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National Progress Report on the implementation of the New Urban Agenda

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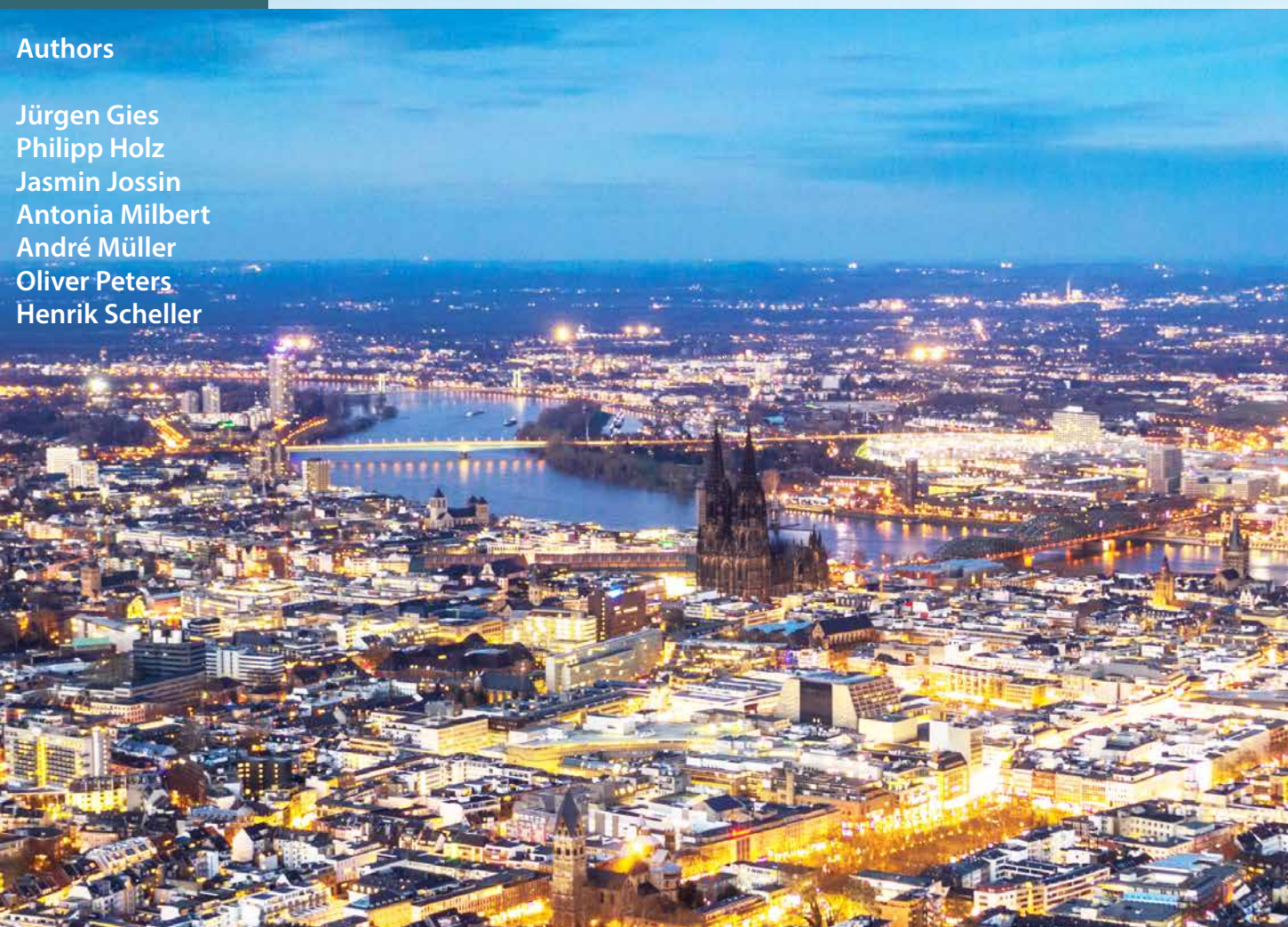

National Progress Report
on the implementation of the New Urban Agenda

A project within the research programme "General Departmental Research" conducted by the German Federal Ministry of the Interior, Building and Community (BMI) supervised by the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR) within the Federal Office for Building and Regional Planning (BBR).

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Dear Reader,

the General Assembly of the United Nations endorsed the New Urban Agenda in 2016 in the same way as the Member States of the United Nations agreed upon the 2030 Agenda in 2015. Both global agreements guide urban development now and in the future. The 17 Sustainable Development Goals (SDGs) as part of the 2030 Agenda aim at supporting the ecological, social and economic development of cities and communities, making them inclusive, safe, resilient and sustainable as well as enhancing the quality of life of their citizens.

This National Progress Report of Germany on Implementing the New Urban Agenda and the 2030 Agenda for sustainable development demonstrates on the basis of indicators and best practices that cities and communities are already responding quite successfully to the targets set in the New Urban Agenda and the 2030 Agenda. It is also obvious that challenges still exist – primarily with regard to climate protection, a future-oriented mobility in an urban-regional context and a comprehensive sustainability management on the local level.

I would like to thank the authors of the German Institute of Urban Affairs (Difu) who developed the report on behalf of the Federal Ministry of the Interior, Building and Community and together with the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR). I would also like to convey my thanks to the cities and communities – Baruth/Mark, Bremen, Cologne, Darmstadt, Eltville am Rhein, Juist, Mannheim, Niebüll and Stuttgart – for actively contributing to the report and thus carrying it through their engagement. The local workshop reports clearly show how sustainability targets are incorporated in integrated local development concepts.

Germany transfers this report to UN HABITAT – the Human Settlements Programme of the United Nations. It constitutes together with other national reports a basis for the Quadrennial Report that UN HABITAT develops every four years in order to report from a global perspective on the progress made in implementing the New Urban Agenda. The Quadrennial Report will be handed over to the General Assembly of the United Nations.

I wish you a stimulating reading.

Dr. Markus Eltges
Director of the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR)

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List of abbreviations

AI	Artificial Intelligence
AR5	Fifth Assessment Report
ARGEBAU	Working Group of the Ministries of Construction
BauGB	Building Code
BauNVO	Federal Land Utilisation Ordinance
BBSR	Federal Institute for Research on Building, Urban Affairs and Spatial Development in the Federal Office for Building and Regional Planning (BBR)
BfN	Federal Agency for Nature Conservation
BImSchG	Federal Immission Control Act
BITKOM	Federal Association for Information Technology, Telecommunications and New Media
BMI	Federal Ministry of the Interior, for Building and Home Affairs
BMU	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
BMVI	Federal Ministry of Transport and Digital Infrastructure
BMUB	Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety
BMZ	Federal Ministry for Economic Cooperation and Development
BVerwG	Federal Administrative Court
B2C	Business-to-Consumer
CEMR	Council of European Municipalities and Regions
CO_2	Carbon dioxide
DESTATIS	Federal Statistical Office
Difu	German Institute of Urban Affairs
DStGB	German Association of Towns and Municipalities
DWD	German Weather Service
ERDF	European Regional Development Fund
GG	German Basic Law
GHG	Greenhouse gas
GNK NRW	Globally sustainable municipalities in NRW
GRW	Joint Task for the Improvement of Regional Economic Structures
GVFG	Municipal Transport Financing Act
HBN	Hessian Alliance for Sustainability
ICT	Information and Communication Technology
IMA	Interministerial Task Force
IMAG	Interministerial Working Group
Infas	Institute for Applied Social Science
INKAR	Indicators and maps of spatial and urban development
IUDC (INSEK)	Integrated Urban Development Concepts
IUP	Integrated Environmental Programme 2030
IPCC	Intergovernmental Panel on Climate Change
IOER	Leibniz Institute for Ecological and Spatial Development
KBA	Federal Motor Transport Authority
LAG	State Agenda Working Group
LED	Light emitting diode
LH	State capital
MiD	Mobility in Germany
MIV	Personal motorised transport (PMT)

