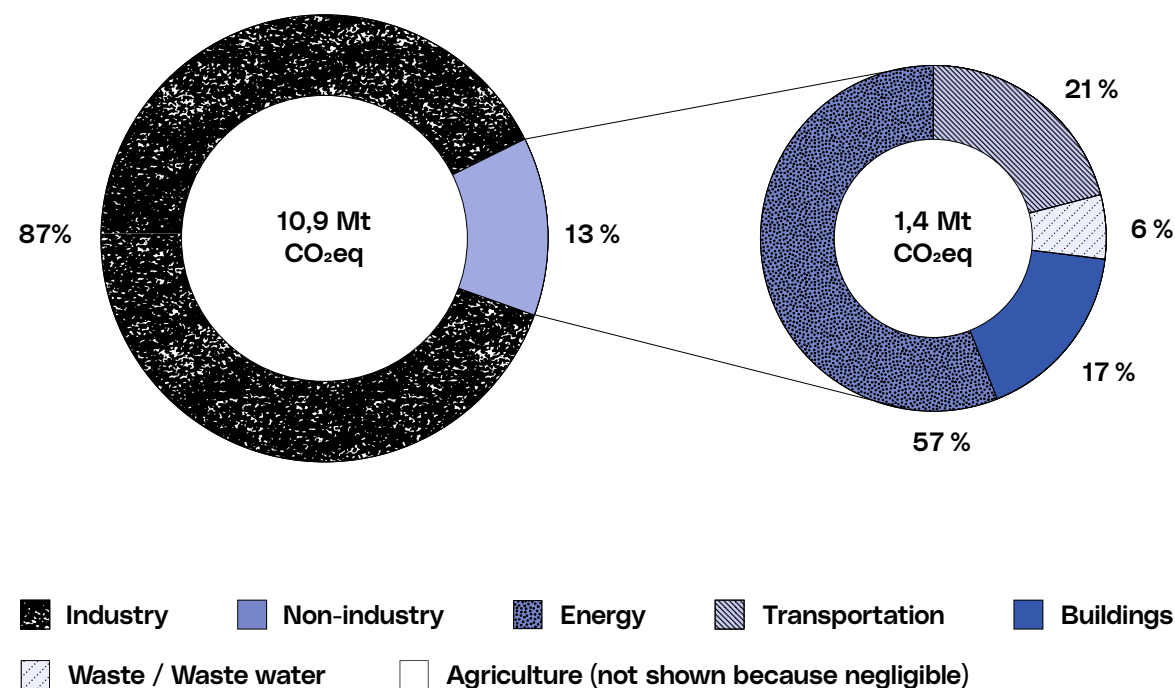
Comparison with the average per capita Austrian GHG emission

A comparison of the city's production-based GHG emissions per capita with the Austrian average again shows the relevance of industrial emissions for Linz. These are fivefold above the Austrian average (9.8 t CO₂eq per capita) with 52.8 t CO₂eq per capita. These differences are significantly reduced if one looks at production-based GHG emissions, excluding the industries. Nonetheless, the per capita GHG emission in Linz of 6.9 t CO₂eq per year is also slightly above the Austrian average, with about 40 % or 30 % of that of Vienna (4.3 t CO₂eq per capita per year) and that of Graz (5.0 t CO₂eq per capita per year). In the consumption-based observation, this regional difference is significantly smaller. Compared to the Austrian average, the emission value for Linz is slightly higher, with 13.2 t CO₂eq per capita and year. This can be attributed to the more emission-intensive consumer behaviour of private households. Comparisons between cities are, however, only useful to a limited extent, as no uniform calculation method was used to survey consumption emissions, which may result in differing regional values. Apart from that, climate transformation for all cities in Austria is associated with similar challenges and uncertainties, and to overcome these, cooperation, rather than rivalry, is needed. The aim of comparison between cities is the exchange of ideas and mutual learning concerning reduction measures and collaboration.

Production-side GHG inventory of the City of Linz / details

The production-side sub-inventory shows that the predominant proportion (87 %) of GHG emissions emitted in the Linz urban area originates from steel production and is produced by both stationary energy production and industrial production processes. The majority of industrial emissions are included in the EU Emissions Trading System and must, therefore, be addressed in terms of climate policy not only at an urban level but also at national and European levels. The sector "non-industry" (13 % of total emissions) emitted 1.4 Mt CO₂eq in the base year, with energy production (57 %) and transport / traffic (21 %) accounting for the largest share of emissions. Direct building emissions are responsible for 17 % of non-industrial GHG emissions. It should be noted that GHG emissions in the energy sector are largely caused by heat provision for buildings through district heating. GHG emissions from thermal waste production account for approx. 6 % (see Figure 27).

Structurally and compared to the cities of Vienna and Graz, it becomes apparent that the GHG emissions of Linz's energy sector take up a larger part, whereas building emissions show a slightly lower share of emissions. This is partly due to the relatively high proportion of Linz buildings connected to district heating supply (over 80,000 apartments), which means their heating emissions are accounted for in the energy sector.



Production-side GHG inventory of the Linz City Administration and the UGL: details

The GHG emissions of the Linz City Administration and the Corporate Group of the City of Linz are produced by the City Administration's vehicle fleet, the energy supply for buildings (directly through gas heating and indirectly through district heating and electricity supply), as well as the use of fuel for public transport. GHG emissions from waste and wastewater streams were assumed negligible (degassing plants are available, and landfill gas volumes are declining). Emissions from the vehicle fleet of the Corporate Group of the City of Linz have not been included due to incomplete data. For the base year 2019, the production-side GHG emissions from the City Government and the Corporate Group of the City of Linz amount to 0.061 CO₂eq (see Figure 28). Because, as described, not all sources of GHG emissions and only a proportion of the companies in the Corporate Group of the City of Linz could be included, it must be assumed that total emissions in an all-encompassing survey for the Linz City Administration and the Corporate Group of the City of Linz would be higher.

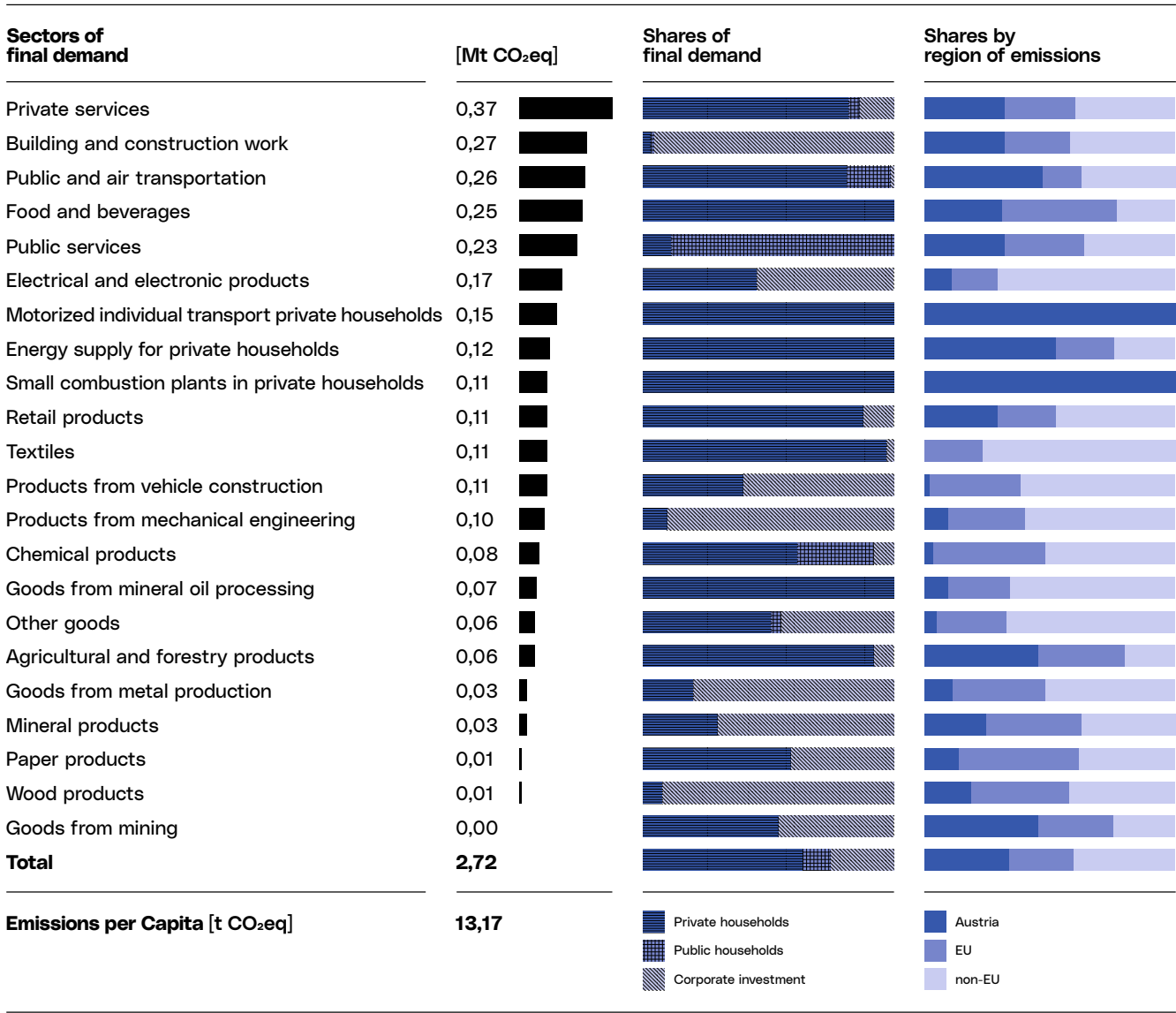
Consumption- or end-user-based GHG inventory of the City of Linz: details

In contrast to production-based GHG emissions related to the GHG emission from production activities within the Linz urban area, GHG emissions originating along upstream supply chains due to municipal end-user demand are added to the consumption-based sub-inventory of the City of Linz. This end-user demand includes the consumption of all private households and the public sector as well as the investment demand from companies in Linz. It must be noted that consumption-based emissions vary greatly between persons or households. In Austria, for example, it is evident that around four times the emissions can be allocated to the 10 % of the population with the highest income compared to the 10 % of the population with the lowest income. The same unequal distribution can be assumed in the City of Linz. Demand from private households causes two-thirds of the total consumption-based GHG emissions in the City of Linz. Around a quarter of consumption-based GHG emissions are caused by the investment demand of companies, and 11 % by demand from the public sector (see Figure 29).

Looking at the regions of origin of consumption emissions triggered by demand in Linz, they show that a third are generated in Austria while a quarter are generated in the rest of the EU. The largest share (40 %) originates from countries outside the EU. With regard to different sectors, it is evident that mainly private and public services (13 % and 8 % respectively) and building and construction work (10 %) account for

← [Fig. 27] Production-side GHG sub-inventory of the City of Linz in the base year 2019; possible rounding errors; source: Nabernegg et al. (2024)

↑ [Fig. 28] Production-side GHG sub-inventory of the Linz City Administration and the UGL in the base year 2019; source: Nabernegg et al. (2024)



a high share of city-wide consumption-based emissions. Furthermore, public transport and air travel take up a relatively big share of a further 10 %. Public transport and air travel were depicted together due to methodological reasons. It must be noted that the transition to public transport, as opposed to emission-intensive air travel powered by fossil fuels, is one of the most effective climate change mitigation measures. The energy supply for private households (6 %), direct GHG emissions from households through motorised private transport, and heating systems (4 % each) also represent a relevant share. GHG emissions in agriculture can be attributed both to direct end-user demand for agricultural and forestry products (2 %) and to end-user demand in the food sector (9 %) through, amongst others, upstream supply chains.

Broken down by individual sectors, the composition of the consumption-based GHG emissions of households in Linz is as follows: Buildings 0.38 Mt CO₂ eq, traffic 0.53 Mt CO₂eq, foodstuffs 0.25 Mt CO₂eq, electricity and district heating 0.12 Mt CO₂eq, consumer goods 0.85 Mt CO₂eq, and services 0.59 Mt CO₂eq.

↑ [Fig. 29] Consumption-side of the GHG sub-inventory of the City of Linz in the base year 2019; source: Nabernegg et al. (2024)

Greenhouse gas budget of the City of Linz and greenhouse gas monitoring

The emission of CO₂ and other greenhouse gases due to human activity has an almost linear effect on the increase in global warming. It is, therefore, scientifically possible to calculate the global amount of GHG emissions that is still available to mitigate the global climate crisis. The IPCC published the remaining available GHG budget at a global level in the last Assessment Report and defined the physical upper limit of GHG emissions that may still be emitted into the atmosphere in order not to exceed the +1.5 °C limit with a certain probability by the end of the century.

Methodology for the drafting of the GHG inventory

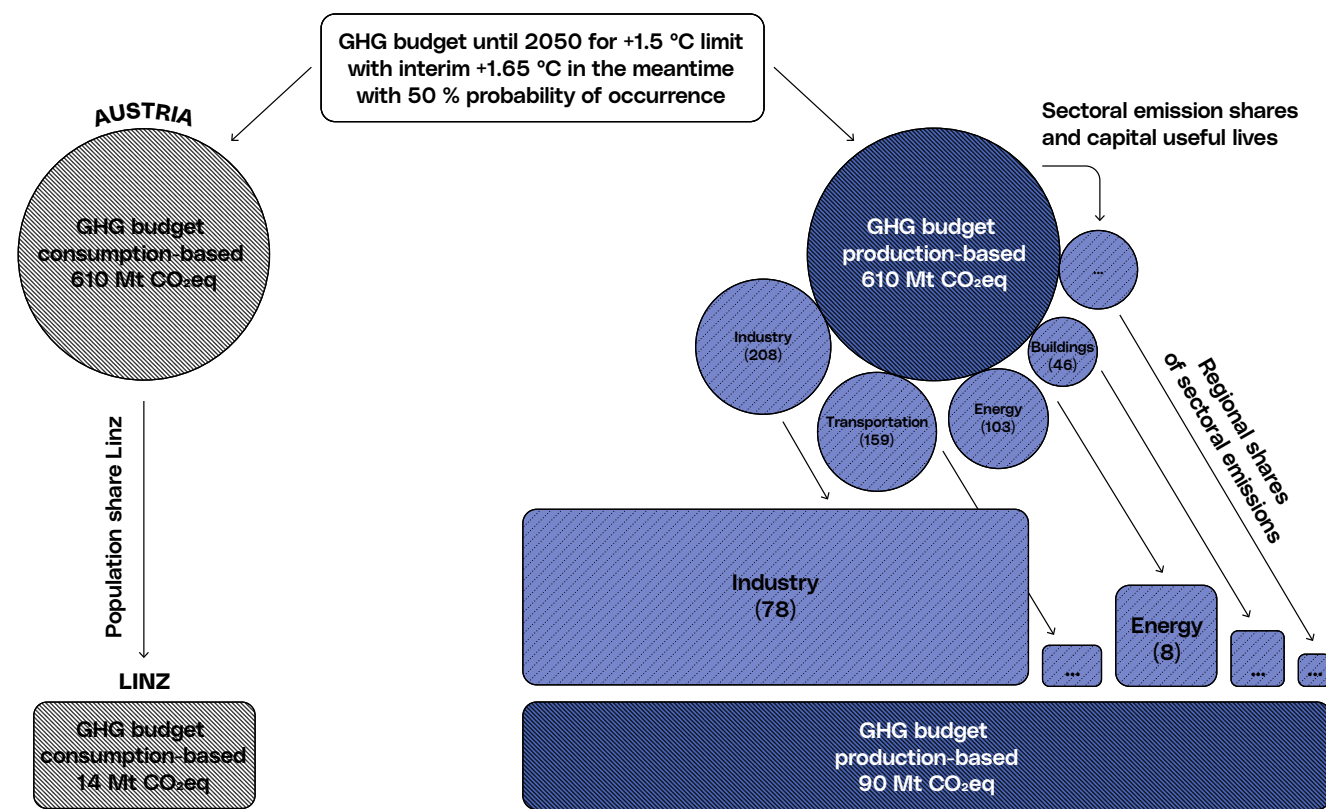
The global GHG budget can be allocated to countries based on fairness considerations. Using a standardised per capita approach, the scientific community determined the remaining national GHG budget for Austria. Depending on the greenhouse gases taken into account, the probability of achieving the target and with or without exceeding the +1.5 °C limit in the meantime (temperature overshoot) results in a national GHG budget of 240 to 610 Mt CO₂eq. If annual GHG emissions remained constant, a national GHG budget of this kind would already be fully utilised between 2025 and 2030. However, if natural greenhouse sinks (forests, the soil) are improved over the long term, an extension of the GHG budget by the corresponding emissions commitment is generally permissible (note: this possibility does not replace rapid and ambitious measures for emission reduction in all sectors). In the climate neutrality concept, the national GHG budget was broken down for the City of Linz and other sectors by the Wegener Center for Climate and Global Change of the University of Graz.

The GHG budget determined for the City of Linz was derived from the still permissible GHG budget globally and is consistent with the two sub-inventories (production-side, consumption-side GHG accounting) and takes into account the different economic

structures at a regional level. For Linz, a production-based GHG budget (i.e. for consumption through production-based, balanced GHG emissions) and a consumption-based GHG budget (i.e. for consumption through consumption-based, balanced GHG emissions) were derived analogously for accounting purposes.

City-wide GHG budget of the City of Linz until 2040

In line with the “equal-per-capita” approach, in which each person is allocated the same emission rights, the Austrian GHG budget was scaled for Linz based on the population share of 2.3 %. This results in a consumption-based GHG budget for the City of Linz of 14 Mt CO₂eq for compliance with the +1.5 °C limit at 50 % probability by the end of the century and temperature overshoot in the interim. The production-based GHG budget for Linz was derived by allocating the national GHG budget to the economic sectors of the Federal Climate Change Act (KSG). For Linz, using the city’s sectoral share of Austrian GHG emissions results in the respective production-based GHG budget, which totals around 90 Mt CO₂eq by 2050 (see Figure 30). At a national level, the emission or binding of urban GHG emissions in natural carbon sinks is to be added or subtracted from Linz’s GHG budget. Ambitious climate change mitigation measures are indispensable to adhere to the urban GHG budget.



Possible reduction pathways to meet the city's GHG budget

In order to become climate neutral by 2040 at the latest, the City's climate policy must not overutilise the remaining GHG available to the City of Linz. The design of the reduction pathway is largely determined by the speed and impact of the climate change mitigation measures implemented, even if the time of net zero is less relevant than the cumulative emissions emitted up to that point. Compliance with the city's GHG budget by 2040 depends very much on whether GHG emissions can be reduced to a sufficient extent in the next one to three years.

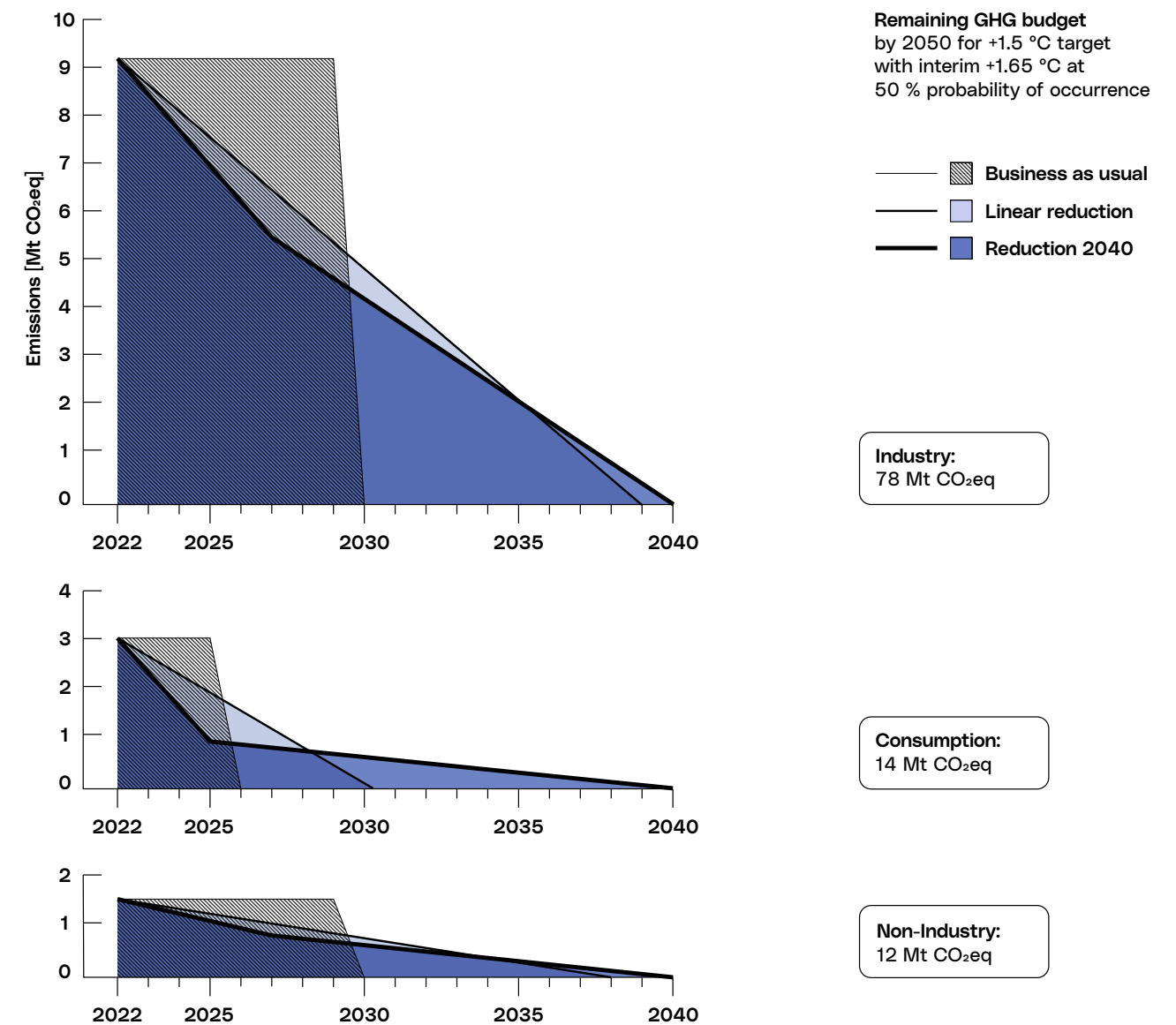
The possible reduction pathways to meet the City of Linz's GHG budget were illustrated in three variants: (i) for the production-based GHG emissions of Linz industry, (ii) production-based emissions excluding industry (non-industry); and (iii) the consumption- or end-user demand-oriented GHG emissions of the City of Linz. For the period from 2020 to 2022, which is not covered by the GHG inventory, constant GHG emissions were assumed, and therefore, the values from the selected base year 2019 were assumed.

According to a business-as-usual pathway, it is assumed that GHG emissions of the City will remain at the current level, meaning that the available GHG budget for industrial and non-industrial emissions, on the one hand, and for consumption-based emissions, on the other hand, will have been depleted by 2029 and 2025 respectively. After that, the city's GHG emissions would have to be reduced to zero and stay at that level.

A linear reduction pathway would provide for a consistent annual reduction of a specific amount of GHG. For the

industry, this would result in a carbon budget depletion year (meaning the year when the available GHG budget will have been used up) of 2038 for an annual reduction of -6.2 % of GHG emissions at the 2022 level. As far as the production-based GHG emissions excluding the industry (non-industrial emissions) are concerned, the results for a linear pathway are similar, with the carbon budget depletion year being reached in 2037 and an annual reduction of -6.3 % of 2022 GHG emissions. On the other hand, in a linear reduction pathway, the consumption-based GHG budget in Linz would be used up by 2031 already; consequently, in order to achieve net zero, it would need to be reduced by -12 % of 2022 emissions by then.

According to an ambitious reduction-2040 pathway, a reduction pathway is shown for each area that will only result in the depletion of the corresponding GHG budget by 2040. For this, a greater reduction compared to the linear reduction pathway has been assumed by 2025. For the industrial and non-industrial emissions of Linz, this would be achievable at a slightly higher annual reduction of -9.0 % or -9.3 %, respectively, of the corresponding emissions between 2022 and 2025. voestalpine AG plans to make its entire steel production CO₂ neutral by 2050 by converting to green hydrogen. By 2030, the existing blast furnace route is to be replaced in part by a hybrid electric furnace route; this is expected to reduce CO₂ emissions from steel production by one-third and is consistent with the 2040 reduction pathway illustrated below. As far as consumption-based emissions are concerned, however, GHG emissions in Linz would need to be reduced by -23.4 % by 2025 relative to 2022 GHG emissions to meet the net zero target (see Figure 31).



Approach to implementing a gradual city-wide GHG monitoring

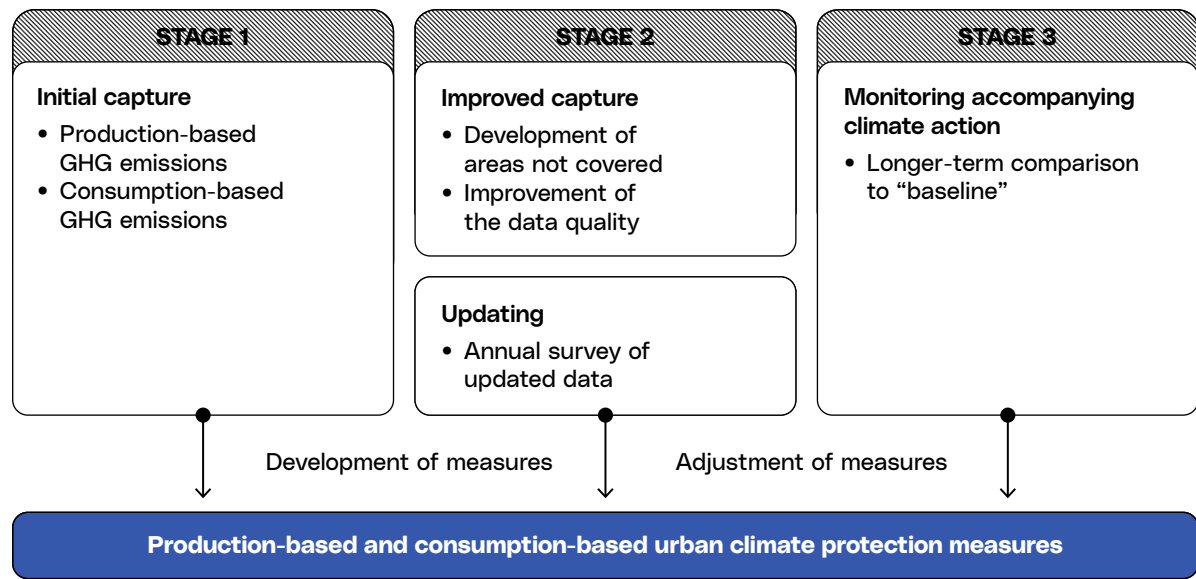
Meeting the city-wide GHG budget by 2040 will require more than just a mere commitment to climate transformation, but rather consistent and prompt implementation of drastic climate change mitigation measures on the part of the political decision-makers of the Linz City Government, the economic decision-makers and the citizens.

In order to assess the effectiveness of already implemented climate change mitigation measures (retrospective approach) and to obtain an overall overview of the reduction pathway, the Linz City Government should introduce city-wide greenhouse gas monitoring as soon as possible. Such a city-wide GHG monitoring should also include an impact assessment of climate change mitigation measures still to be implemented (prospective approach).

Greenhouse gas monitoring at the city-wide level may comprise various stages and should ideally be carried out annually (alternatively every two years) (refer to Figure 32). The first stage of the monitoring is covered by the initial stock-taking in the respective sub-inventories relative to the base year 2019, as presented in this document, which provides a sound baseline for the climate change mitigation measures listed in the concept. In the second stage, the corresponding sub-inventories will need to be refined. On the other hand, prompt updates will need to be carried out so that the progression of the total GHG emissions can be coordinated with implementing climate change mitigation measures in the coming years. In a parallel third stage, the implemented measures can be accompanied by GHG monitoring so that individual climate change mitigation measures' short- and long-term effectiveness can be assessed and, if necessary, adapted in isolation.

κ [Fig. 30] Calculation of the city-wide GHG budget of the City of Linz; source: Nabernegg et al. (2024)

↑ [Fig. 31] Possible reduction pathways in compliance with the derived production-based and consumption-based sector GHG budgets of the City of Linz, prorated until the target year 2040; source: Nabernegg et al. (2024)



↑ [Fig. 32] Proposal for a gradual GHG monitoring in the City of Linz by Wegener Center for Climate and Global Change at the University of Graz; source: Nabernegg et al. (2024)

Need for improvement and next steps

The establishment of a city-wide GHG monitoring system requires an improvement in the collection and management of greenhouse gas data at Linz City Administration and UGL, as well as the seamless exchange of this data for climate policy monitoring and control purposes.

The *KlimaStadtLinz2030* project identified the following areas of improvement:

- Comprehensive and homogenous acquisition of up-to-date and comprehensive greenhouse gas relevant data, e.g. in the form of a data management system
- Complete data exchange, including with UGL companies within the extended sphere of influence
- Use of a digital inventory tool (software tool) to facilitate the creation of (an) GHG inventory(ies) and appropriate monitoring and to support climate policy control
- Establishment of a monitoring department at the Linz City Administration

As a priority, the data quality of the production-based GHG sub-inventory (e.g. buildings and trade) should be increased in order to improve the control of climate change mitigation measures within the direct and indirect sphere of influence. Production-based GHG emission data should be acquired at frequent intervals, if possible.

The consumption-based sub-inventory could be improved by breaking down the private and public household demand data and investments made by companies. Data on the demand of private households in Linz were taken from the consumption survey of Statistics Austria, which is currently carried out every five years. In addition, owing to the sample size, the average demand of Austrian cities with a population of more than 100,000 inhabitants, excluding Vienna, was used. To better verify compliance with the reduction pathways by 2040, consumption- and end-user-demand-based data would need to be analysed at shorter intervals between one and two years based on specific demand data for Linz households. For the initial inventory, public household demand and investment demand of Linz companies were converted using a population key. Achieving a more informative GHG monitoring would require continuous analysis of the public household, on the one hand, and an empirical data basis of investments made by Linz companies, on the other hand.

In order to facilitate the city-wide GHG monitoring simultaneously with the implemented measures, indicators specific to the corresponding measures should be collected, such as, for example, the modal split, energy indicators, etc. The *GHG Protocol Policy and Action Standard* provides a robust framework for this purpose. Since the decision-making power for certain climate change mitigation measures lies with the Republic of Austria or the State of Upper Austria, coordination with these local authorities should be sought to ensure consistent reporting and improved comparability of GHG monitoring. Besides, the City of Linz should cooperate closely with other cities (Vienna, Graz, etc.), the Umweltbundesamt GmbH and Austrian climate research with respect to the technical aspects of GHG monitoring.

List of references

CCCA. (2022). +1,5 ° C: Wieviel Treibhausgase dürfen wir noch emittieren? Hintergrundpapier zu globalen und nationalen Treibhausgasbudgets. URL: https://www.ccca.ac.at/fileadmin/00_DokumenteHauptmenue/02_Klimawissen/Papiere/THG-Budget_Hintergrundpapier_CCCA.pdf, zuletzt abgerufen am 14.12.2023, 13:52

CCCA. (2022). CCCA Fact Sheet #40 / +1,5 °C: Wieviele Treibhausgase dürfen wir noch emittieren? URL: https://ccca.ac.at/fileadmin/00_DokumenteHauptmenue/02_Klimawissen/FactSheets/40_treibhausgas_budget_202212.pdf, zuletzt abgerufen am 01.11.2023, 10:32

Fong, W. K., Sotos, M., Schultz, S., Deng-Beck, C., Marques, A., & Doust, M. (2021). Global protocol for community-scale greenhouse gas emission inventories: Greenhouse gas protocol. Canadian Electronic Library. URL: <https://ghgprotocol.org/ghg-protocol-cities>, zuletzt abgerufen am 14.12.2023, 14:41

Nabernegg, S., Steininger, K. W., Wilfinger, P. & Hoff, H. (2024). Emissionsbilanz, THG-Budget und Emissionsmonitoring der Stadt Linz. Wegener Center Verlag, ISBN 978-3-9505053-2-0

Niemetz-Wahl, N., Horak, J. & Schrot, O. (2023). KlimaStadtLinz2030 – Der Weg von Linz zur Klimaneutralität bis 2030 – Vorbereitung auf die EU-Mission „100 Climate-neutral Cities by 2030“. Berichte aus Energie- und Umweltforschung 31/2023. URL: [KlimaStadtLinz2030 - Publizierbarer Ergebnisbericht \(nachhaltigwirtschaften.at\)](https://www.klimastadtlinz.at/publikationen/Ergebnisbericht-nachhaltigwirtschaften.at), zuletzt abgerufen am 01.02.2024

Rich, D., Bhatia, P., Finnegan, J., Levin, K., & Mitra, A. (2014). Greenhouse gas protocol: Policy and action standard. World Resources Institute.

Stadt Linz. (2022). Linzer Energieeffizienzprogramm – LEEP 2. Phase. Bericht. LEEP_2012_Phase_2.pdf (linz.at), zuletzt abgerufen am 05.02.2024, 13:43

Stadt Linz. (2023). Maßnahmen zur Energieeffizienz. URL: [Maßnahmen zur Energieeffizienz | Stadt Linz](https://www.stadtlinz.at/maassnahmen-energieeffizienz), zuletzt abgerufen am 05.02.2024, 13:35

Statistik Austria. (2021). Verbrauchsausgaben / Hauptergebnisse der Konsumerhebung. URL: https://www.statistik.at/fileadmin/publications/Verbrauchsausgaben_-_Hauptergebnisse_der_Konsumerhebung_2019_2020.pdf, zuletzt abgerufen am 09.11.2023, 14:15

Steininger, K. W., Meyer, L., Nabernegg, S., & Kirchengast, G. (2020). Sectoral carbon budgets as an evaluation framework for the built environment. Buildings and Cities, 1(1), 337–360. <https://doi.org/10.5334/bc.32>

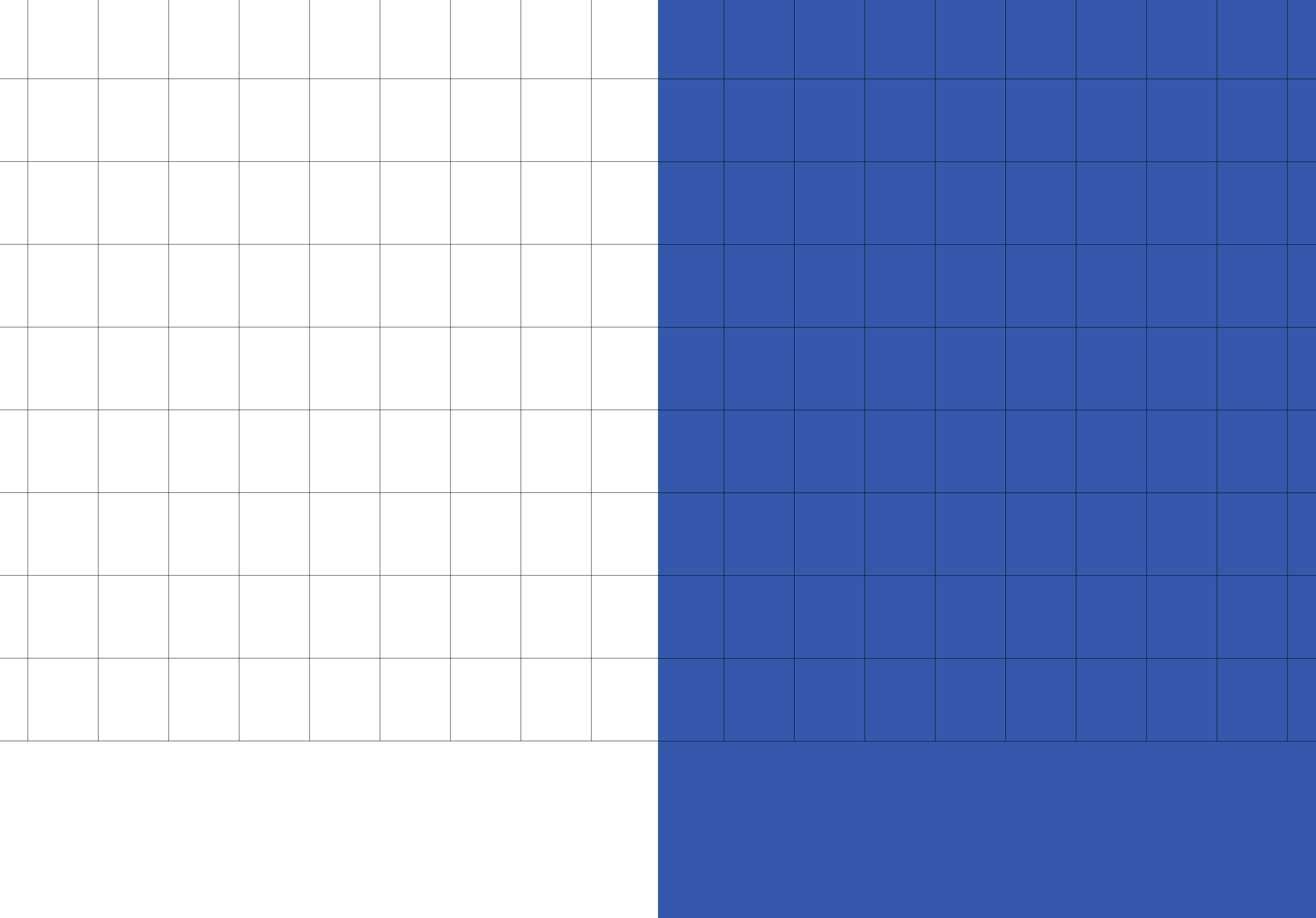
Steininger, K. W., Munoz, P., Karstensen, J., Peters, G. P., Strohmaier, R., & Velázquez, E. (2018). Austria's consumption-based greenhouse gas emissions:

Identifying sectoral sources and destinations. Global Environmental Change, 48, 226–242. <https://doi.org/10.1016/j.gloenvcha.2017.11.011>

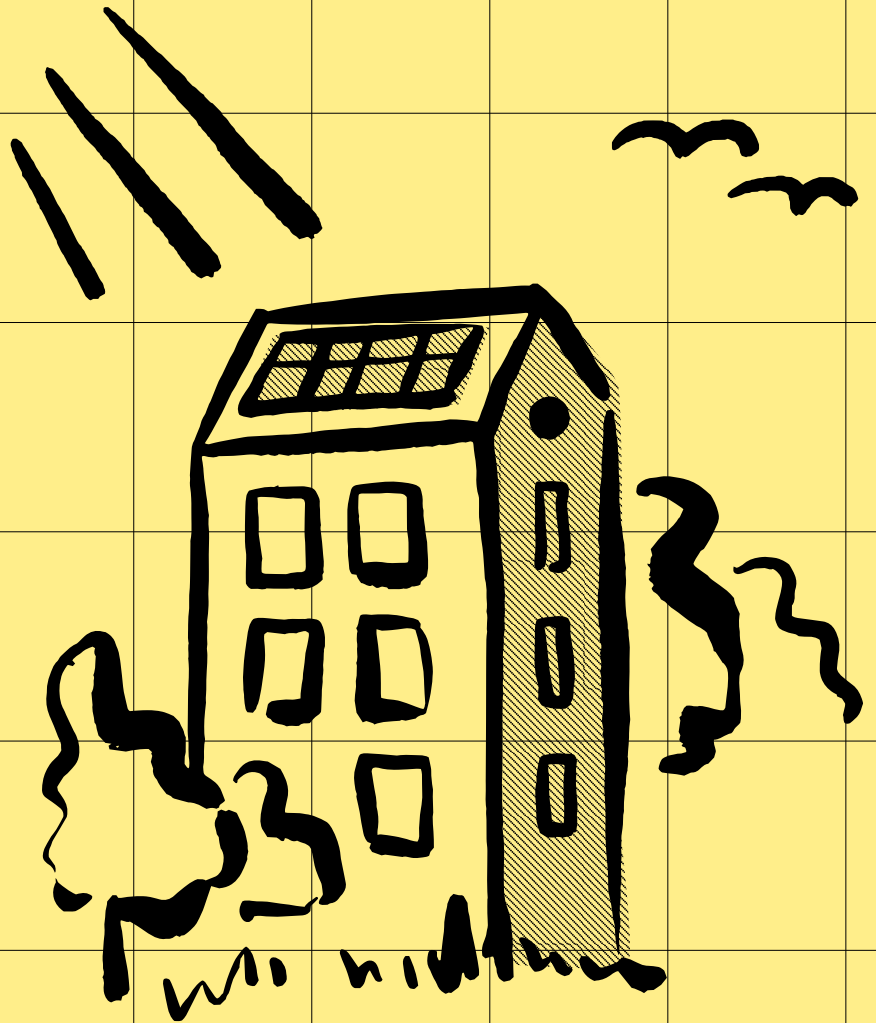
Steininger, K. W., Nabernegg, S., & Lackner, T. (2022). Konsum- und produktionsbasiertes Treibhausgas-Budget für die Steiermark und Aufteilungsansätze im Kontext der Klima- und Energiestrategie. Wegener Center for Climate and Global Change, University of Graz.