MLUL	Ministry for Rural Development, Environment and Agriculture
NIMBY	"Not In My BackYard"
NKI	National Climate Initiative
NO_2	Nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
ÖPNV	Local public transport
ÖV	Public transport
PBefG	Passenger Transport Act
PKW	Passenger car
PM_{10}	Particulate matter / fine dust
PMT	Personal Motorised Transport
RAD.SH	Municipal Working Group for the Promotion of Cycling in Schleswig-Holstein
RNE	German Council for Sustainable Development
ROG	Spatial Planning Act
SDGs	Sustainable Development Goals
SKEW	Service Agency Communities in One World
SPNV	Local passenger rail transport
SrV	System of representative traffic surveys
StMUG	Bavarian State Ministry for the Environment and Health
STS-AG NE	Secretary of State's Working Group on Sustainable Development
SUV	Sport Utility Vehicle
UBA	German Environment Agency
UN	United Nations
UNDESA	United Nations Department of Economic and Social Affairs
UN HABITAT	United Nations Human Settlements Programme
VDV	Association of German Transport Companies
VEP	Transport Development Plan
VV	Administrative agreement
WBGU	German Advisory Council on Global Change (WBGU)

Executive Summary

The progress in urbanization and ever more urgent sustainability issues are reflected in new approaches to sustainable urban development. The New Urban Agenda provides an international roadmap in this regard, pursuing the preservation of planetary boundaries in conjunction with social justice in the modern city. The aim of this report is to highlight Germany's national progress in implementing the New Urban Agenda and on the road to sustainable urban transformation.

Awareness of sustainability issues among politicians and the general public in Germany has grown significantly in recent years and is now expressed in various guiding principles and strategies that are continuously developed. Most recently, important steps, for example with the adoption of the New Leipzig Charter, have been taken to realign urban development policy in the sense of transformative urban redevelopment and thus in the sense of the New Urban Agenda. Municipalities are increasingly obliged to embed their planned urban development measures conceptually in corresponding sustainability strategies. Nevertheless, the starting conditions for urban development in general and a trans-formation of cities oriented toward sustainability goals, as envisaged by the New Urban Agenda and the Agenda 2030, remain very different. After all, the settlement structure, topography and demographics as well as the social, economic and fiscal framework conditions of the more than 11,000 municipalities in Germany reveal considerable heterogeneity. In addition, due to the federal structure of Germany, urban development policy is shaped partly by shared and partly by autonomous responsibilities of the individual federal levels. This increases the need for political and administrative coordination in a cross-cutting policy area such as urban development policy with its various interfaces to other policy areas. In many municipalities, various sustainability measures are already being implemented or at least discussed, without this always being done consciously under the umbrella of a local or the national sustainability strategy and corresponding monitoring in the sense of the New Urban Agenda and the 2030 Agenda. It is not uncommon for the topic of sustainability to be advanced in municipal administrations by individual forerunners. In view of the technical and practical challenges involved in implementing the New Urban Agenda and Agenda 2030, municipalities mention a lack of resources – as in many other areas – as an obstacle to the accelerated expansion of their sustainability activities.

Despite various coordination efforts, sustainability monitoring by the federal, state and local governments also shows very different levels of development – ranging from comprehensive and indicator-based sustainability reports to initial qualitative reviews, which are partly limited by missing or incompatible statistical data sets. The distribution of competencies at different levels and in different administrative bodies means that the development of strategies and monitoring systems vary in thematic emphasis and focus. Further efforts are needed to establish a cross-level and – where appropriate – standardized monitoring system for sustainable urban development and hence the New Urban Agenda’s implementation in Germany.

1. Introduction

1.1 Occasion, problem and goal

With this first progress report on the implementation of the New Urban Agenda, the Federal Republic of Germany (Germany) complies with a recommendation contained in the Agenda itself, adopted by the United Nations General Assembly in 2017, which states in accordance with Paragraph 166: " *We invite the General Assembly to request the Secretary-General, with voluntary inputs from countries and relevant regional and international organizations, to report on the progress of the implementation of the New Urban Agenda every four years, with the first report to be submitted during the seventy-second session of the Assembly*". The above-mentioned voluntary contributions by countries are to be understood as national reports in preparation for the first global report. They are to *provide* "[...] *a qualitative and quantitative analysis of the progress made in the implementation of the New Urban Agenda and internationally agreed goals and targets relevant to sustainable urbanization and human settlements*".

The aim of this report is to show what progress Germany has made in recent years towards the sustainable transformation of cities. The New Urban Agenda aims at preserving the natural basis of life, guaranteeing universal minimum standards for substantial, political and economic participation, reducing social inequalities, recognising the socio-cultural and spatial characteristics as well as the diversity of cities and urban societies, enabling individual competence and strengthening the potential for creativity and innovation. Similarly, in its report on the "Transformative Power of Cities", the German Advisory Council on Global Change (WGBU) outlined the special urban challenges and opportunities with regard to necessary transformation towards sustainability in this century. The New Leipzig Charter "The transformative power of cities for the common good", which was adopted in 2020 under Germany's EU Council Presidency, engages these approaches. The term "transformation" can only be found explicitly in one place in the New Urban Agenda (Paragraph 46 with reference to a "sustainable and inclusive economic transformation"). However, the sum of the Agenda's declarations of intent in the sense of the actual meaning of the word "transformation" (from Latin "transformare" = "to reshape") – aims at a fundamental and far-reaching re-working of the socio-technical, socio-ecological and socio-economic systems. This report makes frequent reference to transformation research in presenting the implementation status of the New Urban Agenda in Germany.

This progress report is also intended to address the challenges of reporting on a socio-ecological transformation agenda, including the fact that the New Urban Agenda contains a diversity of target formulations, but no indicators of its own by which the respective national monitoring and international benchmarking can be measured. It was necessary therefore, to resort to existing indicators of other target systems. Another challenge in preparing the present report was the comparatively short period of time allotted for evaluating sustainability progress. It has not always been possible therefore, to establish a reliable basis of clear development trends for various indicators, likewise eliminating particular year-specific effects that may have arisen as exceptions, has not always been possible. Nevertheless, analysis was made for the decade between 2010 and 2020, using the data and information available.

The report first presents the methodological approach (Chapter 1.2). What is new is the multi-level approach that closely involves municipalities in the reporting process. The selection process with regard to topics and methods, provides the framework for analysing and documenting progress achieved in implementing the New Urban Agenda in Germany. In order to place the individual sustainability activities of the German municipalities into a legal-institutional context, the report introduces the fundamentals of general urban development policy in Germany, as well as the various federal levels of sustainability policy. (Chapter 2). Readers familiar with the political structures in Germany can skip this chapter if necessary and turn directly to Chapter 3, which documents the empirically determined progress of municipal sustainability activities in selected thematic fields. The conclusions in Chapter 4 are explicitly devoted to the question of how the conditions for participatory, multi-level and evidence-based re-

porting are currently to be assessed, and what measures are required to further optimise such monitoring in the future.

This structured presentation and summary of sustainability activities in the Federal Republic of Germany, seeks to contribute to the further establishment and improvement of a multi-state and multi-level sustainability monitoring and benchmarking system, in the hope that socio-ecological transformation will occur as a contribution to a "sustainable development in an integrated and coordinated manner at the global, regional, national, subnational and local levels" (Paragraph 9 New Urban Agenda). Due to the methodological focus and selection of content, many other important measures of municipal sustainability (e.g. green spaces / green infrastructure, energy efficiency, etc.) cannot be addressed in equal detail here; they may be the subject of further in-depth analyses.

1.2 Methodical approach

This research report for the Federal Republic of Germany, is intended to contribute to the preparation of the first global progress report on the New Urban Agenda. As such, it presented an opportunity to focus indepth on questions of multi-level and indicator-based reporting – and to do so with the direct involvement of municipalities. In order to cope with this challenging task, while remaining within the limited scope of this report, some basic but necessary selection decisions were made. These included

- selection of sustainability topics and fields of action,
- selection of a reference framework in the form of an appropriate indicator system, and
- selection of partner municipalities to participate in the monitoring process.

Within this context, it is necessary to first present the methodological process, as the presentation of results refers to these preconditions that have been met.

Similar to the 2030 Agenda, the New Urban Agenda addresses various fields of action for (municipal) sustainability activities. Since these cannot be discussed here in their entirety, the topics of climate change and climate adaptation, as well as mobility in the urban-rural context, were selected to document the implementation progress. In what the follows, digitalisation is understood as a multi-sectional issue that directly or indirectly affects almost all topics of the New Urban Agenda. The areas are selection for their increasing importance across all three fields of sustainable development in the course of increasing urbanisation. The fact that the three fields of action, which are the focus of the analysis here, will be of particular importance in the future is also confirmed by the annual surveys of mayors of major cities, which was conducted by the German Institute of Urban Affairs (Difu). In 2019, for example, housing (66%), mobility (44%) and digitalisation (35%) were among the most relevant topics for local government policy (Difu 2019). In the 2020 survey, the topic of climate protection moved to the top (64%) ahead of mobility (56%) and digitalisation (36%) (Difu 2020). These survey results show that the political perceptions in German municipalities are clearly in line with international developments. The effects of global megatrends are already being felt at the municipal level, and are generating growing political pressure for action. They deserve appropriate recognition in the context of progress reporting on the New Urban Agenda.

A mix of methods was chosen to document, analyse and evaluate Germany's progress in implementing the New Urban Agenda and the urban dimension of the 2030 Agenda in the two selected thematic areas. This is the only way to overcome the challenges posed by the processing and consolidation of the often widely ranging data sets of the federal government, the federal states and the municipalities in terms of quality and quantity, timeliness and consistency. Due to the sovereignty of the federal states and the autonomy of the municipalities, responsibility for statistics is often at the respective federal levels – despite recent attempts to unify relevant indicator data and to process it in an aggregated form and at a centralised level.

The New Urban Agenda does not formulate its own indicators, rather it refers to the Sustainable Development Goals (SDGs) in its system of targets and indicators, which have been adapted into the indicator system of the German Sustainable Development Strategy (see below) also with relevance for municipalities. However, especially in view of the comprehensive taxonomy of SDG targets and indicators, the corresponding data collection – particularly at the municipal level – often remains in its infancy. Even though many municipalities in Germany have now begun to create indicator-based sustainability management systems, they typically focus on their own target achievement rather than on inter-municipal comparison and multi-level adaptability. Many locally developed indicator systems have so far failed to meet such a requirement. Data availability is often complicated, especially for the SDG indicators, for which official statistics are unavailable across the board.

The first step towards determining the type and extent of progress municipalities have made in their sustainability activities in the fields of climate protection and climate adaptation, as well as mobility in the urban-rural context, began with research, process and analysis of relevant data from official statistics, in particular from the statistical offices of the federal and state governments. The basis for this preliminary work was the indicator catalogue "SDG Indicators for Municipalities", developed and continuously refined since 2017. Representatives of the BBSR, the Association of German Cities, the DStGB, the German County Association, the German Institute of Urban Affairs (Difu), Engagement Global and the Council of European Municipalities and Regions (German Section) contributed to development and refinement of this indicator catalogue as part of a working group. The SDG indicators for municipalities specify and concretize the SDGs for municipalities in Germany and are therefore also based on the indicator system of the German Sustainable Development Strategy. Because to date no tried and tested indicator system had been developed for the New Urban Agenda in German cities, recourse was made to indicators for the implementation of the SDGs of the 2030 Agenda. Moreover, BBSR's data resources – and here in particular the INKAR data tool (Indicators and Maps of Spatial and Urban Development) – have already been made compatible with the requirements of an SDG reporting system for municipalities. Against this background, a combined reporting on both agenda processes and the exploitation of corresponding synergies would seem to be advantageous especially since both cases involve an indicator-based analysis of thematic fields that can all be encompassed under the umbrella of sustainable urban development. Preparation of official statistics data of the individual thematic fields was carried out in the form of longitudinal analyses, with aggregated evaluations for Germany as a whole and individualized evaluations for federal states and regions.

In addition to an evaluation of existing data, the present report includes a collection as well as a comparative analysis of original primary data from selected municipalities after processing. For this purpose, consultations were held with several municipalities of different population sizes, and regions that have already set up a sustainability management system.

“Municipal sustainability management" is understood as "a set of processes, measures and instruments” that a “local government regularly applies in junction with local policy in order to steer the community development towards sustainability. In accordance with the principle of recognising planetary boundaries, the central challenge of sustainable local development in European cities and municipalities is to ensure the participation, livelihood and security of supply for all areas of the local population, while steadily reducing per capita consumption of natural resources".