Theine, H., Humer, S., Moser, M., & Schnetzer, M. (2022). Emissions inequality: Disparities in income, expenditure, and the carbon footprint in Austria. Ecological Economics, 197, 107435. <https://doi.org/10.1016/j.ecolecon.2022.107435>

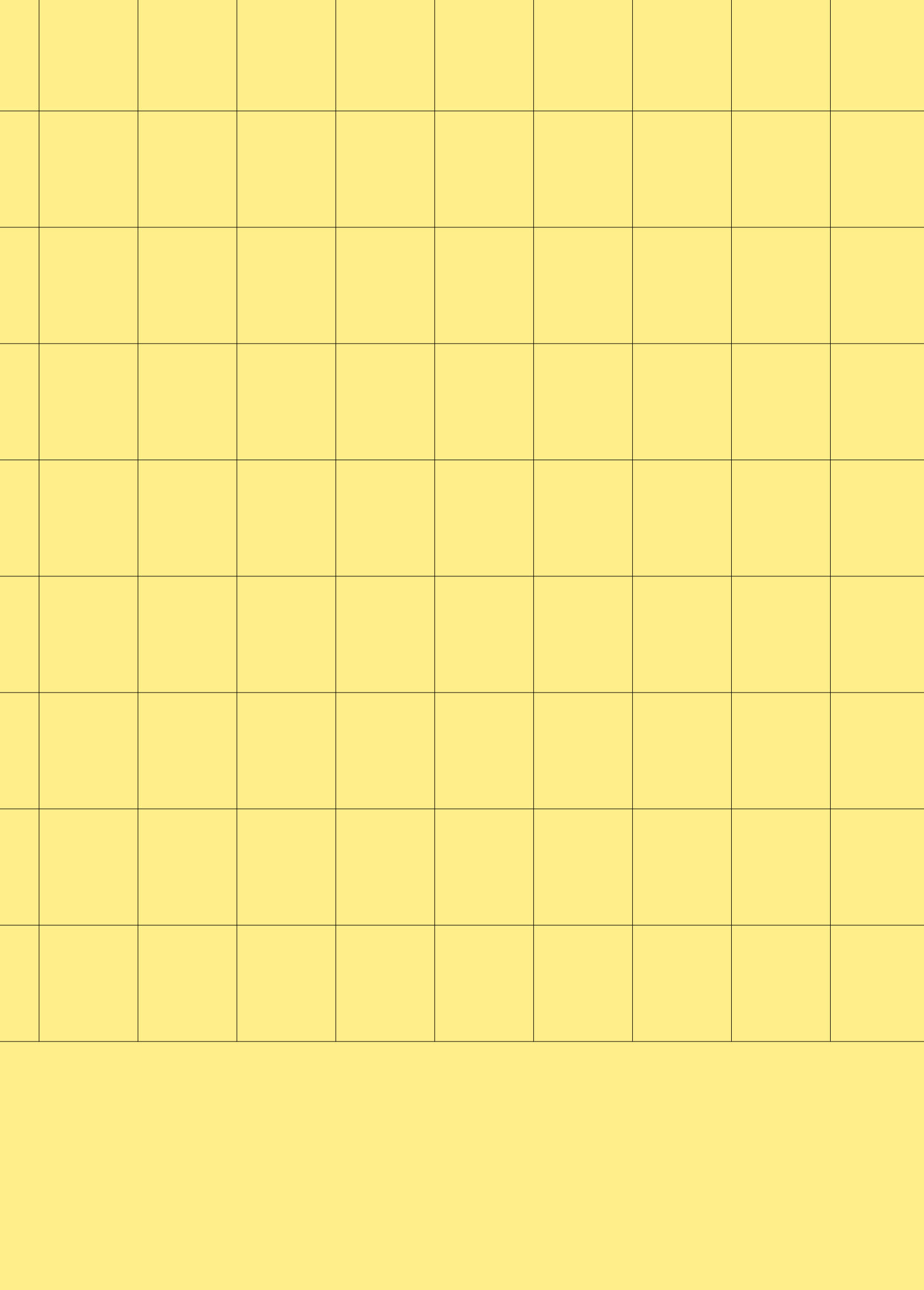
[illegible]



03	Financing of climate change mitigation measures
10	Catalogue of measures
50	List of references



05



Financing of climate change mitigation measures

The EU cooperates with the Republic of Austria to achieve the climate change mitigation targets. Austria receives financial support under several EU budget items, including 3.5 billion Euros from the Recovery and Resilience Facility (RRF) and 136 million Euros from the Just Transition Fund (JTF). The City of Linz, in turn, receives funds from the Republic of Austria via fiscal equalisation and direct transfers, which can be used for climate-related investments and expenses. According to the *Leitlinien der Linzer Stadtregierung 2021–2027*, present and medium-term funding for climate change mitigation measures comes from the follow sources:

- Reallocations in the budget of the City of Linz
- Implementation of individual projects of companies based in the City of Linz
- Cooperation with the State of Upper Austria and the Federal Government
- Involvement in international projects and optimal claiming of available funds (e.g. of the European Union) by the responsible technical business divisions
- Investments by industrial companies
- Financing of individual projects by banks and investors, where these act as stakeholders

10 million Euros have been invested in the electrification of mooring points for ships along the Danube and in the port of Linz, and the project is well advanced.

Immobilien Linz GmbH will invest around 15 to 20 million Euros for the construction of 100 new PV systems to increase the total output to over 18,000 kWp as part of the planned Linz Renewable Energy Community.

The climate fund of the City of Linz, amounting to one million Euros per year, is also an important instrument for financing local implementation measures of different target groups (e.g. city departments, companies, associations, universities and research institutes or private individuals). The current annual budget of the City of Linz for environmental and energy subsidies amounts to another 325,000 Euros. Public-to-public cooperations provide an alternative form of climate finance. For the implementation of the climate change mitigation project *Linz mit Ambitio3xn* (BMK mission “Klimaneutrale Stadt”), the City of Linz will receive two million Euros in funding from the Republic of Austria for the period 2023–2028.

The Linz City Government should use its best endeavours to ensure that the above-mentioned sources of financing will be available in the long term for measures derived from the climate neutrality concept and the climate change adaptation concept.

LINZ AG has a central role in financing the local energy transition in Linz. In the next ten years, for example, LINZ NETZ GmbH will invest around 700 million Euros in several grid reinforcement measures, ranging from the extension and new construction of transformer stations to the enhancement at all voltage levels. Besides, several million Euros are invested in the expansion of district heating every year. LINZ AG will invest around 73 million Euros over the next five years to implement the heat converter, a heat recovery project at the Linz-Mitte power plant park, using condensation and heat pump technology. Around

Major levers of climate change mitigation

For climate change mitigation measures to be successful, a wide variety of levers must be activated simultaneously. All superordinate strategies and bundles of measures that address the causal drivers of the human-induced climate crisis are referred to as major climate change mitigation levers. These drivers include fossil capitalism, excessive consumption and materialism, asymmetrical power structures and the exploitation of natural resources. Major climate change mitigation levers have a systemic effect, change structures and are effective regardless of the local conditions. They will lead to a comprehensive and sustained GHG reduction and can initiate social-ecological transformation.

The term lever is originally a concept used in mechanics; it represents a very illustrative metaphor for solving a problem by efficiently using resources so that the greatest possible impact for positive climate transformation is achieved. A lever can be activated by implementing multiple climate change mitigation measures in a specific activity area. The major climate change mitigation levers provide directions and approaches for an ambitious climate policy but are not identical to the implementation measures.

For the City of Linz, 30 major climate change mitigation levers have been defined in seven activity areas; these must be activated in the climate policy to achieve the goal of becoming climate neutral by 2040 at the latest:

Activity area: governance

- Credible role model effect of the City of Linz in climate change mitigation – communication and implementation are aligned
- Evidence-based climate policy and transparent decisions
- Citizen participation and a socially just climate policy
- Establishment of new alliances among politics, administration, business, science and civil society to push climate change mitigation and climate mainstreaming
- Climate finance and diversion of capital flows

Activity area: energy

- Defossilisation of the energy system with renewable energies (incl. grid expansion)
- Democratisation of the energy market
- Sector coupling and energy and material transfer between sectors
- Storage of renewable energies
- Energy efficiency for further reduction of the total energy requirement
- Energy sufficiency (i.e. use less energy) for further reduction of the total energy requirement

Activity area: buildings

- Climate neutral urban development and urban planning
- Lifecycle analysis in construction
- Building refurbishment and optimisation
- Reduction of surface area and soil utilisation in construction

Activity area: transport / mobility

- Avoidance of motorised private transport
- Technological change of vehicles towards climate-friendly drive types and provision of the required infrastructure
- Promotion of soft mobility forms
- Transformation of transport infrastructure and areas
- Avoidance of air transport
- Climate neutral freight transport and logistics

Activity area: industry und economy

- Transformation of the industry through the utilisation of green technologies
- Elimination of red tape in bureaucracy for swift climate change mitigation

- Energy sufficiency / reduction of the total energy requirement
- Promotion of a circular economy at product level
- Promotion of a circular economy at the material level or, respectively, a sustainable use of carbon sources

Activity area: consumption

- Promotion of climate-friendly lifestyles
- Reduction of incentives for climate-damaging consumption

Other activity areas

- Increase of potentials for carbon storage in the urban area
- Defossilisation of the waste management and wastewater disposal

Assessment of climate change mitigation measures

To provide decision-makers with a holistic assessment of the impact or effects of climate mitigation measures in the city of Linz, nine assessment criteria were defined:

Criterion 1: Greenhouse gas mitigation potential

The Wegener Center for Climate and Global Change of the University of Graz has developed a rating scale which estimates the overall effect of a fully implemented climate change mitigation measure based on the potential and effectiveness of that climate change mitigation measure as follows:

- High savings potential: Total effect > 3 %
- Medium savings potential: Total effect > 1 % to 3 %
- Low savings potential: Total effect < 1 %
- Cannot be determined

Formula: Total effect = potential * effectiveness [% reduction of the overall balance]
Potential = % percentage of the addressed GHG emissions of the overall balance
Effectiveness: Estimated reduction effect achieved through the measure in % of the potential
Comment: The overall effects of individual measures cannot always be viewed in an additive manner as measures may reinforce each other (e.g. a higher share of renewable energy in the electricity mix will increase the effectiveness of electrification in mobility) or diminish each other (e.g. the reduction of district heating emissions will reduce the potential of building refurbishments).

Criterion 2: Timeframe of the expected emissions reduction

It is important to specify the timeframe of the expected emission reduction to be achieved through a specific climate change mitigation measure in order to monitor the GHG budget of the city:

- GHG reduction already at the beginning of the measure
- GHG reduction at a later stage
- Cannot be determined

Criterion 3: Competence area

The competence area defines the political level(s) that can provide the general conditions required for implementing the climate change mitigation measure:

- European Union
- Republic of Austria
- State of Upper Austria
- City of Linz

Criterion 4: Responsibility area

This criterion defines the business divisions or departments of the Linz City Administration responsible for implementing the climate measure and/or the company of the Corporate Group of the City of Linz. Where multiple entities are involved or share the overall responsibility, cooperation across departments and/or organisations will be required (climate change mitigation is a cross-sectional matter), and a clearly defined lead must be appointed to implement climate change mitigation measures.

Criterion 5: Co-benefits or additional benefits
This criterion defines possible co-benefits or additional benefits generated by implementing a specific climate change mitigation measure for the City of Linz. For instance, these could have a positive effect on the quality of life or on biodiversity, could be associated with long-term cost savings, enhance climate change adaptation, etc.

- Comprehensive co-benefits: > 3 mentions
- Individual co-benefits: 1–3 mentions
- No co-benefits: 0 mentions

Criterion 6: Social impact
Climate change mitigation measures have different effects on social groups. It is, therefore, vital to consider the situation of especially vulnerable social groups when implementing climate change mitigation measures, for example, through compensating measures. Vulnerability characteristics include low income, age above 65 years, health impairments, migration background or low level of education. Other vulnerable groups are infants, toddlers (<5 years) and women. Critical comment: According to the BMSGPK study (2021) *Soziale Folgen des Klimawandels in Österreich*, there is an overlap between the characteristics of being a woman and other characteristics of vulnerability, as is supported by detailed evidence. Many vulnerability characteristics apply more frequently to women than to men, which can be attributed primarily to the structural disadvantage experienced by women. Similar overlaps in vulnerability characteristics can also be detected among people with a migration background or single parents. Social impacts of climate change mitigation measures arise when certain cause-and-effect processes (e.g. cost burden, access to mobility, etc.) coincide with vulnerability characteristics and result in a disproportionate material or health disadvantage.

In practice, a person or a group may be affected by multiple vulnerability characteristics simultaneously and can benefit from or be disadvantaged by a specific climate change mitigation measure both directly and indirectly. Disproportionate impact means: affected more strongly than the overall population.

The criterion draws attention to a socially just climate change mitigation while attempting to promote a socially responsible access in the city’s climate policy. Specific social compensating measures must be planned for each individual measure. Social compensatory measures are intended to counteract possible cause-and-effect processes and should consider the characteristics of the affected vulnerable groups. The BMSGPK study (2021) *Soziale Folgen des Klimawandels in Österreich*, including its methodology, provides guidelines in this regard. The City of Linz intends to avoid generalising assumptions on the social impact.

- Social compensatory measures must be taken as a disproportionate social impact can be expected when the measures are implemented
- Cannot be determined

Note: Cause-and-effect processes = investment assets, cost burden, emission burden, heat burden, social inclusion, displacement, mobility access; *Cannot be determined* in the climate neutrality concept means that possible effects will be reviewed when the climate change mitigation measures are implemented

Criterion 7: Citizen participation
This criterion summarises the recommendations prepared as part of the citizen participation for climate change mitigation measures (see Chapter 03). A comment regarding implementing those climate change mitigation measures that the participants considered particularly relevant has been added.

Criterion 8: Cooperations
This criterion identifies additional stakeholder groups that could provide a valuable contribution to the implementation of the climate change mitigation measure, including networks, associations, trade, etc.

Criterion 9: Transformation potential
This criterion summarises the preceding criteria for political decision-makers to indicate the specific climate policy development path that will be taken through the respective climate change mitigation measure. The independent assessment is done by the Wegener Center for Climate and Global Change – University of Graz:

- Transformative / very ambitious climate policy development path
- Reformative / relatively ambitious climate policy development path
- Incremental / little ambitious climate policy development path

Note:
Transformative = very ambitious climate policy development path
A fundamental shift in governance, economy and lifestyle and in the socio-political systems that address the roots/drivers of the climate crisis. The intended goal is to move away from social-ecologically exploitative mechanisms and towards a carbon-restorative economy (i.e. net return of carbon from the atmosphere to the biosphere). Relevant factors in this regard include the development of GHG sinks (e.g. large-scale renaturation of ecosystems), post-growth strategies (e.g. a sufficiency policy aimed at reducing resource consumption in absolute terms, a reduction of consumption incentives, strengthening of subsistence and the creation of regional, resilient economic cycles), an industrial transition, car-free mobility in cities, a strengthening or ‘upgrade’ of democracy (e.g. through climate citizens’ councils), a decolonisation policy and an emancipatory and comprehensive redistribution policy. Global warming will be limited to +1.5 °C or +2 °C relative to the pre-industrial era if these measures are taken globally. Current and future generations will be able to adapt to the global warming that has already taken place. To achieve global climate justice, we strive for a good life for all people and creatures that live on our planet.

Reformative / relatively ambitious climate policy development path
Measures that require bold technological and social innovation, supported by significant guidance and incentives on the part of governments in order to achieve a transition of society towards a low-carbon or climate neutral economy. These changes will require a reform of the existing socio-political systems and a comprehensive infrastructural reform (e.g. energy supply systems for suburbs, decentralisation of the grid). Examples include climate neutral mobility (without substantially reducing motorisation), a climate neutral economy and/or CO₂-free industry (without reducing absolute resource consumption), so-called “green growth” strategies, far-reaching adaptation measures (without compensating for the unequal opportunities of small privileged groups), a ban on fossil fuels and industries including accompanying social measures, e.g. worker retraining programs (without changing the socio-economic structures and balances of power, i.e. without producing a structural transformation). The +1.5 °C or +2 °C limit relative to the pre-industrial era will not be met if these measures are taken collectively on a global scale. Global warming will be slowed down to higher temperature values – the ecological and social consequences for current and future generations, living beings and ecosystems will be devastating.

Incremental / little ambitious climate policy development path
Small and inadequate steps towards climate change mitigation that are considered 100 % politically safe are taken, such as focusing on energy efficiency measures and awareness-raising campaigns. The planned measures do not question our present approaches to the utilisation of natural resources, socio-political regulations, the economy and existing infrastructure. The roots/drivers of the climate crisis are not addressed or remedied; instead, the focus is placed on treating the symptoms, promoting individual flagship projects and executing acutely needed adaptation measures. Examples include untested and risky technologies such as carbon capture & storage and other forms of geoengineering, which aim to marginally mitigate the effects of the climate crisis and refrain from transformational solutions, the greenwashing of fossil and nuclear energies as climate-friendly, and funding programs aimed at so-called “sustainable consumption”, CO₂ compensation projects, political appeals to personal responsibility without providing any structural incentives. The +1.5 °C or +2 °C limit will be missed by far if these measures are taken collectively on a global scale – with unforeseeable catastrophic consequences for current and future generations or living beings and ecosystems.