Source: ICLEI / Bertelsmann Foundation 2018

In a first step, around 25 potential partner municipalities were pre-selected. To this end, a systematic sampling of the 127 signatory municipalities of the 2030 Agenda – as of September 2019 – was initiated according to the BBSR's city and municipality typology and the KOSIS community of municipal statistics. In this way, allocations could be made based not only according to geographical location, but primarily on the basis of class size, demo-

graphic dynamics (growing or shrinking) and settlement structure characteristics (sparsely populated rural county to large city) as well as various city and spatial types (from highly central to peripheral). In addition, the sampling typology recorded the extent to which the municipalities already participate in other sustainability projects. These include for example project "Globally Sustainable Municipality" of the Service Agency Communities in One World (SKEW) of Engagement Global on behalf of the Federal Ministry for Economic Cooperation and Development (BMZ); the project "Agenda 2030 – Sustainable Development at the Local Level" on behalf of the Bertelsmann Foundation. Sampling also considered to what extent the municipalities have already received or have been nominated for the German Sustainability Award for Cities and Municipalities; to what extent they document the progress of their sustainability management; or to what extent they have already prepared one or more sustainability reports – possibly with a view to The 2030 Agenda and the SDGs. A shortlist of partner municipalities of different sizes and geographical locations was made from the list of all cities and regions categorised in this way.

Either a one-day or one-and-a-half-day (virtual) workshop or several telephone interviews were conducted with each of the municipalities to discuss indicator-based sustainability management for the implementation of the goals of the New Urban Agenda. Municipalities were advised how to further expand the respective SDGs in their own municipality through appropriate data collection, data preparation and data processing. For this purpose, a workshop concept and a semi-standardised interview guide were developed, with special attention paid to the local experience and framework conditions of the individual partner municipalities (cf. Appendix). In addition, the municipalities received a catalogue of possible sustainability indicators for each of the thematic fields – climate change and climate adaptation and mobility in the urban-rural context, as well as digitalisation as a multi-sectional issue – in advance (cf. Annex). These catalogues contained the relevant SDGs, including both the existing and likely future SDG core indicators, as well as other potential indicators that could be supplements to the SDG core indicators. These were discussed in the “SDG Indicators for Municipalities” working group in parallel to the preparation of this report. The pre-selection of indicators formed the basis of workshop discussions and interviews with the partner municipalities, at which time the city-specific relevance of pre-selected indicators was explored, as was data availability and possible conflicts of objectives. The following aspects, among others were discussed in detail:

- What progress has (not) been made in implementing individual sustainability goals in the thematic areas in recent years? Which indicators were (not) used and for what reasons?
- What are the advantages and disadvantages of individual thematic indicators for specific city contexts?
- What approaches are being pursued with a view to more efficient and more targeted data collection, processing and provision in the municipalities?
- To what extent are local/municipal data compatible with regional and national data?
- How are city-specific peculiarities dealt with in the collection and processing of data on individual indicators?
- Which locally known successes or failures are not reflected in the data mapped with different indicators or can be reported beyond the data?

The indicator-specific findings from the partner municipalities were synthesised for the present report and combined with data from the national and regional levels (federal states) into graphical representations. Furthermore, all municipalities received a questionnaire on all three topics. Their responses informed an index to identify each municipality’s development status of sustainability management across each respective field of action, and a comparison of all partner municipalities was made.

The practical field phase served to gather findings on the progress of local and regional implementation of the goals of the New Urban Agenda and the SDGs, and to identify possible adaptation and optimisation needs for indicator-based sustainability management. This included statistical recording and documentation of municipalities in the federal multi-level system, triggering an impulse to deal more deeply with data-based monitoring of urban sustainability at the municipal level.

2. Political Framework for the implementation of the New Urban Agenda in the Federal Republic of Germany

In addition to the selection decisions and methods that guided the analysis of this report, the results documented here are significantly the result of the legal framework, state structures and processes that shape the implementation of a sustainable urban development policy. As such, Chapter 2.1 first deals with constitutional aspects of Germany's federal state structure, which shapes sustainability policy in Germany in a particular way. Special attention will be paid to the themes of climate change and mobility, thereby addressing two global issues whose developments are not necessarily new, but constitute a particular concern due to their dynamic intensification and visibly noticeable consequences today. For despite a current globally recognisable change in awareness together with increasing efforts, neither trend has yet been halted or even reversed. The ultimate consequences of these negative trends are that the world's social and natural biophysical systems will no longer adequately support human well-being and will lead to increasing political tensions. The need for accelerated and transformative change is thus obvious (UN 2019). It is no coincidence that precisely these challenges formed the starting point for the development of the 2030 Agenda and the New Urban Agenda: the preservation of planetary boundaries through comprehensive environmental and nature conservation as a contribution to the global realisation of social justice.

Fig. 1: The New Urban Agenda Action Framework

Source: own illustration

Chapter 2.2 outlines how the New Urban Agenda and the 2030 Agenda are implemented at the different federal levels in Germany. To this end, the different strategies of the federal government, the federal states and the municipalities are examined. Chapter 2.3 is then dedicated to the foundations of urban development policy in Germany. Sustainability policy in general and urban development policy in particular form the framework for action towards the New Urban Agenda in Germany (cf. Figure 1).

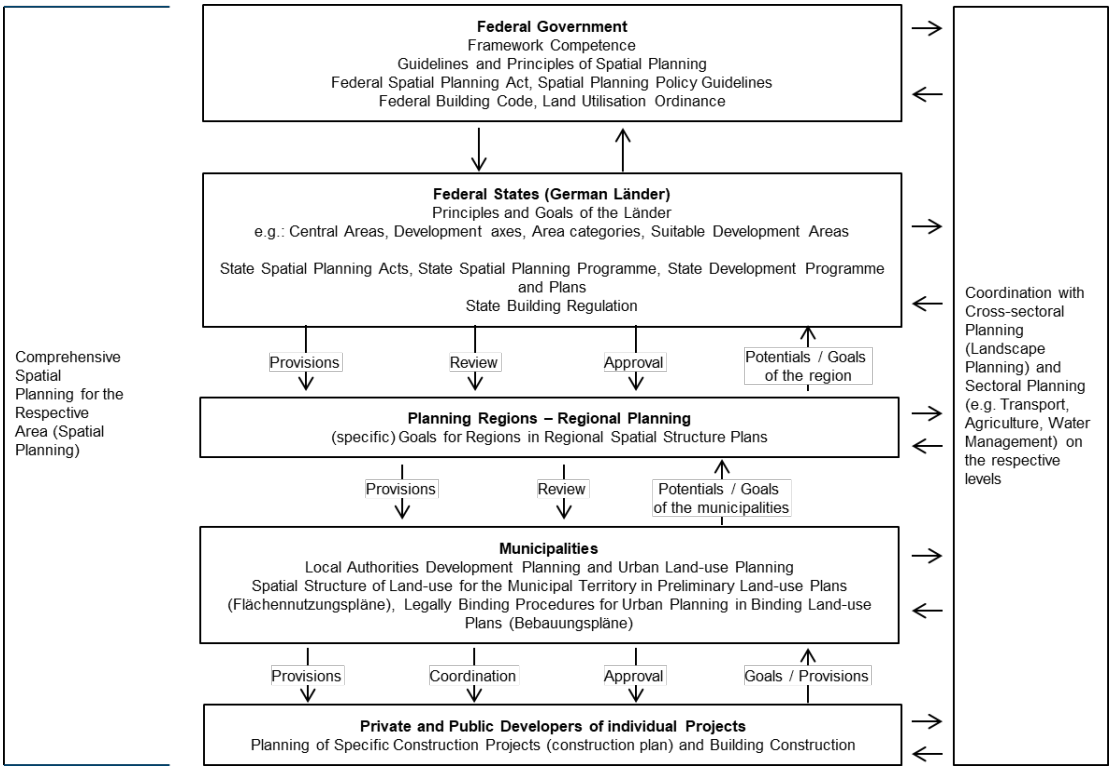
2.1 Sustainability policy and management of global trends in the multi-level system