Measures at a glance

Climate change mitigation measures refer to individual or bundled implementations that will result in an effective and measurable GHG reduction. Climate change mitigation measures are the weight attached to the major climate change mitigation levers, so to speak, and provide more specific content than the latter. In order to be effective, climate change mitigation measures must be optimally adapted to the local conditions in the City of Linz. Measures should be politically ambitious and, at the same time, acceptable to the population; they must not contribute to “pseudo” climate change mitigation or only serve as a way to

Activity area: governance

- Regular city-wide greenhouse gas monitoring and reporting to the Linz City Government
- Aligning the municipal budget with climate work
- Climate neutral Linz City Administration
- Establishment of a twin town partnership for climate neutrality

Activity area: energy

- Defossilisation of district heating / cooling supply
- Expansion of district heating / cooling supply
- Dismantling the fossil gas infrastructure where possible
- Integration of industrial waste heat into the energy system
- Linking the district heating plant of LINZ AG to the hydrogen infrastructure (example: Project *EUH2STARS*)

ease our conscience. Regular monitoring of climate change mitigation measures is particularly important to ensure an evidence-based climate policy in Linz. Greenhouse gases must be reduced by implementing measures, and each individual measure is assigned major climate change mitigation levers. Only unavoidable residual emissions may be compensated. For the City of Linz, 52 climate change mitigation measures have been defined in seven activity areas in total; these should be implemented swiftly to achieve the goal of becoming climate neutral by 2040 at the latest:

- Expansion of roof-mounted photovoltaic systems
- Construction of photovoltaic systems on sealed surfaces and open spaces
- Creation of renewable energy communities (REC)
- Increase in subsidies for photovoltaic storage solutions
- Promotion of solar thermal energy
- Investigation of geothermal potential in the greater Linz area
- Exploitation of existing biomass potential
- Climate change mitigation-orientated spatial energy planning
- Investigation of carbon capture and utilisation (CCU) technologies for power stations
- Storage of electricity and heat from renewable energies to compensate for seasonal and short-term fluctuations
- Promotion of energy consultation for private individuals, companies and associations

Activity area: buildings

- Development of climate neutral neighbourhoods in the Linz urban area
- Non-profit residential and urban development according to the lowest energy standard and climate neutrality standards
- Thermal-energetic refurbishment of existing buildings
- Compaction of existing buildings
- Construction of buildings / structures using CO₂-optimised construction methods (hybrid construction, timber construction, etc.) and use of circular building products
- Activation of brownfield sites and vacancy management with a focus on trade
- Consultation with the State of Upper Austria on increasing the Upper Austrian housing subsidies and taking account of climate neutrality targets in the subsidy guidelines

Activity area: transport / mobility

- Expansion, densification and acceleration of public transport
- Expansion of the charging infrastructure for electric vehicles available to the public
- Increased public funding for the charging infrastructure for electric vehicles
- Expansion and improvement of the inner-city bicycle path infrastructure
- Improvement of the pedestrian infrastructure and promotion of pedestrian traffic
- Changes of the modal split in favour of soft mobility through regulations and incentives (push & pull)
- Parking space management
- Expansion and new construction of infrastructure for Bike & Ride and Park & Ride at public transport hubs
- Expansion of restricted traffic zones
- Expansion of bicycle highway networks to Linz and surroundings
- Expansion of e-car sharing services
- Expansion of the shore-side power supply for Danube shipping
- Electrification of the municipal vehicle fleet, including the implementation of operational

mobility management with a clear focus on climate change mitigation

- Establishment of pedestrian and shared zones in all parts of the city

Activity area: industry und economy

- Development of a green hydrogen economy in Linz
- Creation of an infrastructure for the import of green hydrogen
- Acceleration and simplification of the official authorisation procedure for climate-friendly key technologies
- Investigation of potential on all levels of the circular economy (secondary raw materials, recyclable products and carbon capture and utilisation) and development of a circular economy in Linz
- Climate change mitigation pact between the City of Linz and Linz companies

Activity area: consumption

- Promotion of vegetarian and vegan, as well as regional and seasonal diets incl. awareness raising
- Consumption-free zones in the city centre (indoor and outdoor areas)
- Expansion of lending services modelled on the Dinglei(h) system
- Awareness raising and offers for climate-friendly consumption by the City of Linz

Other activity areas

- Defossilisation of the waste management through climate-friendly technologies
- Investigation and strengthening of natural greenhouse gas, respectively carbon sinks in the Linz urban area (forests, wetlands)

As some climate change mitigation measures, such as, for example, the Linz Regional City Rail, are subject to a certain lead time due to longer planning periods and the effect of the GHG reduction can therefore not be achieved immediately, climate change mitigation measures should be implemented swiftly and comprehensively in the City of Linz. The Intergovernmental Panel on Climate Change has also emphasised that, in order not to jeopardise the +1.5 °C or +2 °C limit stipulated in the Paris Agreement, prompt and

far-reaching system transitions of unprecedented magnitude must be implemented in our current energy, land, urban and infrastructure systems (including transport and buildings) and in industrial systems. Far-reaching climate change mitigation measures must be taken in all activity areas of cities, which will inevitably also require more financial investments. Investments relevant to climate change mitigation must comply with budget or fiscal requirements.

From a climate science perspective, all climate change mitigation measures listed in this catalogue of measures can directly or indirectly contribute to reducing GHG emissions or to improving natural carbon sinks in the City of Linz and, as a collective, will promote a social-ecological transformation. In order to ensure that the City of Linz will make a fair contribution to meeting the global +1.5 °C or +2 °C limit stipulated in the Paris Agreement, it is important to understand that the climate change mitigation measures prepared in this catalogue of measures and in other preparatory work, such as, for example, the *KlimaStadtLinz2030* project or climate fund projects, are not either/or

decisions. All purposeful, socially just and technically feasible solutions must be taken immediately to achieve the goal of climate neutrality by 2040 and to increase prosperity. The climate change mitigation measures necessary for this will require an unprecedented level of scope, depth and city-wide coordination. In all activity areas, business divisions of the Linz City Administration, companies and households in the City of Linz, climate transformation can only be successful if it is pursued ambitiously and on a democratic basis by all stakeholders.

While certain success factors, such as the political will, social acceptance or long-term climate finance, will have a positive impact on the implementation of climate change mitigation measures, there are also risks or obstacles that will slow down or completely prevent the success of climate change mitigation. Examples include pseudo-climate change mitigation, inadequate legal bases, financial shortfalls or resistance of society. Success factors and risks or obstacles should be taken into account during all implementations.

Catalogue of measures

Activity area: governance

Measure No. 1

Regular city-wide greenhouse gas monitoring and reporting to the Linz City Government

Major climate change mitigation levers

Credible role model effect of the City of Linz in climate change mitigation – communication and implementation are aligned; evidence-based climate policy and transparent decisions

Description of the measure

The success of the Clean Air Act in Linz was based on strict compliance with air pollution limits through regular monitoring of air pollutant emissions. In order to achieve the goal of climate neutrality by 2040, analogous GHG emission monitoring should be implemented as soon as possible. In a first step, a comprehensive data management (system) relevant to greenhouse gases should be established by the Linz City Administration and on the part of UGL. Ideally, GHG emissions of the City of Linz should be assessed in detail for the entire city annually, or at least every two years, in accordance with the GHG Protocol standard. Monitoring can be supported by appropriate software and should illustrate the current reduction pathway and the city-wide GHG budget still available. To facilitate climate change mitigation control, the monitoring results should be reported to the Linz City Government at regular intervals and should ideally also be published.

GHG savings potential

Cannot be determined

Time of GHG reduction

Cannot be determined

Competence area

City of Linz; State of Upper Austria; Republic of Austria

Responsibility area

Geschäftsbereich Planung, Technik und Umwelt, Direktion, jointly with the Geschäftsbereich Büro Stadtregierung Linz, Abteilung Wirtschaft, Innovation, Klimaschutz und EU and the Abteilung Umwelttechnik

Co-benefits

Improved data management across departments and organisations

Social impact

Cannot be determined

Citizen participation

It is recommended to make the measurement of climate targets of the City compulsory, and additional measures should be defined promptly if targets are missed.

Cooperations

Umweltbundesamt GmbH; Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology; State of Upper Austria; other cities in Austria

Transformation potential

Reformative / relatively ambitious climate policy development path

Measure No. 2

Aligning the municipal budget with climate work

Major climate change mitigation levers

Credible role model effect of the City of Linz in climate change mitigation – communication and implementation are aligned; climate finance and diversion of capital flows

Description of the measure

The currently used process for preparing the City’s budget estimate is unsuitable for replicating a climate budget. As a rule, the budget process is coordinated by the responsible business divisions of the Linz City Administration and at budget meetings. The establishment of a climate finance working group is advisable to assess the financing requirements of the climate measures included in the climate neutrality concept and the climate change adaptation concept that fall in the direct and extended spheres of influence. Other tasks would include defining the amount of funds necessary to achieve the City’s climate targets and estimating opportunity and follow-up costs. An interdepartmental working group could focus on climate finance to assist in climate policy management and the monitoring of climate change mitigation measures. Consequently, the Geschäftsbereich Finanzen is requested to provide support for this working group.

GHG savings potential

Cannot be determined

Time of GHG reduction

Cannot be determined

Competence area

City of Linz

Responsibility area

Geschäftsbereich Büro Stadtregierung Linz, Abteilung Wirtschaft, Innovation, Klimaschutz und EU and Geschäftsbereich Planung, Technik und Umwelt, Abteilung Stadtklimatologie und Umwelt, jointly with the Geschäftsbereich Finanzen

Co-benefits

Costs of not acting are avoided (in the medium and long term)

Social impact

Cannot be determined

Citizen participation

A long-term view of climate-relevant investment and the financing of climate change mitigation measures is recommended.

Cooperations

Other cities in Austria, e.g. Vienna, Graz, etc.

Transformation potential

Transformative / very ambitious climate policy development path

Measure No. 3

Climate neutral Linz City Administration

Major climate change mitigation levers

Credible role model effect of the City of Linz in climate change mitigation – communication and implementation are aligned

Description of the measure

Public administration should act as a role model in climate transformation. In line with its corporate strategy, the goal is for the entire Linz City Administration to become climate neutral in the foreseeable future. Based on the climate neutrality concept and the corresponding GHG sub-inventory for the Linz City Administration and the Corporate Group of the City of Linz, the Municipal Directorate of the City Government is expected to initiate an implementation project tailored to this measure. The priority areas of the project to be implemented

across the City Government will be the development of effective mobility management according to the *klimaaktiv mobil* standard, the action plan for sustainable public procurement and the possible introduction of *the European Eco Management and Audit Scheme* (EMAS). The technical foundation and data necessary for the implementation is largely already available from preparatory climate-related projects undertaken in the City of Linz.

GHG savings potential

Low savings potential: Total effect < 1 %

Time of GHG reduction

GHG reduction already at the beginning of the measure

Competence area

City of Linz

Responsibility area

Geschäftsbereich Magistratsdirektion (lead), jointly with all business divisions und Kinder- und Jugend-Services

Co-benefits

Costs of not acting are avoided (in the medium and long term); increased competitiveness of the Linz municipality in the labour market

Social impact

Cannot be determined

Cooperations

klimaaktiv; Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology; State Administration of Vorarlberg

Transformation potential

Reformative / relatively ambitious climate policy development path

Measure No. 4

Establishment of a twin town partnership for climate neutrality

Major climate change mitigation levers

Establishment of new alliances among politics, administration, business, science and civil society to push climate change mitigation and climate mainstreaming

Description of the measure

The European Council created the idea of twin cities after the Second World War. At present, Linz has twenty twin cities (Budweis, Kansas City, Tampere, etc.) that exchange experiences and work together on joint implementation projects. Since cities face similar climate transformation challenges, the City of Linz should attempt to find a suitable twin city within or outside the European Union with a focus on climate neutrality. The Climate Advisory Board City of Linz has already developed the twin-city partnership criteria. At a national level, the project *Linz mit Ambitio3xn* already enjoys fruitful cooperation with other Austrian cities.

GHG savings potential

Cannot be determined

Time of GHG reduction

Cannot be determined

Competence area

City of Linz

Responsibility area

Geschäftsbereich Büro Stadtregierung Linz, Abteilung Wirtschaft, Innovation, Klimaschutz und EU

Co-benefits

Enhanced visibility of the City of Linz at international level

Social impact

Cannot be determined

Cooperations

Climate Change Centre Austria

Transformation potential

Incremental / little ambitious climate policy development path

Activity area: energy

Measure No. 5

Defossilisation of district heating / cooling supply

Major climate change mitigation levers

Defossilisation of the energy system with renewable energies (incl. grid expansion); energy efficiency for further reduction of the total energy requirement

Description of the measure

Over the past decade, district heating production by LINZ AG has increased by 18 %. More than 70 % of households have been connected to district heating. In addition, energy efficiency and district heating output were increased through technical optimisation of the waste-to-energy heat and power plant and the Linz-Süd district heating power plant. For several years, the percentage of renewable energy sources, such as biomass and residual waste, used for the generation of district heating has been consistently high. This percentage is increased even further by the use of condensation and heat pump technology. The share of renewable energy sources is planned to be doubled from currently 40 % to 80 % by 2035. LINZ AG continues to increase the number of district heating connections and expand the grid in order to reduce GHG emissions and enhance efficiency through centralised energy supply. In the future, it will become increasingly important to expand and decarbonise the district cooling supply. Compared to the use of domestic air conditioning, district cooling generates less GHG emissions. The refrigeration machines used by LINZ AG are currently operated fully electrically. Drainage water from the Danube is currently used for cooling, while district heating is based on the thermal utilisation of waste.

GHG savings potential

Medium savings potential: Total effect > 1 % to 3 %

Time of GHG reduction

GHG reduction already at the beginning of the measure

Competence area

City of Linz

Responsibility area

LINZ AG

Co-benefits

Reduction of energy costs; contribution to grid stabilisation; enhanced security of supply

Social impact

Cannot be determined

Cooperations

National and international research institutes; industry

Transformation potential

Reformative / relatively ambitious climate policy development path

Measure No. 6

Expansion of district heating / cooling supply

Major climate change mitigation levers

Defossilisation of the energy system with renewable energies (incl. grid expansion); energy efficiency for further reduction of the total energy requirement

Description of the measure

Over the past few decades, district heating in Linz has been expanded successively. Today, more than 70 % of households have been connected to district heating. LINZ AG continues to increase the number of district

heating connections and expand the grid in order to reduce GHG emissions. Approx. 2,000 additional dwellings are planned to be supplied by district heating. Moreover, the district heating supply area will gradually be expanded to include new areas with the aim of eventually connecting up to approx. 6,000 one-family dwellings to the district heating network. The district cooling network will also be expanded gradually.

GHG savings potential Medium savings potential: Total effect > 1 % to 3 %	Co-benefits Reduction of energy costs; enhanced security of supply; improvement of air quality
Time of GHG reduction GHG reduction already at the beginning of the measure	Social impact Cannot be determined
Competence area City of Linz	Cooperations None
Responsibility area LINZ AG	Transformation potential Reformative / relatively ambitious climate policy development path

Measure No. 7

Dismantling the fossil gas infrastructure where possible

Major climate change mitigation levers

Defossilisation of the energy system with renewable energies (incl. grid expansion)

Description of the measure

As a result of the continuous expansion of district heating by LINZ AG, the number of users of the gas infrastructure is declining. In order to supply customers with renewable energies and, at the same time, reduce the high costs associated with maintaining a parallel infrastructure, the gas network is to be steadily dismantled where possible and in areas where fewer consumers are using the existing infrastructure, in deviation from the regulatory framework. At present, there are still around 2,000 gas stoves, 3,000 gas water heaters for hot water supply and around 15,000 gas-heated dwellings in the region supplied with district heating by LINZ AG. In order to implement the measure, current users should be convinced to change to district heating, and the switch from gas stoves to electric stoves should be promoted.

GHG savings potential Cannot be determined	Co-benefits Reduction of energy and infrastructure costs; enhanced security of supply; improvement of air quality
Time of GHG reduction GHG reduction already at the beginning of the measure	Social impact Cannot be determined
Competence area City of Linz	Cooperations None
Responsibility area LINZ AG	Transformation potential Reformative / relatively ambitious climate policy development path

Measure No. 8

Integration of industrial waste heat into the energy system

Major climate change mitigation levers

Sector coupling and energy and material transfer between sectors; energy efficiency for further reduction of the total energy requirement

Description of the measure

The potential of integrating waste heat generated by industrial plants of Linz’s large-scale industry based on the city’s district heating supply is not fully exploited. There is considerable capacity potential, the direct use of which would save and replace natural gas. The district heating network should be further expanded to facilitate increased use of industrial waste heat, and additional buildings should be connected. At the same time, economic relationships with suitable companies focussed on the use of waste heat should be established. From a technical point of view, direct use of waste heat produced by the industry and by purpose-built generation plants would be relatively easy to implement using large heat pumps. Seasonal storage technologies such as large heat storage vessels would be required to ensure the year-round use of industrial waste heat. As part of the *Projekt Heat Highway* (NEFI – New Energy for Industry), interregional heat transfer networks will also be investigated for the Linz location by August 2024.

GHG savings potential Already considered in measure No. 5	Co-benefits Improvement of air quality; reduction of energy costs; enhanced security of supply; increased attractiveness of the business location
Time of GHG reduction GHG reduction already at the beginning of the measure	Social impact Cannot be determined
Competence area City of Linz	Cooperations Energieinstitut at the Johannes Kepler University; industry
Responsibility area LINZ AG	Transformation potential Transformative / very ambitious climate policy development path

Measure No. 9

Linking the district heating plant of Linz AG to the hydrogen infrastructure (example: Project *EUH2STARS*)

Major climate change mitigation levers

Defossilisation of the energy system with renewable energies (incl. grid expansion); sector coupling and energy and material transfer between sectors

Description of the measure

To reliably supply urban agglomerations with energy in the form of green heat and electricity throughout the year, including in winter, it is necessary to connect the central Linz Mitte and Linz Süd power plants to the Europe-wide envisaged hydrogen pipeline network and hydrogen storage tanks. The Project *EUH2STARS* may serve as an example: As part of the Austrian section of the project, consortium leader RAG Austria AG,

jointly with LINZ AG, AGGM Austrian Gas Grid Management AG, Axiom and the Energieinstitut at JKU Linz will demonstrate, for the first time, in respect of the Linz metropolitan area, how summer sunlight can be used to reliably supply urban agglomerations with green heat and electricity throughout the year, including in winter. The project is a cornerstone in the endeavours pursued by the City of Linz and LINZ AG to expand district heat supply to 100 % renewable sources by 2040. The connection to hydrogen storage tanks investigated in the project is an important basis for ensuring a reliable supply. To permit long-term use of the stored hydrogen in the power plants of LINZ AG, the project investigates the combined heating and power plant (FHKW) Linz-Süd as well as the upstream infrastructure in terms of the suitability of these for hydrogen. If the result is positive, the same is theoretically also possible for the FHKW Linz Mitte.

GHG savings potential

Cannot be determined

Time of GHG reduction

GHG reduction at a later stage

Competence area

City of Linz

Responsibility area

LINZ AG

Co-benefits

Improvement of air quality; reduction of energy costs; enhanced security of supply; increased attractiveness of the business location

Social impact

Cannot be determined

Cooperations

RAG Austria AG; AGGM Austrian Gas Grid Management; Axiom; Energieinstitut at the Johannes Kepler University

Transformation potential

Transformative / very ambitious climate policy development path

Measure No. 10

Expansion of roof-mounted photovoltaic systems

Major climate change mitigation levers

Defossilisation of the energy system with renewable energies (incl. grid expansion)

Description of the measure

LINZ AG installs photovoltaic systems for industrial and trade customers, public and non-profit institutions. Photovoltaic capacity is expected to reach 20 megawatts peak by 2030 and will primarily be installed on roofs. As part of the push to increase the use of photovoltaic systems, Immobilien Linz GmbH will build 100 new photovoltaic systems on municipal buildings over the next few years to cover 40 per cent of the annual electricity consumption of the City of Linz. In addition, the City of Linz envisages making photovoltaic systems or alternative forms of renewable energy generation an official requirement for new buildings (e.g., by issuing a corresponding ordinance for all development plans of the City of Linz).

GHG savings potential

Medium savings potential: Total effect > 1 % to 3 %

Time of GHG reduction

GHG reduction from the beginning of the measure

Competence area

City of Linz

Responsibility area

Immobilien Linz GmbH (lead for public buildings) jointly with LINZ AG, Geschäftsbereich Bau- und Bezirksverwaltung as well as Geschäftsbereich Planung, Technik und Umwelt

Co-benefits

Improvement of air quality; reduction of energy costs

Social impact

Cannot be determined

Cooperations

Federal Association Photovoltaic Austria

Transformation potential

Reformative / relatively ambitious climate policy development path

Measure No. 11

Construction of photovoltaic systems on sealed surfaces and open spaces

Major climate change mitigation levers

Defossilisation of the energy system with renewable energies (incl. grid expansion)

Description of the measure

When constructing photovoltaic systems on sealed surfaces (e.g. in streets) and open spaces, conflicts with food production, the ecological balance of the area or climate change adaptation, as well as townscape and landscape aspects, etc., should be avoided as far as possible. Impact studies to ensure nature-friendly implementation are required. Agri-photovoltaic approaches could offer a solution in which agricultural and forestry uses are combined with electricity generation.

GHG savings potential

Low savings potential: Total effect < 1 %

Time of GHG reduction

GHG reduction already at the beginning of the measure

Competence area

City of Linz

Responsibility area

Geschäftsbereich Planung, Technik und Umwelt

Co-benefits

Reduction of energy costs

Social impact

Cannot be determined

Cooperations

State of Upper Austria; Federal Association Photovoltaic Austria

Transformation potential

Incremental / little ambitious climate policy development path

Measure No. 12

Creation of renewable energy communities (REC)

Major climate change mitigation levers

Defossilisation of the energy system with renewable energies (incl. grid expansion); democratisation of the energy market

Description of the measure

Renewable energy communities (REC) provide municipalities, SMEs, and private individuals with the opportunity to produce, store, and consume electricity jointly. As part of the push to increase the use of photovoltaic systems, a Linzer Energiegemeinschaft Gesellschaft (LEG) for RECs for municipal objects is planned to be established. The LEG is to function as the central control unit for the RECs distributed throughout the urban area. The City of Linz will be the company's majority owner, while Immobilien Linz GmbH (ILG) will hold minority shares in the company and thus contribute its expertise in facility design, construction and

financing. As the owner of the majority of the buildings, ILG will be the implementing entity and the owner of the PV systems and will also lease these to the respective energy communities. As consumers, the City and its business divisions will benefit from lower and stable electricity production rates.

GHG savings potential Cannot be determined	Co-benefits Reduction of energy costs
Time of GHG reduction GHG reduction from the beginning of the measure	Social impact Social compensatory measures must be taken as a disproportionate social impact can be expected when the measures are implemented
Competence area City of Linz	Cooperations Österreichische Koordinationsstelle für Energie-gemeinschaften des Klima- und Energiefonds (Austrian Coordination Office for Energy Communities of the Climate and Energy Fund)
Responsibility area Linzer Energiegemeinschaft GmbH (lead), jointly with the Geschäftsbereich Gebäudemanagement und Tiefbau and Immobilien Linz GmbH	Transformation potential Transformative / very ambitious climate policy development path

Measure No. 13

Increase in subsidies for photovoltaic storage solutions

Major climate change mitigation levers

Defossilisation of the energy system with renewable energies (incl. grid expansion); storage of renewable energies

Description of the measure

Photovoltaic systems and electricity storage facilities can make a significant contribution to climate neutral electricity and heat supply. The City of Linz subsidises private individuals, companies and organisations that wish to install photovoltaic systems and/or electricity storage systems. It is vital to continue and, in view of the current high demand, increase financial subsidies for photovoltaic systems including electricity storage facilities provided by the City. The Geschäftsbereich Finanzen is requested to provide the necessary funds. Where applicable, possible duplicate subsidies resulting from similar funding provided by other local authorities should be avoided.

GHG savings potential Cannot be determined	Co-benefits Reduction of energy costs
Time of GHG reduction GHG reduction only at a later stage	Social impact Social compensatory measures must be taken as a disproportionate social impact can be expected when the measures are implemented
Competence area City of Linz	Cooperations None
Responsibility area Geschäftsbereich Planung, Technik und Umwelt, Abteilung Stadtklimatologie und Umwelt (lead), jointly with the Geschäftsbereich Finanzen	Transformation potential Reformative / relatively ambitious climate policy development path

Measure No. 14

Promotion of solar thermal energy

Major climate change mitigation levers

Defossilisation of the energy system with renewable energies (incl. grid expansion)

Description of the measure

Solar thermal energy can make an important contribution to achieving a climate neutral heat supply in the future. At present, the City of Linz provides financial subsidies for installing a solar system for hot water supply and/or to complement heating depending on the solar system’s output for houses with up to three apartments. An analogous funding program is also available for houses with more than three apartments. Solar system funding provided by the City should, therefore, be continued and, if necessary, expanded if there is enough demand. The Geschäftsbereich Finanzen is requested to provide the necessary funds.

GHG savings potential Cannot be determined	Co-benefits Reduction of energy costs
Time of GHG reduction GHG reduction only at a later stage	Social impact Social compensatory measures must be taken as a disproportionate social impact can be expected when the measures are implemented
Competence area City of Linz; State of Upper Austria	Cooperations None
Responsibility area Geschäftsbereich Planung, Technik und Umwelt, Abteilung Stadtklimatologie und Umwelt (lead), jointly with the Geschäftsbereich Finanzen	Transformation potential Reformative / relatively ambitious climate policy development path

Measure No. 15

Investigation of geothermal potential in the greater Linz area

Major climate change mitigation levers

Defossilisation of the energy system with renewable energies (incl. grid expansion)

Description of the measure

Geothermal energy is a renewable resource offering a wide range of possible uses, including electricity generation and also heating and cooling. The potential for geothermal energy has not yet been investigated in the Linz urban area and the surrounding municipalities. However, according to climate research, there is a medium potential in the region of the Bohemian Massif due to the widespread presence of elevated temperatures and granite or granite-like rocks. Against this background and in view of the necessary renewable energy transition, it is recommended that scientific studies of the geothermal energy potential, especially deep geothermal energy in the greater Linz area, be conducted. The research should be carried out promptly and based on the results, a decision on possible implementations should be made.

GHG savings potential Cannot be determined	Co-benefits No co-benefits
Time of GHG reduction Cannot be determined	Social impact Cannot be determined
Competence area City of Linz	Cooperations Geosphere Austria; State of Upper Austria; City of Vienna
Responsibility area Geschäftsbereich Planung, Technik und Umwelt, Abteilung Umwelttechnik (lead) jointly with the Geschäftsbereich Büro Stadtregierung Linz, Abteilung Wirtschaft, Innovation, Klimaschutz und EU	Transformation potential Incremental / little ambitious climate policy development path

Measure No. 16

Exploitation of existing biomass potential

Major climate change mitigation levers

Defossilisation of the energy system with renewable energies (incl. grid expansion)

Description of the measure

The biomass-fired combined heat and power plant at the Linz-Mitte district heating plant generates electricity and district heating. Biological, naturally grown and renewable fuels are considered biomass. Normally, these are renewable raw materials, such as wood and wood residues. The GHG emissions released when burning biomass are deemed to be climate neutral (provided that equivalent amounts will be bound by growing biomass). The expansion of biomass power plants represents one way to replace natural gas as Linz’s primary energy source for electricity and heat generation. Any possible exploitation of the existing biomass potential will be subject to the installation of a highly efficient dust-filtering system to avoid dust emissions and nitrogen oxides. However, it should be noted that if the used wood does not come exclusively from residues from wood production and use and if wood energy is increased throughout Austria, this could lead to a reduced carbon sink effect in Austrian forests or an increase in import dependencies. In addition, EU directive RED III (Renewable Energy Directive) is set to significantly restrict future use of biomass.

GHG savings potential Already included in Measure No. 5	Co-benefits Enhanced security of supply; contribution to grid stabilisation
Time of GHG reduction GHG reduction already at the beginning of the measure	Social impact Cannot be determined
Competence area City of Linz	Cooperations Österreichischer Biomasse-Verband (Austrian Biomass Association)
Responsibility area LINZ AG	Transformation potential Incremental / little ambitious climate policy development path

Measure No. 17

Climate change mitigation-orientated spatial energy planning

Major climate change mitigation levers

Climate neutral urban development and urban planning

Description of the measure

Climate change mitigation-orientated spatial energy planning is focussed on the spatial dimension of energy consumption and supply, considering a city’s climate neutrality goals. According to the Environment Agency Austria, spatial energy planning combines urban development with energy planning to create a stable, efficient, ecological energy supply. The goal is to create functionally mixed, moderately densified, compact districts that permit energy-efficient lifestyles and economies and are supplied with highly affordable renewable energy sources. The Geschäftsbereich Planung, Technik und Umwelt is requested to continue climate change mitigation-oriented spatial energy planning through redensification, mixed uses and indirectly through parking space management and to pursue this in a targeted manner using all available planning instruments.

GHG savings potential Cannot be determined	Co-benefits Reduction of energy costs
Time of GHG reduction Cannot be determined	Social impact Cannot be determined
Competence area City of Linz	Cooperations Geschäftsstelle der Österreichischen Raumordnungskonferenz (Office of the Austrian Conference on Spatial Planning)
Responsibility area Geschäftsbereich Planung, Technik und Umwelt, Abteilung Stadtplanung (lead) and Abteilung Stadtklimatologie und Umwelt, jointly with LINZ AG	Transformation potential Transformative / very ambitious climate policy development path

Measure No. 18

Investigation of carbon capture and utilisation (CCU) technologies for power stations

Major climate change mitigation levers

Defossilisation of the energy system with renewable energies (incl. grid expansion); sector coupling and energy and material transfer between sectors

Description of the measure

In some areas, it is not technically possible to completely eliminate total GHG emissions, such as in cement production, waste recycling, or combined heat and power plants. In order to decarbonise, the carbon dioxide contained in the flue gases must be technically separated (carbon capture) and reused in a purposeful manner (utilisation). The captured carbon can be a valuable resource in a climate neutral circular economy in Linz in the future. However, this will require a purpose-built infrastructure for its transport and storage. In addition, a prerequisite for CCU will be the availability of renewable hydrogen, oxygen and nitrogen. In the first step, the potential and possible uses of CCU in Linz should be investigated, with a focus on power plants. For future applications, it should be considered that CCU technologies are very energy-intensive, which will require the industrial use of waste heat and the expansion of renewable energies. A corresponding research should, therefore, be carried out in the near future.

GHG savings potential Cannot be determined	Co-benefits Synergies with circular economy measures
Time of GHG reduction GHG reduction at a later stage	Social impact Cannot be determined
Competence area City of Linz	Cooperations Energieinstitut at the Johannes Kepler University; Linz companies; Climate Lab Wien
Responsibility area Geschäftsbereich Büro Stadtregierung Linz, Abteilung Wirtschaft, Innovation, Klimaschutz und EU (lead), jointly with LINZ AG	Transformation potential Incremental / little ambitious climate policy development path

Measure No. 19

Storage of electricity and heat from renewable energies to compensate for seasonal and short-term fluctuations

Major climate change mitigation levers

Defossilisation of the energy system with renewable energies (incl. grid expansion); storage of renewable energies

Description of the measure

Austrian energy demand (electricity and heat) is largely opposite to energy generation. With the expansion of renewable energies, significantly more energy than is required will be generated during the summer months, whereas the demand in winter cannot be fully met. In order to fully decarbonise the energy sector, Linz will require short-term and long-term storage facilities. Regarding heat, investments must be made in large storage systems (latent, thermal and sensible storage). Electrical energy can only be stored in batteries for a short time; long-term (seasonal) storage will require the construction of chemical storage facilities (e.g. hydrogen electrolysis + re-conversion, underground gas storage). When building storage facilities, sector coupling (interconnected energy) opportunities should be identified as part of an upstream location analysis (waste heat, oxygen as a by-product). For a transformation of the energy sector, it is vital that the production capacity is not only viewed in general terms (averaged over the year) but also for shorter (continuous) periods.

GHG savings potential Cannot be determined	Co-benefits Enhanced security of supply; contribution to grid stabilisation
Time of GHG reduction Cannot be determined	Social impact Cannot be determined
Competence area City of Linz	Cooperations RAG Austria AG; Energieinstitut at the Johannes Kepler University, and others
Responsibility area LINZ AG	Transformation potential Reformative / relatively ambitious climate policy development path

Measure No. 20

Promotion of energy consultation for private individuals, companies and associations

Major climate change mitigation levers

Energy efficiency for further reduction of the total energy requirement; energy sufficiency for further reduction of the total energy requirement; promotion of climate-friendly lifestyles

Description of the measure

The City of Linz promotes comprehensive energy consultations for objects within the urban area. This includes measures aimed at saving energy. The area of living especially offers great potential for reducing direct and indirect GHG emissions by renovating and upgrading dwellings or saving electricity. The combination of various consultation approaches (consulting visits and digital platforms) may contribute to increasing the awareness of energy savings among private individuals, companies, and associations and promote behavioural changes towards sustainable energy use. It is, therefore, vital to continue and possibly even expand subsidies provided by the City of Linz for comprehensive energy consultation. The Geschäftsbereich Finanzen is requested to provide the necessary funds.

GHG savings potential Cannot be determined	Co-benefits Reduction of energy costs
Time of GHG reduction Cannot be determined	Social impact Cannot be determined
Competence area City of Linz	Cooperations None
Responsibility area Geschäftsbereich Planung, Technik und Umwelt, Abteilung Stadtklimatologie und Umwelt (lead), jointly with the Geschäftsbereich Finanzen	Transformation potential Incremental / little ambitious climate policy development path

Activity area: buildings

Measure No. 21

Development of climate neutral neighbourhoods in the Linz urban area

Major climate change mitigation levers

Climate neutral urban development and urban planning; lifecycle analysis in construction; building refurbishment and optimisation; citizen participation and a socially just climate policy; energy efficiency for further reduction of the total energy requirement; promotion of soft mobility forms

Description of the measure

While there is no standardised definition of climate neutral neighbourhoods, key characteristics would include several interconnected energy-efficient building complexes that produce, store or redistribute any excess of renewable energy and that do not emit any GHG emissions (net zero). In a climate neutral neighbourhood, general climate targets are linked to other important development goals of the district, including a green infrastructure, access to soft mobility or mixed use of different forms of living and working as well as measures to support climate change adaptation. As part of the *Linz mit Ambitio3xn* project, the City of Linz is developing large parts of the Franckviertel into a climate neutral neighbourhood. Focus areas include the elimination of the gas infrastructure, a mix of cycling and walking, the expansion of public transport and measures to support climate change adaptation and urban climate improvement. The district will undergo energetic optimisation accompanied by energy and GHG monitoring. The project is to serve as a scaling model for other parts of the city and makes provision for responsible and socially just citizen participation.

GHG savings potential

Medium savings potential: Total effect > 1 % to 3 %

Time of GHG reduction

GHG reduction already at the beginning of the measure

Competence area

City of Linz; State of Upper Austria

Responsibility area

Geschäftsbereich Planung, Technik und Umwelt, Direktion (lead) jointly with the Abteilung Stadtplanung, Abteilung Stadtklimatologie und Umwelt, Abteilung Mobilitätsplanung, Abteilung Bautechnik, LINZ AG as well as the Gemeinnützige Wohnungsgesellschaft of Stadt Linz GmbH

Co-benefits

Improvement in quality of life; costs of not acting are avoided (in the medium and long term); synergies with climate change adaptation measures

Social impact

Social compensatory measures must be taken as a disproportionate social impact can be expected when the measures are implemented

Cooperations

Construction industry; real estate developers; klimaaktiv; Österreichische Energieagentur – Austrian Energy Agency; Austrian Institute of Technology (AIT); other cities in Austria

Transformation potential

Reformative / relatively ambitious climate policy development path

Measure No. 22

Non-profit residential and urban development according to the lowest energy standard and climate neutrality standards

Major climate change mitigation levers

Climate neutral urban development and urban planning; lifecycle analysis in construction; energy efficiency for further reduction of the total energy requirement; energy sufficiency for further reduction of the total energy requirement

Description of the measure

Sustainable urban planning should strive to ensure that all population groups have access to a climate-friendly housing infrastructure and should plan living spaces in a socially equitable manner. Effective defossilisation of existing non-profit housing can be achieved by reducing energy requirements and providing renewable energy (e.g., heating conversions or defossilisation of district heating). For new buildings, the minimum technical requirements for a nearly zero-energy building, according to Article 2, Number 2 of Directive 2010/31/EU, as well as the requirements of the EU Building Directive must be met. In addition, certified ecological and recyclable construction products while reducing the use of steel and concrete are advised. Guidelines can be taken from the “klimaaktiv active Gebäudestandard” issued by the BMK and the interpretive document for the development of an OIB guideline 7 for sustainable use of natural resources by the Austrian Institute of Construction Engineering (OIB). The construction of new buildings should be avoided, where possible, or new buildings should be built as energy-efficiently as possible. All non-profit and public housing developers in the greater Linz area are asked to pursue appropriate standards so as to permit climate-friendly living.

GHG savings potential

Medium savings potential: Total effect > 1 % to 3 %

Time of GHG reduction

GHG reduction only at a later stage

Competence area

City of Linz; State of Upper Austria

Responsibility area

Gemeinnützige Wohnungsgesellschaft der Stadt Linz GmbH, jointly with the Geschäftsbereich Planung, Technik und Umwelt, Abteilung Stadtplanung

Co-benefits

Improvement in quality of life; costs of not acting are avoided (in the medium and long term); synergies with climate change adaptation measures

Social impact

Social compensatory measures must be taken as a disproportionate social impact can be expected when the measures are implemented

Cooperations

Construction industry; real estate developers; klimaaktiv; Österreichisches Institut für Bautechnik (Austrian Institute of Construction Engineering); other cities in Austria and in the European Union

Transformation potential

Transformative / very ambitious climate policy development path Entwicklungspfad

Measure No. 23

Thermal-energetic refurbishment of existing buildings

Major climate change mitigation levers

Climate neutral urban development and urban planning; lifecycle analysis in construction; energy efficiency for further reduction of the total energy requirement

Description of the measure

The majority of the buildings that people will live in and use in the City of Linz by 2040 have already been constructed. As part of necessary modernisation measures, thermal-energetic refurbishment is almost always economical. Thermal refurbishment of buildings dating back to the *Gründerzeit* or decorative facades will involve an increased effort. A concerted campaign for the refurbishment of public buildings will include measures such as thermal insulation of external walls, insulation of basement and floor ceilings, upgrade of windows and external doors, ventilation systems for heat recovery, etc. Sustainable implementations should be based on the *klimaaktiv* building standard and sustainability-related OIB guidelines. An annual refurbish-ment rate using the alternative approach of at least 3 % should be aimed for in public buildings and should be reviewed annually.

GHG savings potential

Low savings potential: Total effect < 1 %

Time of GHG reduction

GHG reduction already at the beginning of the measure

Competence area

City of Linz; State of Upper Austria; Republic of Austria

Responsibility area

Gemeinnützige Wohnungsgesellschaft der Stadt Linz GmbH (lead for non-profit housing construction), jointly with Immobilien Linz GmbH (lead for thermal refurbishment of old buildings) as well as the Geschäftsbereich Gebäude-management und Tiefbau (lead for maintenance)

Co-benefits

Improvement of air quality; improvement of living comfort; lower heating costs in winter; contribution to grid stabilisation

Social impact

Social compensatory measures must be taken as a disproportionate social impact can be expected when the measures are implemented

Citizen participation

Comprehensive refurbishment implementation is recommended

Cooperations

Construction industry; klimaaktiv; Österreichisches Institut für Bautechnik (Austrian Institute of Construction Engineering)

Transformation potential

Transformative / very ambitious climate policy development path

Measure No. 24

Compaction of existing buildings

Major climate change mitigation levers

Reduction of surface area and soil utilisation in construction

Description of the measure

Die behutsame Nachverdichtung im städtebaulichen Bestand (z. B. durch die Überbauung von Parkplatz-flächen, die Aufstockung bestehender Gebäude und an ausgewählten Stellen auch durch die Errichtung von profilüberschreitenden Gebäuden) ermöglicht bei einer steigenden Anzahl von Einwohner*innen, sparsam mit der Ressource Boden umzugehen und dabei Wohnfläche zu schaffen. Bei der Nachverdichtung sollen Niedrig-energiestandards bzw. klimaneutralitätsbezogene Standards eingehalten werden. Hierfür ist insbesondere eine Überarbeitung der Wohnbauförderrichtlinien des Landes Oberösterreich erforderlich. Mögliche Auswirkungen des Hochhausbaus auf das Linzer Stadtklima müssen durch stadtklimatologische Stellungnahmen abgeschätzt und durch geeignete Maßnahmen soweit wie möglich vermieden und kompensiert werden, um etwaigen stadt-klimatologischen Verschlechterungen vorzubeugen.