The Basic Law, which forms the Federal Republic of Germany's constitutional framework, contains a provision on state objectives (Article 20a of the Basic Law). It stipulates that "mindful also of its responsibility towards future generations, the state shall protect the natural foundations of life and animals by legislation and, in accordance with law and justice, by executive and judicial action, all within the framework of the constitutional order". The reference to the "constitutional order" in this constitutional article already indicates that sustainability policy in the Federal Republic is organised on a National level. For according to Article 20 (1) of the Basic Law, Germany is "a

democratic and social federal state". The municipalities, as a constitutional part of the federal states (the Länder), form their own administrative level and have autonomy of self-administration according to Article 28 (2) GG.

The political and administrative handling of the global trends of our time, such as increasing inequalities, climate change, loss of biodiversity and increasing amounts of waste, has its own underlying rationality and logic in such a multi-level system. This is because responsibility for the development, implementation and financing of political measures that can counter the effects of these noticeably exacerbated global trends, in the sense of the sustainability principle, lies in a shared responsibility with the federal state structure, together with a high degree of local authority ownership. This requires interdisciplinary and multi-level coordination. Negotiation and cooperation processes of this kind are not only time-consuming, but they often lead to a necessary balancing of interests and goods between the different levels and actors, with compromises perceived critically by the media as "agreements based on the lowest common denominator". Nevertheless, a planning counter-current principle (see Figure 2) comes into play in these negotiations. In fact, this forces the federal, state and local governments to reassure each other when making decisions on sustainability issues, which often have to be made in a very unpredictable environment. Uncertainties arise, for example, from the unforeseeable occurrence of scientifically modelled scenarios on megatrends, including possible consequences for humans and nature as well as the state's ability to act.

Fig. 2: Planning types and hierarchy of spatial and urban planning in Germany

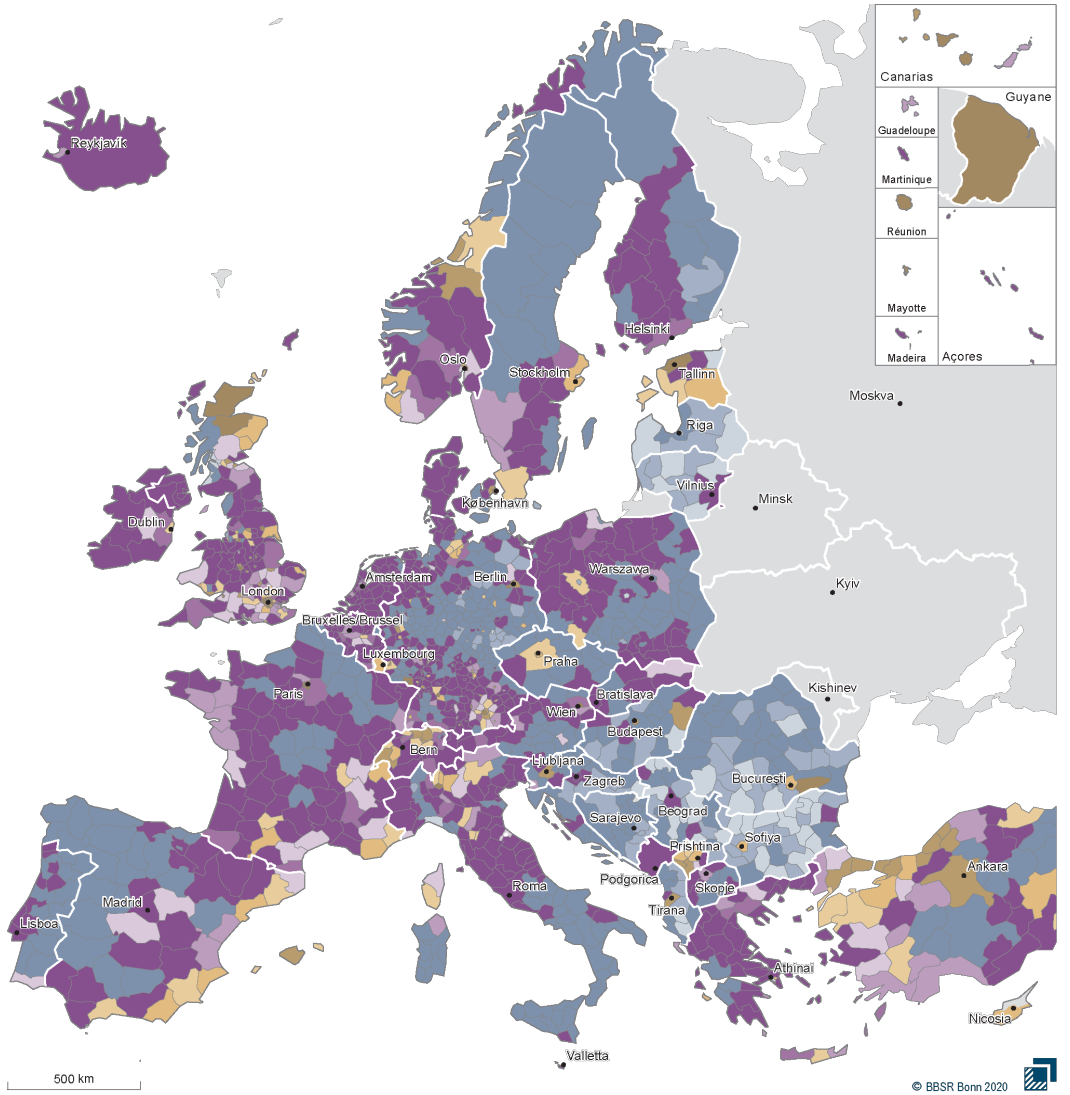


Source: BT-Drucksache 13/3679 of 06.02.1996, p. 13 based on Praxis Geographie 9/1993

In federal multi-level systems, cities of different sizes and geographical locations play a central role in dealing with global megatrends. By 2050, urban areas could be home to around 70% of the world's population and generate 85% of global economic output (UNDESA 2019). With this concentration of people and economic activity, policy decisions and investments in cities have correspondingly profound and long-lasting impacts.