GHG savings potential

Cannot be determined

Time of GHG reduction

Cannot be determined

Competence area

City of Linz

Responsibility area

Geschäftsbereich Planung, Technik und Umwelt (lead), Abteilung Bautechnik, Abteilung Stadt-planung, Abteilung Stadtklimatologie und Umwelt, jointly with the Geschäftsbereich Bau- und Bezirksverwaltung

Co-benefits

Creation of urban density

Social impact

Social compensatory measures must be taken as a disproportionate social impact can be expected when the measures are implemented (Acceptance of compaction is often low; early involvement of the affected parties into the planning and decision-making processes is therefore required)

Cooperations

Construction industry; real estate developers

Transformation potential

Reformative / relatively ambitious climate policy development path

Measure No. 25

Construction of buildings / structures using CO₂-optimised construction methods (hybrid construction, timber construction, etc.) and use of circular building products

Major climate change mitigation levers

Lifecycle analysis in construction; increased potential for carbon sequestration in the urban area

Description of the measure

GHG emissions in buildings/structures can be reduced by the use of hybrid construction methods that combine different building materials and wood construction methods, taking the entire lifecycle of building products and the embodied energy into account. In principle, it is possible to safely store carbon in the building structure over the long term (decades to centuries). Nevertheless, storing large amounts of carbon in urban wooden buildings only makes sense if agriculture and forests are also managed sustainably. At present, the origin of wood products and the sustainability of how they are managed need to be critically examined. Flagship projects in timber construction and sustainability in the City of Linz, such as “Wohnen am Weidingerbach” initiated by the GWG, should be intensified across the Linz urban area. The EU Energy Performance of Buildings Directive (EPBD) regulates the construction of CO₂-optimised buildings and the construction of net-zero emissions buildings in consideration of operation-related and embodied GHG emissions. The EU Taxonomy Regulation also considers GHG emissions over the entire lifecycle and makes the transition to a circular economy mandatory in the construction and real estate sector. Recyclable and CO₂-optimised building products should, therefore, gradually become standard in the direct and extended sphere of influence of the City of Linz, and their use should be pushed for renovations or constructions of all buildings. Standards for climate neutrality should already be observed during product selection for building. The *klimaaktiv* building assessment system, which excludes building materials that are harmful to the climate or hazardous to health (HFC-containing insulation materials, PVC in flooring and other halogenated organic compounds) can provide guidelines in this regard. From a climate change mitigation perspective, ecologically optimised building products and constructions with eco-indicators, which are easy to dismantle and to recycle, should preferably be used. Examples of renewable biological building products include wood, bamboo, lignocellulose or other biomass products. As part of the city’s project *Linz mit Ambitio3xn*, ways to improve the general economic conditions that are currently largely oriented towards housing subsidies offered by the State of Upper Austria, should be combined with the implementation of this measure in non-profit housing.

GHG savings potential Cannot be determined	Social impact Social compensatory measures must be taken as a disproportionate social impact can be expected when the measures are implemented
Time of GHG reduction GHG reduction already at the beginning of the measure	Bürger:innenbeteiligung It is recommended that the use of sustainable materials for building refurbishments and new constructions be made compulsory.
Competence area City of Linz; State of Upper Austria	Cooperations Construction industry; real estate developers; Bauhaus initiative; klimaaktiv; Holzforschung Austria – Österreichische Gesellschaft für Holzforschung (Austrian Forest Products Research Society); City of Vienna
Responsibility area Immobilien Linz GmbH jointly with Gemeinnützige Wohnungsgesellschaft der Stadt Linz GmbH as well as the Geschäftsbereich Planung, Technik und Umwelt	Transformation potential Reformative / relatively ambitious climate policy development path
Co-benefits Improvement in quality of life; promotion of a circular economy	

Measure No. 26

Activation of brownfield sites and vacancy management with a focus on trade

Major climate change mitigation levers Climate neutral urban development and urban planning; reduction of the surface area and soil utilisation in construction	
Description of the measure Optimal use of commercial brownfield sites and business premises in the City of Linz will avoid the need for new construction. This will result in savings of embodied and direct GHG emissions and will contribute to soil conservation. Any effective vacancy management will require a survey of brownfield sites and vacant properties and the development of an urban concept for the creative and climate-friendly activation of these areas and objects. The activation of commercial vacancies should be considered an opportunity for a climate neutral urban and economic development.	
GHG savings potential Cannot be determined	Co-benefits Mobilisation of building land
Time of GHG reduction GHG reduction already at the beginning of the measure	Social impact Cannot be determined
Competence area City of Linz; State of Upper Austria	Citizen participation Better utilisation of vacant premises is recommended
Responsibility area Geschäftsbereich Planung, Technik und Umwelt (lead), jointly with the Geschäftsbereich Büro Stadtregierung Linz, Abteilung Wirtschaft, Innovation, Klimaschutz und EU	Cooperations State of Upper Austria; Österreichische Gesellschaft für Nachhaltige Immobilienwirtschaft; Chamber of Commerce of Upper Austria
	Transformation potential Transformative / very ambitious climate policy development path

Measure No. 27

Consultation with the State of Upper Austria on increasing the Upper Austrian housing subsidies and the consideration of climate neutrality targets in the subsidy guidelines

Major climate change mitigation levers Climate finance and diversion of capital flows	
Description of the measure Against the background of the refurbishment requirements and the goal of climate neutrality by 2040, a revision of the housing subsidies provided by the State of Upper Austria is crucial. The current funding guidelines for new constructions do not cover the construction of energetically ambitious or climate neutral buildings and neighbourhoods and, therefore, need to be revised. Refurbishment subsidies offered by the State of Upper Austria currently clearly prioritise new replacement buildings over the maintenance of existing buildings. In the future, decisions on granting subsidies should be made based on lifecycle analysis and considering climate change mitigation targets, including embodied energy.	
GHG savings potential Cannot be determined	Co-benefits Promotion of cooperation between the State of Upper Austria in climate change mitigation and climate change adaptation
Time of GHG reduction Cannot be determined	Social impact Cannot be determined
Competence area State of Upper Austria	Cooperations State of Upper Austria; Österreichischer Verband gemeinnütziger Bauvereinigungen – Revisionsverband (Austrian Limited-Profit Housing Associations)
Responsibility area Gemeinnützige Wohnungsgesellschaft der City of Linz GmbH	Transformation potential Reformative / relatively ambitious climate policy development path

Activity area: transport / mobility

Measure No. 28

Expansion, densification and acceleration of public transport

Major climate change mitigation levers

Promotion of soft mobility forms

Description of the measure

According to the urban mobility concept 2021, Linz’s public transport services to settlement areas are incomplete, resulting in significant motor vehicle use in source and destination traffic. At the same time, the public transport infrastructure is at its capacity limit in some areas during peak hours. The expansion of the public transport system is, therefore, crucial and requires comprehensive implementation measures. For example, to convince commuters to use public transport instead of their private vehicles, the frequency and quality of public transport outside of peak times, especially in regional transport across city borders, should be improved. Specifically, it requires an optimally coordinated public transport network comprising regional trains, S-Bahn, regional buses, trams and city buses; these fall within the competence area of the public transport coordinator. For settlement areas with inadequate public transport access, bike & ride and park & ride offerings need to be improved. The City of Linz needs to optimise processes for changing between different public transport lines sharing offers (bicycles, e-scooters, e-cargo bikes, car sharing). In addition, appropriate high-quality facilities and equipment (passenger information, weather protection, waiting areas, etc.) should be offered at all mobility hubs to complement the existing offer. The City of Linz can contribute to a positive customer experience by expanding bus lanes in areas of stationary traffic during the day or during peak hours or by expanding priority right of way for public transport at traffic lights. Large new residential and business areas should be constructed according to public transport quality classes A-C, while public transport in underserved settlement areas should be improved. A generally better connection is to be achieved by the implementation of the second north-south public transport axis, which will also connect the eastern parts of Linz, thus reducing traffic on the country road and at the main train station. New bus lines, including bus lines 13, 14 and trolleybus lines 47/48, will also improve the public transport network in Linz. The Linz Regional Stadtbahn project – a centennial project that will serve an estimated number of more than 40,000 passengers per working day – will also contribute significantly to achieving climate change mitigation goals.

GHG savings potential

Medium savings potential: Total effect > 1 % to 3 %

Time of GHG reduction

GHG reduction already at the beginning of the measure

Competence area

City of Linz

Responsibility area

Geschäftsbereich Planung, Technik und Umwelt, Abteilung Mobilitätsplanung (strategic lead), jointly with LINZ AG (operational lead)

Co-benefits

Improved air quality; noise reduction; increased road safety; improvement in quality of life

Social impact

Cannot be determined

Citizen participation

It is recommended to adapt tariffs for low-income groups and to convert means of public transport to climate-friendly drive types

Cooperations

State of Upper Austria

Transformation potential

Transformative / very ambitious climate policy development path

Measure No. 29

Expansion of the charging infrastructure for electric vehicles available to the public

Major climate change mitigation levers

Technological change of vehicles towards climate-friendly drive types and provision of the required infrastructure; transformation of transport infrastructure and areas

Description of the measure

LINZ AG is the largest operator of e-vehicle charging stations in Upper Austria and has actively worked on expanding the necessary infrastructure since 2008. Thanks to this early engagement, more than 700 charging points, which are largely publicly accessible, and attractive charging systems are currently available for private individuals, companies and housing construction. In the 2022 calendar year, 1.9 GWh of electricity was supplied for e-vehicle at the LINZ AG charging stations. This means that, thanks to the constructed charging infrastructure, approx. 9.5 million passenger car kilometres were driven without the need for fossil fuels. This is equivalent to an increase of 170 % compared to the 2021 calendar year, which demonstrates the effectiveness of the investment. A further expansion of the publicly accessible e-charging infrastructure in the City of Linz and its surrounding towns is planned as, already today, electric cars generate significantly less CO₂ emissions compared to petrol and diesel vehicles. The City of Linz is to provide the areas required for this purpose.

GHG savings potential

Medium savings potential: Total effect > 1 % to 3 %

Time of GHG reduction

GHG reduction at a later stage

Competence area

City of Linz

Responsibility area

LINZ AG

Co-benefits

Improvement of air quality; noise reduction

Social impact

Social compensatory measures must be taken as a disproportionate social impact can be expected when the measures are implemented

Cooperations

Companies in Linz

Transformation potential

Reformative / relatively ambitious climate policy development path

Measure No. 30

Increased public funding for the charging infrastructure for electric vehicles

Major climate change mitigation levers

Technological change of vehicles towards climate-friendly drive types and provision of the required infrastructure; transformation of transport infrastructure and areas

Description of the measure

In recent years, environmental funding provided by the city has been expanded continuously. Current priorities include, among others, funding of the charging infrastructure for electric cars at multi-story residential buildings. These subsidies are primarily intended to support the necessary investments in existing buildings to create the necessary basic infrastructure to ensure that the switch to environmentally friendly e-mobility is affordable for residents in multi-storey residential buildings. Owners, owners’ associations or tenants/tenant associations in multi-storey residential buildings can apply for funding. The Geschäftsbereich Planung, Technik

und Umwelt will provide information on available funding provided by the city. The Geschäftsbereich Finanzen is requested to provide the necessary funds.

GHG savings potential

Low savings potential: Total effect < 1 %

Time of GHG reduction

GHG reduction at a later stage

Competence area

City of Linz

Responsibility area

Geschäftsbereich Planung, Technik und Umwelt, Abteilung Stadtklimatologie und Umwelt, jointly with the Geschäftsbereich Finanzen

Co-benefits

Improvement of air quality; noise reduction

Social impact

Social compensatory measures must be taken as a disproportionate social impact can be expected when the measures are implemented

Cooperations

Real estate developers; companies in Linz

Transformation potential

Reformative / relatively ambitious climate policy development path

Measure No. 31

Expansion and improvement of the inner-city bicycle path infrastructure

Major climate change mitigation levers

Promotion of soft mobility forms; transformation of transport infrastructure and areas

Description of the measure

Linz’s bicycle traffic is expected to increase by around 40 % by 2040. Large parts of the cycling infrastructure no longer meet today’s requirements. Due to narrow bicycle paths, complicated routing at intersections, traffic light switching that is optimised for motor vehicles and poor driving comfort along main roads, Linz does not provide the cycling quality it aims for. In addition, streets in Linz lack the necessary continuity to be attractive and safe for cyclists. It is therefore necessary to expand the capacity of the bicycle transport installations (bicycle paths, bike racks) and to improve the existing bicycle transport installations. As part of the expansion of inner-city bicycle paths, plans provide for a network of main routes to be supplemented by connecting routes. Where necessary, public roads are to be re-divided to favour cycling so that new cycling areas can be constructed. The bicycle path infrastructure is to be improved so that it offers all cyclists adequate comfort and safety. Any and all danger areas and barriers should be removed.

GHG savings potential

Low savings potential: Total effect < 1 %

Time of GHG reduction

GHG reduction already at the beginning of the measure

Competence area

City of Linz

Responsibility area

Geschäftsbereich Planung, Technik und Umwelt, Abteilung Mobilitätsplanung (lead), jointly with the Geschäftsbereich Stadtgrün und Straßenbetreuung

Co-benefits

Improvement of air quality; noise reduction; synergies with climate change adaptation measures

Social impact

Cannot be determined

Citizen participation

It is recommended that bicycle paths be structurally separated from other transport lanes. Rental offers should be expanded throughout the city and covered bicycle parking areas with integrated lockers/storage facilities are required

Cooperations

Linz bicycle lobby

Transformation potential

Transformative / very ambitious climate policy development path

Measure No. 32

Improvement of the pedestrian infrastructure and promotion of pedestrian traffic

Major climate change mitigation levers

Promotion of soft mobility forms; transformation of transport infrastructure and areas

Description of the measure

In order to convince the population of Linz to make more trips on foot, pedestrian traffic infrastructure will need to be improved significantly by 2040. In addition, projects and awareness-raising measures to promote walking should be initiated. The provision of a comfortable, safe and barrier-free city-wide infrastructure for pedestrians is not only important for demographic reasons but is also an essential part of making public transport more attractive. Improvements for pedestrian traffic will be achieved through a variety of small measures that must be implemented gradually as part of road refurbishment, new road construction and traffic organisation measures. Examples include compliance with minimum sidewalk widths, safe road crossing options, seating, greening measures and the introduction of new pedestrian zones, etc.

GHG savings potential

Low savings potential: Total effect < 1 %

Time of GHG reduction

GHG reduction already at the beginning of the measure

Competence area

City of Linz

Responsibility area

Geschäftsbereich Planung, Technik und Umwelt, Abteilung Mobilitätsplanung (lead), jointly with the Geschäftsbereich Stadtgrün und Straßenbetreuung

Co-benefits

Improvement of air quality; noise reduction; synergies with climate change adaptation measures

Social impact

Cannot be determined

Cooperations

Klimabündnis Oberösterreich; dieziwi. – Die Zivilgesellschaft wirkt.

Transformation potential

Transformative / very ambitious climate policy envelopment path

Measure No. 33

Changes of the modal split in favour of soft mobility through regulations and incentives (push & pull)

Major climate change mitigation levers

Avoidance of motorised private transport

Description of the measure

According to the city’s 2021 urban mobility concept, the high proportion of private motor vehicles in source and

destination traffic leads to high levels of fine dust and emissions within the city and outside the city borders. Linz’s road network can no longer cope with any additional motorised private transport (MTV) demand. Key measures to address this problem include the expansion of the public transport system and the bicycle path network across city borders. At the same time, the mandatory reduction of the speed limit (30 km/h), shared zones, speed controls and structural measures are intended to reduce the use of private motor vehicles.

GHG savings potential Cannot be determined	Social impact Cannot be determined
Time of GHG reduction GHG reduction already at the beginning of the measure	Citizen participation It is recommended to reduce the speed limit and to expand and increase the visibility of bicycle repair stations
Competence area City of Linz	Cooperations State of Upper Austria
Responsibility area Geschäftsbereich Planung, Technik und Umwelt, Abteilung Mobilitätsplanung	Transformation potential Transformative / very ambitious climate policy development path
Co-benefits Improved air quality; noise reduction; increased road safety	

Measure No. 34

Parking space management

Major climate change mitigation levers

Avoidance of motorised private transport; transformation of transport infrastructure and areas

Description of the measure

The parking management system introduced in Linz in 1989 covers the entire city centre and the adjacent districts. Long-term parking spaces are available to resident parking card holders. Short-term parking zones on commercial streets are excluded. In view of the growing number of commuters travelling by car, the 2021 mobility concept makes provision for a possible expansion of the parking space management zones and a review of an extension into the evening hours. According to the “*klimaaktiv* Leitfaden”, it is recommended that parking space requirement should always be addressed in connection with the overall transport infrastructure; the city should move away from minimum and towards upper limits for car parking spaces. Car parking spaces for buildings not used residentially cause traffic and are therefore undesirable and should be restricted by upper limits. The construction ordinance issued by the State of Upper Austria provides the legal framework for climate-friendly parking space management in the City of Linz. The State of Upper Austria should adapt this legal framework against the background of the shared mobility-related climate change mitigation targets. An intensified evaluation of parking space management in terms of space and time should be reviewed, and the federal state should create a legal basis for regulating green parking zones.

GHG savings potential Cannot be determined	Responsibility area Geschäftsbereich Planung, Technik und Umwelt, Abteilung Mobilitätsplanung (lead) and Geschäftsbereich Bau- und Bezirksverwaltung
Time of GHG reduction Cannot be determined	Co-benefits Increased road safety
Competence area City of Linz; State of Upper Austria	

Social impact

Social compensatory measures must be taken as a disproportionate social impact can be expected when the measures are implemented

Citizen participation

It is recommended to reduce the number of parking spaces, to use available parking areas for soft mobility forms and to increase parking tariffs for large private vehicles

Measure No. 35

Expansion and new construction of infrastructure for Bike & Ride and Park & Ride at public transport hubs

Major climate change mitigation levers

Avoidance of motorised private transport; promotion of soft mobility forms; transformation of transport infrastructure and areas

Description of the measure

With 109,220 commuters daily, Linz is the largest commuter centre among Austrian state capitals. On the other hand, 33,343 working inhabitants of Linz presently work outside Linz (as in 2021). According to the mobility concept, Park & Ride and Bike & Ride services in public transport should be expanded significantly, particularly in transport corridors across city borders, to reduce car traffic. This will create incentives for people to use a variety of means of transport when commuting (work, training, etc.). Specifically, Bike & Ride (priority) and Park & Ride (secondary) facilities are to be expanded or newly built at train, tram and bus stops of public transport hubs and in the adjacent settlement areas along the main transport axes. Emergency telephones and adequate illumination can ensure greater safety for vulnerable groups (women, children, the elderly, people with disabilities).

GHG savings potential Low savings potential: Total effect < 1 %	Co-benefits Improvement of air quality; noise reduction
Time of GHG reduction GHG reduction already at the beginning of the measure	Social impact Cannot be determined
Competence area State of Upper Austria	Cooperations Regionalmanagement OÖ GmbH; State of Upper Austria, Gesamtverkehrsplanung; Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology
Responsibility area Geschäftsbereich Planung, Technik und Umwelt, Abteilung Mobilitätsplanung (lead)	Transformation potential Reformative / relatively ambitious climate policy development path

Measure No. 36

Expansion of restricted traffic zones

Major climate change mitigation levers

Avoidance of motorised private transport; promotion of soft mobility forms; transformation of transport infrastructure and areas

Description of the measure

The City of Linz is planning a car-free main square for 2024. From a climate change mitigation perspective, additional restricted traffic zones should be established. This measure offers numerous co-benefits, including the freeing up of areas for unsealing and greening. As has been shown by best practice examples, such as Ljubljana, Amsterdam and Barcelona, restricted traffic zones in a city increase the quality of life and length of stay, which can also benefit retailers and restaurants. Public locker facilities for temporarily storing purchases could be created so that it is not necessary to use cars for storage. Vulnerable groups and the majority of suppliers should be excluded from this measure.

GHG savings potential

Low savings potential: Total effect < 1 %

Social impact

Cannot be determined

Time of GHG reduction

GHG reduction already at the beginning of the measure

Citizen participation

It is recommended that access options of suppliers and emergency vehicles to restricted traffic zones should not be restricted.

Competence area

City of Linz

Responsibility area

Geschäftsbereich Planung, Technik und Umwelt, Abteilung Mobilitätsplanung and Abteilung Stadtplanung

Co-benefits

Improvement of air quality; noise reduction; synergies with climate change adaptation measures

Measure No. 37

Expansion of a bicycle highway network to Linz and surroundings

Major climate change mitigation levers

Promotion of soft mobility forms

Description of the measure

The main cycling routes in Linz extend up to the city borders, which connect to the main cycling route network of Upper Austria. If these main routes are improved in close coordination with the surrounding towns and the state of Upper Austria, an attractive cycling network will be available to cyclists commuting to and from Linz. Concrete implementation projects for this are already planned as part of the Linz bicycle strategy.