Since 2015, the United Nations' 2030 Agenda has been the global reference framework for a "great transformation", (also) at the municipal level. It defines 17 global goals and 169 sub-goals (Sustainable Development Goals (SDGs)). The 2030 Agenda combines the Rio Process and the further development of the Millennium Development Goals. It identifies five basic principles (People, Prosperity, Planet, Partnership, Peace) with a focus on nature conservation and social justice. It takes the developed countries, including their municipalities, to task for solving global challenges and thus reducing the vulnerability of less developed states and emerging economies. SDG 11 "Make cities and human settlements inclusive, safe, resilient and sustainable" explicitly addresses municipalities; sustainable land development is called for here in particular in sub-goal 11.3.1, whose urban and spatial dimension is expressed in the ratio of the development of settlement and transport areas as well as population (see Figure 3). Furthermore, large parts of the 2030 Agenda are determined by an – albeit implicit – understanding that municipalities and local actors represent the actual level of action for achieving many of the subgoals (Assmann et al. 2018: 21). As coordinated urban planning is practised in more than 75% of the 193 signatory states, multi-level coordination is essential to align national policies and local actions (United Nations 2017: 41). The German Sustainable Development Strategy, as the implementation of the 2030 Agenda in Germany, explicitly takes up this vertical integration. It is the result of many political initiatives that converge in the Committee of State Secretaries for Sustainable Development. Already with the first meeting in 2012 on the topic of "Sustainable Policy for the City of the Future", the resolution adopted in 2015 to establish the "Interministerial Working Group on Sustainable Urban Development in a National and International Perspective" and further joint resolutions with the federal states and municipalities, cross-level coordination on sustainable urban development has been continuously pursued (for further information, see chapter 2.2.1) and will again discuss and reaffirm the role of municipalities for sustainable development in June 2021. At the local level, more than 160 German municipalities (as of December 2020) have so far explicitly committed to the 2030 Agenda in a specimen resolution of the German Association of Cities and Towns and the Council of European Municipalities and Regions, thus affirming their role in implementing the 2030 Agenda.

Fig. 3: Development of built-up area in relation to population development in Europe



Ratio of the annual percentage change of built-up area and population change between 1990 and 2014

Source: Spatial Monitoring System for Europe
Origin of data: Global Human Settlement Layer
Administrative data: GfK GeoMarketing, NUTS 3 regions (2013)
Author: V. Schmidt-Seiwert

with an increase of built-up area by declining population	with an increase of population higher than the increase of built-up area	with an increase of built-up area higher than the increase of population
up to below –1.0	0.0 up to below 0.25	1.0 up to below 1.25
–1.0 up to below –0.5	0.25 up to below 0.5	1.25 up to below 1.5
–0.5 up to below 0.0	0.5 up to below 0.75	1.5 up to below 1.75
	0.75 up to below 1.0	1.75 and more

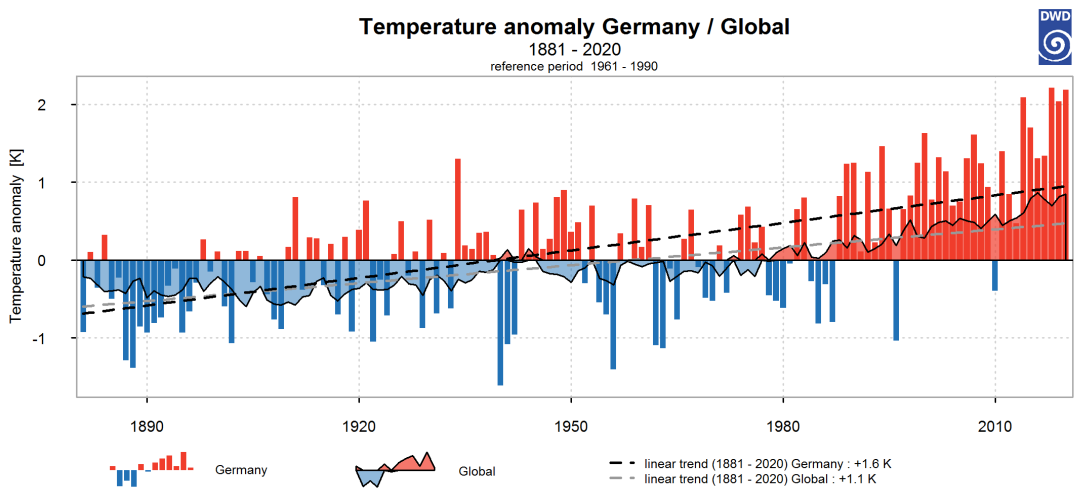
Source: BBSR 2019

In what follows, the challenges that climate change and mobility pose for (municipal) sustainability management will be discussed by way of example. The presentation is based – where possible – on the SDG indicators. Since the new technological possibilities of digitalisation are also increasingly being used in these two areas to achieve the sustainability goals of the New Urban Agenda and the 2030 Agenda, the subject-specific implementation of digital technologies, approaches and processes is also repeatedly addressed as a possible coping strategy – insofar as this is possible and data is available.

2.1.1 Climate change: climate protection and climate adaptation

The fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC) of 2014 warns urgently that the increase in the globally averaged combined land and ocean surface temperature in the period 1880 to 2012 was 0.85 °C – this corresponds to a warming of 0.64° C in the past 100 years (IPCC 2014). The data series of the last 50 years even indicate an acceleration of this development. The global temperature increase in the 1970 to 2019 period amounts to 0.18 °C per decade. If the generally milder temperature increase over ocean areas is not taken into account, the result is even a linear trend of 0.37 °C per decade. This more than doubled temperature increase is consistent with the observed temperature increase in Germany, which for the most part, is dominated by land areas (see Figure 4), causing faster increases in warming than the global mean. (DWD 2020).

Fig. 4: Comparison of temperature anomalies worldwide and in Germany since 1881



Source: DWD / NOAA 2020

The mean air temperature in Germany increased by 1.5 degrees from 1881 to 2018. The increase in mean temperature is also associated with a higher number of "hot days" – these are days when temperatures rise above 30°C. Since 1951, this has increased from about three to currently about 20 days per year, with burdens for people especially in cities (Umweltbundesamt 2019a).

Extreme weather events, rising sea levels and accelerated loss of biodiversity represent some of the far-reaching consequences in the overall spectrum of climate change development. These ecological changes have a disproportionate impact on the poorest and most vulnerable groups in society (Shi et al. 2016) and thus also have social dimensions.

For decades, evidence for the existence of anthropogenic climate change has been mounting, to the point that "it is extremely likely (the probability of occurrence for this statement is 95-100%) that human influence has been the main cause of the observed warming since the mid-20th century" (IPCC 2013). Nevertheless, it is only in the last few years that the problem of global warming has gained further attention it needs to strengthen a coordinated response from the international community. Accordingly, the urgency attributed to climate protection by (senior) mayors Germany has also risen sharply in the last two years (Kühl & Grabow 2020). As a globally coordinated effort, the Paris Climate Agreement envisages limiting man-made global warming to well below 2° C above pre-industrial levels in order to prevent an irreversible hot period with serious global consequences for humanity. The significant reduction of greenhouse gas emissions (GHG emissions) is of utmost importance in this context. In its Climate Protection Plan 2050 of 2016, the Federal Republic of Germany committed to reducing its GHG emissions by at least 40% by 2020, compared to 1990. Accordingly, Germany is to be climate neutral by 2050. For the year 2030, the national climate targets to be achieved by the Climate Protection Program 2030 envisage a reduction in greenhouse gases of 55 % compared with 1990. At the beginning of 2020, it was still assumed that the target for this year would be missed, nevertheless, the Corona pandemic and a mild winter have meant that Germany was able to achieve its climate protection target for 2020 after all (Hein et al. 2020). The framework for adaptation to climate change is set by the German Strategy for Adaptation to Climate Change (DAS 2008), including the Second Progress Report (2020). Adaptation to climate change is specified as a cross-level task. The Third Action Plan identifies support formats for municipalities. These include the German Climate Preparedness Portal – KLiVO, support programs such as urban development funding and the DAS program "Measures for Adaptation to Climate Change," and research programs such as the flagship initiative Local Climate and Environmental Models for Future Cities and Regions.