GHG savings potential

Low savings potential: Total effect <1 %

Co-benefits

Improvement of air quality; noise reduction

Time of GHG reduction

GHG reduction already at the beginning of the measure

Social impact

Cannot be determined

Competence area

City of Linz; State of Upper Austria

Cooperations

State of Upper Austria; surrounding towns

Responsibility area

Geschäftsbereich Planung, Technik und Umwelt, Abteilung Mobilitätsplanung (lead) and Geschäftsbereich Stadtgrün und Straßenbetreuung

Transformation potential

Transformative / very ambitious climate policy development path

Measure No. 38

Expansion of e-car sharing services

Major climate change mitigation levers

Technological change of vehicles towards climate-friendly drive types and provision of the required infrastructure

Description of the measure

Trams and buses are essential tools for decarbonising transport. Nevertheless, further alternatives to individual mobility are needed. So-called multimodal mobility hubs represent a very purposeful concept. At these hubs, public transport is combined with individual mobility (e-car sharing options) and soft mobility (bicycle parking areas) to achieve a sustainable mixed form of mobility. Since the introduction of *tim* in September 2019, LINZ AG LINIEN has built and operated this type of mobility hub. In the last four years, eleven e-car-sharing locations have been built in Linz and one in Leonding. With two million kilometres travelled, the usage figures are positive; two-thirds of all *tim* travels were made using electric vehicles. As this innovative mobility service appeals to almost all age groups (from 18 to 85 years) and contributes to climate change mitigation, *tim* should be expanded and could also be made a fixed component in (non-profit) housing.

GHG savings potential

Low savings potential: Total effect < 1 %

Social impact

Cannot be determined

Time of GHG reduction

GHG reduction already at the beginning of the measure

Citizen participation

It is recommended to expand this measure.

Competence area

City of Linz

Cooperations

Bundesverband Elektromobilität Österreich (Austrian Federal Association for Electric Mobility); State of Upper Austria; Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology

Responsibility area

LINZ AG

Co-benefits

Improvement of air quality; noise reduction

Transformation potential

Reformative / relatively ambitious climate policy development path

Measure No. 39

Expansion of the shore-side power supply for Danube shipping

Major climate change mitigation levers

Technological change of vehicles towards climate-friendly drive types and provision of the required infrastructure

Description of the measure

The energy requirement of a docked Danube cruise ship is comparable to the power needed to operate a full hotel. The use of diesel generators for cruise ships docked on the “Donaulände” for several hours to several days causes GHG emissions and other air pollutants (e.g. fine dust). Shore-side power supply for the cabin ships, on the other hand, will lower GHG emissions and also significantly reduce noise emissions, especially during the night. The supply systems will be commissioned in March 2024, and it is expected that a total of seven systems will be fully operational in the Linz urban area by 2025. In addition to the construction of energy terminals, the shore-side supply of the cabin ships will also require the construction of appropriate transformer stations near the piers. Five transformer stations will be needed and built in Linz. Shore-side power supply connections are already available in the Linz harbour for ships to use during winter. Plans provide for an expansion of the shore-side power supply offering in the next few years.

GHG savings potential

Low savings potential: Total effect < 1 %

Time of GHG reduction

GHG reduction already at the beginning of the measure

Competence area

City of Linz

Responsibility area

LINZ AG

Co-benefits

Improvement of air quality; noise reduction

Social impact

Cannot be determined

Citizen participation

It is recommended to move cruise ships to the harbour and to implement stricter waste disposal controls.

Cooperations

State of Upper Austria; European Union

Transformation potential

Reformative / relatively ambitious climate policy development path

Measure No. 40

Electrification of the municipal vehicle fleet, including the implementation of operational mobility management with a clear focus on climate change mitigation

Major climate change mitigation levers

Technological change of vehicles towards climate-friendly drive types and provision of the required infrastructure

Description of the measure

According to the *Linz Climate Strategy 2019*, the entire vehicle fleet of the Corporate Group of the City of Linz is to convert to electromobility. Cars were regarded as a priority. In addition, the entire vehicle fleet – comprising passenger and commercial vehicles – of the Linz City Administration should also be decarbonised. Implementing this climate change mitigation-relevant measure will require a fundamental decision on the part of the City Council of the City of Linz to provide an additional budget, taking funds available from the Federal Government into account, to absorb any additional costs. The introduction of mobility management for the Corporate Group aims to promote active and climate-friendly mobility among employees, providing additional health benefits. It is planned to submit corresponding offers to the Linz City Administration.

GHG savings potential

Low savings potential: Total effect < 1 %

Time of GHG reduction

GHG reduction already at the beginning of the measure

Competence area

City of Linz

Responsibility area

Geschäftsbereich Stadtgrün und Straßenbetreuung, Abteilung Logistik und Technik (lead for the electrification of the City Government’s vehicle fleet), jointly with the Geschäftsbereich Personal und Zentrale Services (lead for the operational mobility management of the City Government), UGL companies with their own vehicle fleet (lead for the electrification of the vehicle fleet and the operational mobility management at the respective company); LINZ AG (lead for the associated charging infrastructure)

Co-benefits

Improvement of air quality; noise reduction, additional health benefit

Social impact

Cannot be determined

Cooperations

State of Upper Austria; VCÖ – Mobilität mit Zukunft

Transformation potential

Reformative / relatively ambitious climate policy development path

Measure No. 41

Establishment of pedestrian and shared zones in all parts of the city

Major climate change mitigation levers

Promotion of soft mobility forms; transformation of transport infrastructure and areas

Description of the measure

According to the city’s 2021 mobility concept, existing pedestrian zones (including shared zones) are to be expanded and new pedestrian zones are to be built. As a result, fewer vehicles will be parked in public spaces, bus lanes will be favoured, bicycle paths and sidewalks will be made wider, and quality pedestrian spaces will be created. When designing pedestrian and shared zones, particular attention must be paid to the shading of surfaces and other aspects related to climate change adaptation. The measure is to be implemented across all districts of the city and will not be restricted to the Linz City Centre.

GHG savings potential

Low savings potential: Total effect < 1 %

Time of GHG reduction

GHG reduction already at the beginning of the measure

Competence area

City of Linz

Responsibility area

Geschäftsbereich Planung, Technik und Umwelt, Abteilung Mobilitätsplanung (lead), jointly with the Abteilung Stadtklimatologie und Umwelt and Abteilung Stadtplanung

Co-benefits

Improved air quality; noise reduction; increased road safety; synergies with climate change adaptation measures

Social impact

Cannot be determined

Citizen participation

It is recommended to create more shared zones

Cooperations

State of Upper Austria; VCÖ – Mobilität mit Zukunft

Transformation potential

Transformative / very ambitious climate policy development path

Activity area: industry und economy

Measure No. 42

Development of a green hydrogen economy in Linz

Major climate change mitigation levers

Transformation of the industry through utilisation of green technologies; promotion of a circular economy at the material level or, respectively, the sustainable use of carbon sources; sector coupling and energy and material transfer between sectors

Description of the measure

Linz’s industry (steel production and chemicals) is the largest emitter of greenhouse gases in the city due to the use of coal and natural gas. The use of renewable or green hydrogen could reduce most of these GHG emissions to reach the goal of defossilisation of Linz’s industry by 2050 at the latest. The City of Linz should actively support the local industry in this transformation and help develop a green hydrogen value chain. Possible ways to achieve this could include the implementation of hydrogen-related pilot projects, the creation of a platform for regular exchange among stakeholders (H2 Convention Oberösterreich und Großraum Linz), subsidies for research and application, the establishment of a suitable hydrogen infrastructure or by raising awareness among citizens. Hydrogen serves as an energy source and as a resource for advanced technologies; it is also an important component of a circular economy in Linz. A full transition of the industry in Linz to renewable hydrogen will require an energy equivalent of around 30 to 40 TWh per year, which is around half of Austria’s current electricity need. A large part of future demand will, therefore, be covered by imports, which the City of Linz should take into account when determining new partnerships with twin cities.

GHG savings potential

High savings potential: Total effect > 3 %

Time of GHG reduction

GHG reduction already at the beginning of the measure

Competence area

City of Linz, jointly with the State of Upper Austria, the Republic of Austria and the European Union

Responsibility area

Geschäftsbereich Büro Stadtregierung Linz, Abteilung Wirtschaft, Innovation, Klimaschutz und EU (lead), jointly with LINZ AG

Co-benefits

Increase of the innovation potential of companies in Linz; creation of new jobs

Social impact

Social compensatory measures must be taken as a disproportionate social impact can be expected when the measures are implemented

Cooperations

Companies in Linz; WIVA P&G – Wasserstoff-initiative Austria Power & Gas, HyPa – Hydrogen Partnership Austria, Business Upper Austria – OÖ Wirtschaftsagentur GmbH

Transformation potential

Reformative / relatively ambitious climate policy development path

Measure No. 43

Creation of an infrastructure for the import of green hydrogen

Major climate change mitigation levers

Transformation of the industry through the utilisation of green technologies

Description of the measure

The conversion of Linz’s industry to renewable or green hydrogen will be subject to the construction of a suitable import infrastructure. According to the plans of major Austrian pipeline operators, green hydrogen in large quantities should be available in Linz by 2030. Consequently, the required facilities for a centralised import and redistribution to Linz companies should be ready by that time. The connection of Linz companies to the distribution infrastructure can be implemented in phases depending on priority, where private households would have secondary priority. Long-term plans should make provision for the construction of a pipeline infrastructure for the distribution of green hydrogen in Linz.

GHG savings potential

Cannot be determined

Time of GHG reduction

GHG reduction only at a later stage

Competence area

City of Linz

Responsibility area

LINZ AG

Co-benefits

Increase of the innovation potential of companies in Linz

Social impact

Cannot be determined

Cooperations

Companies in Linz

Transformation potential

Reformative / relatively ambitious climate policy development path

Measure No. 44

Acceleration and simplification of the official authorisation procedure for climate-friendly key technologies

Major climate change mitigation levers

Transformation of the industry through the utilisation of green technologies

Description of the measure

Official procedures for approvals of climate-friendly key technologies, such as electrolyzers, biomass power plants, etc., are essential in the transformation to a climate neutral industry and economy. The Linz City Administration should organise the approval process for such technologies as efficiently as possible to facilitate an uncomplicated and smooth process and to eliminate unnecessary red tape at an early stage. Any approval of large renewable or green hydrogen projects will be subject to the requirements stipulated in the SEVESO Directive, which will result in significantly more complex zoning. Efficient cooperation between official authorities and the project applicants will also require the corresponding number of human resources.

GHG savings potential

Cannot be determined

Time of GHG reduction

Cannot be determined

Competence area

City of Linz

Responsibility area

Geschäftsbereich Bau- und Bezirksverwaltung (lead), jointly with the Geschäftsbereich Planung, Technik und Umwelt and the Geschäftsbereich Büro Stadtregierung Linz, Abteilung Wirtschaft, Innovation, Klimaschutz und EU

Co-benefits

Increase of the innovation potential of companies in Linz

Social impact

Cannot be determined

Cooperations

State of Upper Austria; Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology

Transformation potential

Incremental / little ambitious climate policy development path

Measure No. 45

Investigation of potential on all levels of the circular economy (secondary raw materials, recyclable products and carbon capture and utilisation) and development of a circular economy in Linz

Major climate change mitigation levers

Promotion of a circular economy at the product level; promotion of a circular economy at the material level or, respectively, the sustainable use of carbon sources

Description of the measure

In line with the Austrian circular economy strategy, the current linear economic system should be redesigned. In the circular economy to be achieved, raw materials will be obtained in an environmentally friendly manner and all goods and products will be manufactured in processes that save resources and produce as little waste as possible. The life of products will be extended as far as possible. Products will be bio-based and biodegradable and, at the end of their useful life, returned to the product cycle in order to preserve their value for as long as possible. Plans for Linz provide for establishing such a circular economy in the medium term. In a first step, the potential of the circular economy in Linz should be investigated from a technical perspective. Possible implementations by the City of Linz include the construction industry and infrastructure as well as waste and secondary raw materials.

GHG savings potential

Medium savings potential: Total effect > 1 % to 3 %

Time of GHG reduction

GHG reduction only at a later stage

Competence area

City of Linz

Responsibility area

Geschäftsbereich Büro Stadtregierung Linz, Abteilung Wirtschaft, Innovation, Klimaschutz und EU (lead) with LINZ AG

Co-benefits

Increase of the innovation potential of companies in Linz; solution of other environmental problems; creation of new jobs

Social impact

Cannot be determined

Cooperations

Johannes Kepler Universität Linz; Climate Lab Wien; Tabakfabrik Linz

Transformation potential

Transformative / very ambitious climate policy development path

Measure No. 46

Climate change mitigation pact between the City of Linz and Linz companies

Major climate change mitigation levers

Elimination of red tape for swift climate change mitigation; establishment of new alliances among politics, administration, economy, science and civil society to push climate change mitigation and climate mainstreaming

Description of the measure

With a gross value added of 29 billion euros, the territorial region of Linz-Wels is the leading economic area in Austria. In addition, twenty-five of the hundred companies with the highest turnover in Upper Austria are based in Linz. As part of a new climate change mitigation pact, interested Linz companies will be able to contribute to the city’s vision to achieve climate neutrality by 2040 at the latest by implementing ambitious climate change mitigation within their own companies. Being part of the Linz climate change mitigation pact will send a clear signal to industry competitors and demonstrate to the public that this company takes the implementation of the global, EU-wide, Austrian and Linz climate targets seriously. Linz companies will benefit from the climate change mitigation network in the City of Linz and can use the climate change mitigation pact for marketing. The climate change mitigation pact will also contribute to a more targeted alignment of economic development programs according to the climate transformation challenges faced by local companies. An implementation concept for the climate change mitigation pact with a focus on Linz companies is to be developed by 2025.

GHG savings potential

Cannot be determined

Time of GHG reduction

Cannot be determined

Competence area

City of Linz

Responsibility area

Geschäftsbereich Büro Stadtregierung Linz, Abteilung Wirtschaft, Innovation, Klimaschutz und EU

Co-benefits

Increase of the innovation potential of companies in Linz

Social impact

Cannot be determined

Cooperations

City of Graz; Climate Lab Wien; Climate Change Centre Austria

Transformation potential

Reformative / relatively ambitious climate policy development path

Activity area: consumption

Measure No. 47

Promotion of vegetarian and vegan, as well as regional and seasonal diets incl. awareness raising

Major climate change mitigation levers

Promotion of climate-friendly lifestyles; reduction of incentives for climate-damaging consumption

Description of the measure

The Austrian food sector accounts for approx. 20–30 % of GHG emissions; meat and animal products cause more harm to the climate than plant-based products. Compared to the average diet, following a lacto-ovo vegetarian diet and following a vegan diet could save almost half or respectively two-thirds of GHG emissions. Clear policies promoting sustainable diet forms are required in order to make synergies between climate change mitigation and health visible. The Geschäftsbereich Gesundheit und Sport is requested to actively highlight the benefits of a sustainable, balanced, regional and seasonal diet as part of the awareness raising programs organised at primary and secondary schools. The existing offer will be evaluated and adapted accordingly. Vegetarian and vegan meals are consistently available in services for children and youth (kindergartens, creches, etc.) and retirement homes in the City of Linz. Retirement homes in Linz, for example, offer one vegetarian / vegan meal per day as an alternative to meat dishes, and there is one meat-free day per week. Aspects of regionalism, short transport distances and sustainability are considered when purchasing groceries. Internal events of the city should also make provision for vegetarian and vegan dish offers. Public events in the City of Linz (e.g., health days for children) and markets should include vegan food stalls and a regional, seasonal food offer.

GHG savings potential

Medium savings potential: Total effect > 1 % to 3 %

Time of GHG reduction

GHG reduction already at the beginning of the measure

Competence area

City of Linz

Responsibility area

Geschäftsbereich Büro Stadtregierung Linz, Abteilung Wirtschaft, Innovation, Klimaschutz und EU (lead), jointly with the Geschäftsbereich Gesundheit und Sport, Unternehmung Kinder- und Jugend-Services, Seniorenzentren Linz GmbH, Geschäftsbereich Gebäudemanagement und Tiefbau, Abteilung Marktmanagement und Tourismus, Volkshochschule Linz, Geschäftsbereich Personal und Zentrale Services, Abteilung Zentraler Einkauf as well as the Geschäftsbereich Planung, Technik und Umwelt, Abteilung Stadtklimatologie und Umwelt

Co-benefits

Improvement in quality of life; reduction of health risks (cardiovascular diseases, Diabetes Mellitus 2, overweight, certain types of cancer); synergy with animal protection measures

Social impact

Cannot be determined

Citizen participation

It is recommended to promote analogous offers in the hospitality sector

Cooperations

Klimabündnis Oberösterreich; hospitality sector in Linz; Südwind OÖ

Transformation potential

Transformative / very ambitious climate policy development path

Measure No. 48

Consumption-free zones in the city centre (indoor and outdoor areas)

Major climate change mitigation levers

Promotion of climate-friendly lifestyles

Description of the measure

Consumption-free zones offer the opportunity to spend time in public spaces without having to pay entrance fees or consume drinks or meals, etc. This will promote voluntary and mindful consumption on the part of the public. The *Linzer Stadtstrategie 2022* makes provision for the upgrading of public district centres to offer all-weather meeting points as “third place” to strengthen interactions among Linz inhabitants and to support the integration of different population groups. The Geschäftsbereich Planung, Technik und Umwelt is therefore requested to ensure the establishment of consumption-free zones initially in the city centre and subsequently across the entire urban area as part of a basic analysis of the Örtliche Entwicklungskonzept (ÖEK) and the Innenstadtkonzept.

GHG savings potential

Cannot be determined

Time of GHG reduction

Cannot be determined

Competence area

City of Linz

Responsibility area

Geschäftsbereich Planung, Technik und Umwelt, Direktion

Co-benefits

Improvement in quality of life; increase of attractiveness of the city area

Social impact

Cannot be determined

Citizen participation

It is recommended to unseal more areas in the city centre, to create seating including tables and to add adequate shading

Cooperations

Hospitality businesses in Linz; Linz University of Arts

Transformation potential

Transformative / very ambitious climate policy development path

Measure No. 49

Expansion of lending services modelled on the Dinglei(h) system

Major climate change mitigation levers

Promotion of climate-friendly lifestyles; reduction of incentives for climate-damaging consumption

Description of the measure

The public library of the City of Linz operates a system dubbed “Dinglei(h)”, which comprises a collection of useful items that can be borrowed free of charge with an active library card. Through this, the library intends to help its customers save money and space, as well as make a contribution to climate change mitigation. The Dinglei(h) is aimed at saving resources and producing less waste. An expansion of lending services modelled on the Dinglei(h) system by the public library represents a low-threshold service and an attractive way to reduce consumption- and end-user demand-based GHG emissions from private households. The expansion of the Dinglei(h) system will be subject to adequate resources, notably personnel and space, but also financial resources for purchases and service.

GHG savings potential

Medium savings potential: Total effect > 1 % to 3 %

Time of GHG reduction

GHG reduction already at the beginning of the measure

Competence area

City of Linz

Responsibility area

Geschäftsbereich Kultur und Bildung, Abteilung Stadtbibliothek

Social impact

Cannot be determined

Co-benefits

Improvement in quality of life; solution of other environmental problems

Citizen participation

It is recommended to expand rental services for cargo bikes

Cooperations

Volkshilfe Oberösterreich; Caritas Oberösterreich

Transformation potential

Transformative / very ambitious climate policy development path

Measure No. 50

Awareness raising and offers for climate-friendly consumption

Major climate change mitigation levers

Promotion of climate-friendly lifestyles; reduction of incentives for climate-damaging consumption; avoidance of air transport

Description of the measure

The possibilities and the specific characteristics of individual consumption patterns are closely linked to current supply structures. Supply structures include all social and technical processes that facilitate the consumption of goods and services, such as resource extraction, production, distribution, maintenance and repair. The goal to achieve climate neutrality by 2040 will require a political change in these supply structures, as well as a social realignment and value creation of central needs such as nutrition, leisure, and vacation. The City of Linz should push climate-friendly consumption options at events and lectures and through other forms of communication, addressing as many target groups as possible. Potential offers for climate-friendly consumption could include food sharing, repair workshops for everyday items, clothing swaps, etc. As part of awareness-raising campaigns, flight-related CO₂ emissions should be discussed, and climate-friendly alternatives should be made visible (e.g. at Climate Action Days Linz).

GHG savings potential

Cannot be determined

Time of GHG reduction

GHG reduction only at a later stage

Competence area

City of Linz

Responsibility area

Geschäftsbereich Büro Stadtregierung Linz, Abteilung Wirtschaft, Innovation, Klimaschutz und EU, jointly with the Geschäftsbereich Planung, Technik und Umwelt, Abteilung Stadtklimatologie und Umwelt, Volkshochschule Linz

Co-benefits

Improvement in quality of life; solution of other environmental problems

Social impact

Cannot be determined

Cooperations

other cities in Austria and in the European Union; Klimabündnis OÖ; Südwind OÖ; NGOs, educational institutions

Transformation potential

Incremental / little ambitious climate policy development path

Other activity areas

Measure No. 51

Defossilisation of the waste management through climate-friendly technologies

Major climate change mitigation levers

Defossilisation of the waste management and wastewater disposal

Description of the measure

All Linz citizens have access to a comprehensive waste collection and disposal system that comprises municipal refuse collection, waste collection points, free collection of bulky waste plus four waste collection centres (ASZ). Residual waste is used to generate thermal electricity for 40,000 households and heat for 11,000 households. The Bereich Abfall of LINZ AG is requested to purchase six electrically powered refuse collection vehicles by 2025 and to take steps to equip the entire fleet with alternative, climate-friendly drive types by 2040.

GHG savings potential

Low savings potential: Total effect < 1 %

Co-benefits

Solution of other environmental problems

Time of GHG reduction

GHG reduction already at the beginning of the measure

Social impact

Cannot be determined

Competence area

City of Linz

Cooperations

Umweltbundesamt GmbH; research institutes

Responsibility area

LINZ AG

Transformation potential

Reformative / relatively ambitious climate policy development path

Measure No. 52

Investigation and strengthening of natural greenhouse gas, respectively carbon sinks in the Linz urban area (forests, wetlands)

Major climate change mitigation levers

Increase of potential for carbon storage in the urban area

Description of the measure

The City of Linz boasts forest areas extending over 500 ha. Growing trees absorb carbon dioxide from the atmosphere, store its carbon in biomass and in the forest soil and release oxygen. During decomposition processes, such as decaying, rotting or burning of the trees, the carbon is released to form CO₂ with oxygen. The preservation and expansion of urban green areas especially natural ecosystems and near-natural spaces is vital to achieving the target of climate neutrality by 2040. In 2023, a collaboration as part of a bachelor's thesis between the University of Natural Resources and Life Sciences Vienna and the City of Linz was realised

to quantify the carbon sequestration potential of forests in Linz. Carbon management (reforestation, change in forest management) in Linz's urban forests represents one approach to carbon sequestration. Another natural carbon sequestration option is the re-wetting of areas (wet meadows and swampy ditches). Permanence is important in this regard, meaning that re-wetted soils must not be degraded or disturbed for several decades. Initiation of implementation projects has been scheduled.

GHG savings potential

Low savings potential: Total effect < 1 %

Co-benefits

Increase of biodiversity; synergies with other climate change adaptation measures; increase of quality of life

Time of GHG reduction

GHG reduction only at a later stage

Citizen participation

It is recommended that incentives be created for land owners and the nature reserve areas in Linz be expanded.

Competence area

City of Linz in consultation with the State of Upper Austria

Responsibility area

Geschäftsbereich Büro Stadtregierung Linz
Abteilung Wirtschaft, Innovation, Klimaschutz und EU (lead), jointly with the Geschäftsbereich Stadtgrün und Straßenbetreuung, Abteilung Botanischer Garten und Naturkundliche Station

Cooperations

Naturschutzbund Oberösterreich; University of Natural Resources and Life Sciences Vienna; State of Upper Austria

Transformation potential

Transformative / very ambitious climate policy development path

Social impact

Cannot be determined

List of references

BMK / klimaaktiv. (2020). Bauen und Sanieren/klimaaktiv Gebäude mit Zukunft. URL: https://www.klimaaktiv.at/dam/jcr:9d9b95b3-149b-4090-9b15-44ad025b904d/klimaaktiv_%20Bauen%20und%20Sanieren%202020.pdf, zuletzt abgerufen am 23.11.2023, 07:40

BMK / klimaaktiv. (2023) EU-Taxonomiekonformität im Gebäudesektor. URL: https://www.klimaaktiv.at/dam/jcr:02abbd12-f9e2-4b28-bc54-6fbfbe3417c4/Konformit_%C3%A4t_klimaaktiv_EU-Taxonomie_Geb_%C3%A4ude-WEB.pdf, zuletzt abgerufen am 23.11.2023, 08:25

BMK / klimaaktiv. (2023). Klimaaktiv Basiskriterien 2020. URL: https://www.klimaaktiv.at/dam/jcr:bac0c0f6-dd3d-4487-a9ef-270dd8448ea9/20230824_Brosch_%C3%BCre%20Basiskriterien%202020_bf.pdf, zuletzt abgerufen am 23.11.2023, 07:44

BMK / klimaaktiv. (s.a.). Moderner Holzbau / Nachhaltig bauen mit innovativen Holzbaustoffen. URL: https://www.klimaaktiv.at/dam/jcr:e8d39df3-0397-41e6-b1f6-dab821593867/Brosch_A4_Moderner%20Holzbau_FINAL_UA.pdf, zuletzt abgerufen am 22.11.2023, 17:12

BMK / nabe. (2021). Aktionsplan & Kernkriterien für die Beschaffung nachhaltiger Produkte und Leistungen. URL: https://www.nabe.gv.at/wp-content/uploads/2021/06/naBe-Aktionsplan_barrierefrei.pdf, zuletzt abgerufen am 19.10.2023, 13:31

BMK. (2023). Richtig sanieren mit klimaaktiv. URL: https://www.bmk.gv.at/themen/klima_umwelt/energiewende/energieeffizienz/richtig_sanieren.html, zuletzt abgerufen am 22.11.2023, 14:48

BMLFUW / klimaaktiv mobil. (2015). Umweltfreundliches Parkraummanagement / Leitfaden für Länder, Städte, Gemeinden, Betriebe und Bauträger. URL: https://www.klimaaktiv.at/dam/jcr:6a5bf1a3-14f3-443b-8153-9ec0a9129be9/Leitfaden%20Stellplatzmanagement%20_WEB.pdf, zuletzt abgerufen am 29.11.2023, 14:20

BMSGPK. (2021). Soziale Folgen des Klimawandels in Österreich.

CCCA. (2020). Themenaufbereitung: Co-benefits / Positive Nebeneffekte von Klimaschutz und Klimawandelanpassung. URL: https://www.klimafonds.gv.at/wp-content/uploads/sites/16/Themenaufbereitung_CoBenefits_2020.pdf, zuletzt abgerufen am 20.11.2023, 16:37

CCCA. (2022). CCCA Fact Sheet #37 / Einfluss von unterschiedlichen Ernährungsweisen auf das Klima. URL: https://ccca.ac.at/fileadmin/00_DokumenteHauptmenue/02_Klimawissen/FactSheets/37_ernaehrung_202204.pdf, zuletzt abgerufen am 10.08.2023, 08:20

CCCA. (2023). CCCA Fact Sheet #41 / Energie aus Holzbiomasse: begrenzte Klimaschutz-Potenziale. URL: https://ccca.ac.at/fileadmin/00_DokumenteHauptmenue/02_Klimawissen/FactSheets/42_kreislaufwirtschaft_202303.pdf, zuletzt abgerufen am 05.02.2024, 10:45

CCCA. (2023). CCCA Fact Sheet #42 / Kreislaufwirtschaft – Ein Beitrag zum Klimaschutz. URL: https://ccca.ac.at/fileadmin/00_DokumenteHauptmenue/02_Klimawissen/FactSheets/42_kreislaufwirtschaft_202303.pdf, zuletzt abgerufen am 21.11.2023, 11:55

Deutsche Energie-Agentur. (2021). Abschlussbericht, klimaneutrale Quartiere und Areale. URL: https://www.dena.de/fileadmin/dena/Publikationen/PDFs/2021/dena-Abschlussbericht_Klimaneutrale_Quartiere_und_Areale.pdf, zuletzt abgerufen am 09.08.2023

Energieinstitut Linz. (2017). FutureDHSsystem Linz / Sondierung neuer Konzepte für zukünftige Energietransformationen im Linzer Wärmesystem. URL: <https://energieinstitut-linz.at/wp-content/uploads/2020/01/FutureDHSsystem-Linz-Endbericht-Langfassung.pdf>, zuletzt abgerufen am 08.08.2023, 08:02

Global 2000. (2022). So heizen die Landeshauptstädte. URL: https://www.global2000.at/sites/global/files/GLOBAL2000Landeshauptst_%C3%A4dtestudie.pdf, zuletzt abgerufen am 07.08.2023

Joanneum Research. (2014). Potential der Tiefengeothermie für die Fernwärme- und Stromproduktion in Österreich. URL: <https://energieforschung.at/wp-content/uploads/sites/11/2020/12/834451-Endbericht-GeoEnergie2050-30062014-final.pdf>, zuletzt abgerufen am 05.12.2023, 15:15

Kompetenzzentrum Klimaschutz in energieintensiven Industrien. (2023). CCU-Technologie / Auf dem Weg zur klimaneutralen Industrie. URL: <https://www.klimaschutz-industrie.de/themen/technologien-und-querschnittsthemen/ccu-technologie/>, zuletzt abgerufen am 10.11.2023, 14:58

LINZ AG. (2022). Pressemitteilung: Ein Öko-Turbo für mehr Erneuerbare Energie / Startschuss mit einem Großprojekt: Wärmerückgewinnung durch einen energieeffizienten „Wärme-Wandler“. URL: https://www.linzag.at/media/dokumente/presse_2/linz_ag_gas_waerme_5/PK_Erneuerbaren_Offensive_Startschuss.pdf, zuletzt abgerufen am 13.10.2023, 14:10

LINZ AG. (2023). Pressemitteilung: E-mobil in die Zukunft. URL: https://www.linzag.at/media/dokumente/presse_2/linz_ag_strom_5/PK_E_Mobilitaet_Bilanz_Ausblick.pdf, zuletzt abgerufen am 28.11.2023, 16:05

LINZ AG. (2023). Pressemitteilung: PV-Boom: Aktivitäten der LINZ AG und ihrer Tochter LINZ NETZ GmbH. URL: <https://www.linz.at/medienservice/2023/files/>

PK20231005_PV_Boom_Aktivitaeten_LinzAG.pdf, zuletzt abgerufen am 13.10.2023, 14:05

LINZ AG. (2023). Pressemitteilung: tim Linz – Eine Erfolgsgeschichte. URL: https://www.linz.at/medienservice/2023/files/PK20230506_Tim.pdf, zuletzt abgerufen am 13.10.2023, 14:05

LINZ AG. (2023). Pressemitteilung: Weiterer Meilenstein für eine umweltfreundliche Wärmeversorgung in Linz. URL: https://www.linz.at/medienservice/2023/files/PK20230425_Meilenstein_umweltfreundliche_Waermeversorgung.pdf, zuletzt abgerufen am 11.12.2023, 13:12

Ministerium für Wirtschaft, Innovation, Digitalisierung und Energie des Landes Nordrhein-Westfalen. (2021). Kohlenstoff kann Klimaschutz / Carbon Management Strategie Nordrhein-Westfalen. URL: https://www.wirtschaft.nrw/sites/default/files/documents/mwide_carbon_management_strategie_barrierefrei.pdf zuletzt abgerufen am 10.11.2023, 15:26

New Energy for Industry. (2023). Heat Highway. URL: <https://www.nefi.at/de/projekt/heat-highway>, zuletzt abgerufen am 05.12.2023, 13:57

Österreichisches Institut für Bautechnik. (2023). OIB-Grundlagendokument zur Ausarbeitung einer OIB-Richtlinie 7 Nachhaltige Nutzung der natürlichen Ressourcen. OIB-330.7-009/23. URL: https://www.oib-rl.at/OIB-RL_7_Grundlagendokument_Ausgabe_Mai_2023, zuletzt abgerufen am 05.02.2024, 09:00

ÖGNI. (2023). Revitalisierung von Leerstand als Schlüssel für weiteres Wachstum. URL: <https://www.ogni.at/blog/revitalisierung-von-leerstand-als-schluesel-fuer-weiteres-wachstum/?cn-reloaded=1>, zuletzt abgerufen am 23.11.2023, 10:30

RAG Austria AG. (2024). Europäisches Referenzprojekt zur großvolumigen Wasserstoffspeicherung EUH2STARS startet unter österreichischer Führung. URL: <https://www.rag-austria.at/> - Pressemeldungen - Presse - Kontakt (rag-austria.at), zuletzt abgerufen am 08.02.2024, 14:11

Rieg, L., Meyer, A. & Bertignoll, H. (2019). Potentiale der Kreislaufwirtschaft zur Reduktion des Ausstoßes von Treibhausgasen. Berg Hüttenmann Monatshefte, 164/4, 169-172.

City of Linz. (2022). Pressemitteilung: Linz startet große Photovoltaik-Offensive. URL: https://www.linz.at/medienservice/2022/files/PK20221205_Photo-voltaikoffensive_fuer_Linz.pdf, zuletzt abgerufen am 13.10.2023, 14:15

City of Linz. (2022). Pressemitteilung: Umweltressort der City of Linz präsentiert neue Förderschwerpunkte. URL: https://www.linz.at/medienservice/2022/202211_117681.php, zuletzt abgerufen am 28.11.2023, 16:21

City of Linz. (2022). Pressemitteilung: Weiterentwicklung des Wirtschafts-Standorts Linz benötigt offensiven ÖV-Ausbau. URL: https://www.linz.at/medienservice/2022/files/PK20220330_PendlerInnen.pdf, zuletzt abgerufen am 27.11.2023, 08:20

City of Linz. (2023). Dingelei(h) / Leihen statt kaufen. URL: <https://wissensturm.linz.at/bibliothek/Dingeleih.php>, zuletzt abgerufen am 23.11.2023, 11:06

City of Linz. (2023). Pressemitteilung: Linz leistet Pionierarbeit für nachhaltige Beschaffung. URL: https://www.linz.at/medienservice/2023/202310_122464.php, zuletzt abgerufen am 19.10.2023, 13:42

City of Linz. (2023). Pressemitteilung: Linz startet große Photovoltaik-Offensive. URL: https://www.linz.at/medienservice/2022/202212_117930.php, zuletzt abgerufen am 04.12.2023, 09:30

City of Linz. (2023). Pressemitteilung: Nachhaltige Beschaffung: Linz schließt Partnerschaft mit dem Bundesministerium für Klimaschutz ab. URL: https://www.linz.at/medienservice/2023/202302_118648.php, zuletzt abgerufen am 19.10.2023, 13:33

Umweltbundesamt. (2023). Energieraumplanung. URL: <https://www.umweltbundesamt.at/energie-raumplanung>, zuletzt abgerufen am 04.12.2023, 14:30

VCÖ. (2023). Betriebliches Mobilitätsmanagement senkt Mobilitätskosten von Beschäftigten und Unternehmen. URL: <https://vcoe.at/themen/betriebliches-mobilitaetsmanagement-senkt-mobilitaetskosten-von-beschaeftigten-und-unternehmen>, zuletzt abgerufen am 24.11.2023, 12:40

WWF. (2011). Moore im Klimawandel / Studie des WWF Österreich, der Österreichischen Bundesforste und des Umweltbundesamtes. URL: https://www.wwf.at/wp-content/uploads/2021/03/Studie_2011_Moore_im_Klimawandel_WWF_OeBf_UBA.pdf, zuletzt abgerufen am 10.08.2023, 14:30

Imprint

Media owner, proprietor and publisher

Linz City Administration – Büro Stadtregierung Linz, Hauptplatz 1, 4041 Linz

Project lead

Oliver Schrot, PhD MSc (Climate Coordinator City of Linz, Büro Stadtregierung Linz)

Writing team

Oliver Schrot, PhD MSc; Michaela Feichtl, BSc; Katharina Gruber, BSc; DI Dominik Kreil; DI Hanna Mayrhofer, BSc (all Büro Stadtregierung Linz)

Project team

Franz Dörfler, MA; Armin Haba; Silvia Hackl; Christian Leitner; Isabella Huber (all Büro Stadtregierung Linz); Eva-Maria Seidel, BSc; Mag.^a Julia Engelen; DI Stefan Gritsch; Ing. Mag. Peter Ilchmann (all Gebäudemanagement und Tiefbau); Mag. Philip Lang; Mag.^a Silvia Gerhartinger; Mag. Michael Noldi (all Finanzen); Mag.^a Karin Schlager; Mag.^a Sabine Fürst; Mag.^a Theresa Greil; Sonja Kepplinger (all Magistratsdirektion); Christian Rois, MA, MA; Ing. tOAR Manfred Erlmoser; DI Dr. Martin Hochedlinger; Mag. Johannes Horak, PhD.; DI Gunther Kolouch; Ing. Edmund Maurer; Roman Minke, MSc; Dr. Hans-Martin Neumann; Mag.^a Dr.ⁱⁿ Nora Niemetz-Wahl; DI(FH)ⁱⁿ Judith Radhuber; MBA (all Planung, Technik und Umwelt); Mag. Karl Ludwig (Bau und Bezirksverwaltung); Mag. Martin Krammer; Thomas Schiefecker, MSc; Petra Schütz (all Stadtgrün und Straßenbetreuung); Elke Pflug; Nathalie Six (all former City Management Linz GmbH); DI (BA) Manfred Förderl; DI Gerfried Berger; DI Erich Ehrentraut; Ing. Mag. Bernd Freisais; DI Gerhard Jungwirth; DI Dominik Matheisl, BSc; Ing. Hubert Pauli, PMSc; DI Reinhold Plöchl; DI Andreas Reinhardt, MBA; DI Dr. Christian Scheinecker; Mag.^a Linda Maria Peer, MBA (all LINZ AG); Sarah Ortner; Ing.tAR Ralf Prieschl; Mag.arch Sandra Resch; Ing. Thomas Vitán; Mag. Markus Eidenberger (all Immobilien Linz GmbH); Ing. Peter Mair; Mag. Richard Held; Ing. Marko Ivos; Josef Moser; Dir. Mag. Nikolaus Stadler (all Gemeinnützige Wohnungsgesellschaft der Stadt Linz GmbH)

Steering committee

Mag.^a Ulrike Huemer (Director Linz City Administration / project principal); Mag.^a Karin Schlager; Mag.^a Bettina Gumpenberger, MSc (Director Büro Stadtregierung Linz); Dr.-Ing. Hans-Martin Neumann (Director Planung, Technik und Umwelt); Ing. Mag. Bernd Freisais (LINZ AG) i. V.; DI Erich Haider, MBA (General Director LINZ AG); Dr. Christian Schmid (Director Finanzen); Michaela Feichtl, BSc; Oliver Schrot, PhD MSc

Scientific review

Wegener Center for Climate and Global Change – University of Graz (Wegener Center für Klima und Globalen Wandel – Universität Graz), Climate Advisory Board City of Linz (Klimabeirat der Stadt Linz)

Editorial Design & Illustration

Zunder, Bischofstraße 5, 4020 Linz, www.zunder.studio

Copyright

Unless stated otherwise, Linz City Administration – Büro Stadtregierung Linz

14 March 2024. All rights reserved.



Print product with financial
climate contribution
ClimatePartner.com/53401-2404-1017

Produced in accordance to the
Guideline "Low pollutant print
products" of the Austrian ecolabel.
Gutenberg-Werbering GmbH, UW-Nr. 844