According to Paragraph 63 of the New Urban Agenda, cities "[...] central role in the global economy, in the mitigation and adaptation efforts related to climate change, and in the use of resources and ecosystems [... have] a direct impact on sustainability and resilience well beyond urban boundaries". In order to achieve the German climate protection goals, municipalities and cities, as places where people live and conduct business, have a special responsibility for climate protection. The same applies to the resilience of the regions with regard to the consequences of a warming climate for Germany. In addition to the relevance of the New Urban Agenda in combination with SDG 11 of the 2030 Agenda, SDG 13 "Take urgent action to combat climate change and its impacts" should be mentioned in relation to climate protection and climate adaptation. Furthermore, SDG 7 "Affordable and clean energy" and SDG 12 "Ensure sustainable consumption and production patterns" offer somewhat indirect incentives for action that emphasise the global impact mechanism of direct climate protection.

The scope of action for cities, which is made visible by the SDG sub-goals relevant for municipalities, is manifold. Possible measures of municipalities range from information provided on the topic of climate protection, to the energetic refurbishment of municipal buildings, and alternative public transport options as a means to the end of concrete CO_2 reduction, as well as climate adaptation as a cross-sectional task that needs to be coordinated within the municipal administration. As an efficient and influenceable parameter, decarbonisation for the protection of the climate, the environment and all associated system services now represents – at least in principle – a reference value that is recognised across policy fields, both globally and locally. At the same time, awareness of the need for comprehensive measures to mitigate the consequences of a warming climate has also increased. At the national level, this is based not least on the prominent anchoring in the German Sustainable Development Strategy, which serves as a cross-departmental framework for action for all measures to implement sustainable development by 2030 (Federal Government 2018, 2016). Thus, reference is made to these goals not only in the classic fields of environmental and resource/land policy, but also, for example, in the context of regional economic policy and transport policy. One of the objectives of the European Regional Development Fund (ERDF), whose resources are often used to co-finance measures within the framework of the Joint Task for the Improvement of Regional Economic Structures (GRW), is a $_{\text{low-carbon}}$ economy. Within the framework of European cohesion policy,

low CO_2 economic sectors are now allocated a mandatory minimum share of the available funds. CO_2 reduction is also addressed in transport policy and in discussions on urban development towards a smart city.

Despite common values, conflicts of interest exist at the local as well as the global level. With regard to the degree of separation, municipal and national interests are often multi-dimensionally located between environmental and economic policy, the smaller elements of which are determined by urban, transport or social policy. The seriousness of these conflicts of interest illustrates that there are various cases that can best be solved by fundamental political decisions, rather than by greater administrative coordination. Examples of efforts on the part of administrations to develop integrative solutions can be found where varying conflicts of objectives across policy fields exist. An example of this is the Alliance for Affordable Housing and Construction, which was launched in summer 2014. Organised as a multi-stakeholder dialogue, the alliance defined the working topic "social and climate-friendly housing and construction" as one of four central fields of action. Specifically, the topics included "climate-friendly housing for low-income households", "neighbourhood solutions" and the KfW programme "energy-efficient urban refurbishment", the "further development of the CO_2 building refurbishment programme", a strengthening of "energy advice" and "legal framework conditions for investments in favour of climate protection and energy saving". While these topics primarily served the intersections between housing policy and environmental policy, the other three overarching fields of action of the alliance, more strongly intersected with urban development policy.

Urban development strategies summarised under the term smart city, and characterised by the use of new types of ICT solutions, are a new approach to pushing climate protection and climate adaptation measures at the municipal level. Even though corresponding approaches are still in their infancy in Germany, many cities hope to improve their future viability through so-called "smart solutions", to become more digital and to network individual areas such as energy, buildings or mobility more closely and sustainably with one another. Digital communication systems, information technology collection and processing of exponentially growing amounts of data all bring about diverse, and disruptive changes (digital transformation). They and are currently also fundamentally changing cities and their public services (Libbe 2018 and 2019). Paragraph 66 of the New Urban Agenda also commits "[…] to adopting a smart-city approach that makes use of opportunities from digitalization [...]".

Against this background, the federal government's implementation strategy "Shaping Digitisation" focuses primarily on temporary model projects that serve to develop and test new technologies or the digitisation of administrative processes. In contrast, digitisation issues have so far played a relatively subordinate role in the policy fields, with regional and municipal relevance that are geared towards spatial and land use design. The topics of "Smart City" and "Smart Country" are however, now also addressed by the "Smart City Charter – Sustainably Shaping Digital Transformation in Municipalities" (BBSR, BMUB 2017) and their corresponding funding programmes. The Future Radar Digital Municipality of the German Association of Towns and Municipalities (DStGB) has repeatedly shown that municipalities recognise the importance of digital transformation (Hornbostel et al. 2018, 2019), but integrative approaches that also take into account urban planning and environmental policy remain rudimentary at best. Nevertheless, digitalisation is a field of action that is not only particularly suitable for cross-policy coordination, but also virtually forces it. The fact that in some cases entirely new content and technologies have to be developed from all policy areas and flanked by social and data protection impact assessments, should be reason enough in the future to combine administrative capacities and push for interdepartmental approaches. However, the existence of nationwide broadband and mobile networks with fast transmission speeds is considered the backbone for digital applications and can be noted as a model for the linking of the 2030 Agenda and the New Urban Agenda.

Digitisation as a global process and as a strategy for coping with the consequences of climate change offers opportunities for more efficient administrative action and more environmentally and climate-friendly services of general interest. However, it also poses risks with regard to increasing disparities in spatial development, and increasing energy and resource consumption. Although cities' digitisation strategies are increasingly being placed

in the context of overarching urban development goals, the question of the sustainability of digitisation itself has not yet been answered satisfactorily (WBGU 2019). Systematic monitoring and comprehensive evaluation of digitisation strategies, including corresponding projects – especially with a view to their sustainability – has not yet been undertaken in the Federal Republic as a whole or at the municipal level. The goals of the 2030 Agenda also remain vague with regard to digitisation in the local context. There is no dedicated reference to the SDGs, but rather only an indirect mention in the sub-goals of SDG 4 "Quality education", SDG 9 "Industry, innovation and infrastructure" and SDG 16 "Peace, justice and strong institutions".

2.1.2 Mobility in the urban-rural context

The terms mobility and transport are often used synonymously, but there are differences in the terms, as transport is a cause of problems in the realisation of mobility. Mobility is a constituent feature of modern societies. This is because opportunities to change the social and professional position of the individual by taking advantage of educational and professional opportunities also presuppose a corresponding willingness to be mobile and the availability of mobility options. From today's perspective, it is important to maintain this mobility, but to reduce the negative effects of the associated traffic on the environment and on people (for example, burdens on residential environments, exclusions due to a transportation system that is biased towards motorised individual transport, separation effects and extended routes for pedestrians and cyclists) in the sense of a sustainable social transformation. If, for example, settlement development oriented towards the guiding principle of short distances makes it possible to reach destinations within walking distance, traffic costs can be reduced. Mobility in society does not increase simply because distances become greater. Rather, it is about the accessibility of destinations. The ecological and social burdens caused by traffic can be reduced by shifting to a different means of transport of the so-called environmental network consisting of public transport, bicycles and other means of shared transit, but also by making technological improvements to vehicles. Nevertheless, it is important to avoid rebound effects. Gains in efficiency must not be compensated for by additional traffic or ever larger vehicles, yet, this is precisely where the central challenges of current transport development lie.

The transport sector in Germany has a share of just under 20% of total national CO_2 emissions. Road transport is responsible for over 90% of these emissions. While other sectors have been able to significantly reduce their emissions in recent years compared to the base year 1990, transport emissions have stagnated. The reason for this is increasing transport performance, i.e. the distances travelled are becoming longer. In addition, the number of passenger cars in German households is continuously increasing: 46 million vehicles were counted in 2017, meaning that there are more passenger cars than households. However, 42% of households in metropolitan areas do not own a car (BMVI 2018: 35 f.). Although new mobility modals such as car and bike sharing are booming, at least in the larger cities, they only have a niche existence in terms of total transport performance.

The use of today's road infrastructure is inefficient. The average car occupancy is 1.5 people, and in rush-hour traffic it is as low as 1.2 people. Low car occupancy is linked to one of the central challenges of cities: the enormous space required for moving and stationary traffic, which is visible in traffic jams and congested cycle paths and pavements on a daily basis. Critical in this context is the growing share of sport utility vehicles (SUVs) and newly registered off-road vehicles, whose numbers at the beginning of 2020 grew by 27.9% compared to the previous year and thus forms more than 13% of the total supply of passenger cars (KBA 2020).

Following the diesel emissions scandal at several major German car manufacturers, a February 2018 ruling by the Federal Administrative Court (BVerwG) established driving bans as a measure to comply with nitrogen oxide limits. However, this has also brought the problem-solving potential of local public transport (back) into the focus of political attention. With a view to climate protection, public transport services are to be expanded, frequencies increased, and attractive fares introduced. In January 2020, the federal and state administrations decided not only to significantly increase and stabilise investment funds, but also to increase the so-called regionalisation

funds, which are primarily used to finance local rail passenger transit (SPNV), i.e. regional trains and suburban trains. This decision finally met state and local industrial and political demands long under discussion.

The state of public transport in Germany under the current Corona pandemic conditions is quite ambivalent, with passenger numbers recorded as declining for the first time in decades. Prior to the pandemic, passenger growth and a long-standing reluctance to invest due to the unclear financial situation, together with a population that is increasingly critical of new construction projects (keyword: NIMBY – "Not In My Backyard"), resulted in a public transport service that has reached or already exceeded its peak hour capacity limits in cities and on urban-rural connections. In the case of the railways, measures within certain nodes of the network intended to create additional regional passenger and freight options were neglected in favour of high-speed lines for long-distance passenger transport. Only now, with the "Deutschlandtakt" concept, is there a master plan that equally considers the needs of freight and passenger local and long-distance transport. Important fundamental decisions for a more efficient railway system have been made in the planning, which should be adhered to even if political pressures change. Nevertheless, it will probably be years before sensible partial concepts are realised. For the railways and for local public transport, years of restraint and one-sided prioritisation are unlikely to be recouped, as the corresponding specialised administrations have both a lack of capacity in the construction industry, and a dearth of skilled workers for planning and construction. In addition, citizens must be involved in the planning process. All this takes time.

The route to sustainable transport and to ensuring compatible environmental and urban mobility has only recently been created, in particular through an increase in the Municipal Transport Financing Act (GVFG) and a successor regulation for the so-called unbundling funds. But it is precisely in transport policy that the discrepancy between aspiration and everyday practice is traditionally highly conspicuous. There is a broad consensus in transport science that people's transport behaviour can only be changed through a combination of push and pull measures – in addition to attractive public transport and cycling incentives (pull measures) (Holz-Rau/Scheiner 2018). Push measures are measures that make car use less attractive. In the scientific discussion, pricing measures are primarily cited as detractors to vehicular use, particularly with regard to private motorised transport (PMT) and its pollutant emissions. However, it is also much easier to control mobility behaviour through the availability of parking spaces for private cars. This includes, for example, a spatial separation of parking spaces and housing that corresponds at least to the walking distance to the next public transport stop, a reduction in the number of parking spaces available and consistent parking space management in city centres.

The majority of German cities already suffer from considerable traffic congestion. This applies not only to motorised private transport and the density of use of road infrastructure, but also to the considerable infrastructure bottlenecks in public transport, that lead to reduced quality of services. Furthermore, the settlement structure of many urban regions is often insufficiently public transport friendly due to the fact that new development areas have been designated without consideration of accessibility by rail-bound public transport, and the same applies to commercial, retail and leisure facilities. Despite these and other institutional, financial and individual obstacles, the reorientation of the "modal split" in terms of sustainable urban and regional development is inevitable as the key to a future-oriented mobility realisation.

In addition, the topic of digitalisation is becoming increasingly important in the field of mobility: integrated information and ticketing systems for example, are expected to reduce access barriers. Another aspect of digitalisation is so-called on-demand transport and, in the future, automated driving systems. However, digitisation still harbours uncertainties with regard to future technological development possibilities and social risks, to the point that policy decisions remain in a holding pattern entrenched in the individual policy fields. Integrative approaches – also in the area of mobility – can only be found in isolated cases.

2.2 Implementation of the New Urban Agenda and the 2030 Agenda in the German context

Both the New Urban Agenda and the SDGs of the 2030 Agenda explicitly highlight the role of cities in the successful implementation of a sustainable transformation. The New Urban Agenda and the 2030 Agenda set a historic precedent. This is the first time that the United Nations, as a membership organisation of national governments, explicitly recognises that sub-national entities (i.e. regional and local government institutions) have an essential role to play in achieving sustainable development (Parnell 2016; Watson 2016). For Germany, which has a federal structure, this results in the need for political action at all federal levels. The objectives of both agendas are strongly influenced by their history of origin, both in terms of content and structure. In each case, it was national actors who derived corresponding objectives for sub-national levels with a view to global challenges. While the previous chapter outlined the basic features of the federal division of labour in Germany with regard to sustainability policy, the following sub-chapter deals with the goals and strategies that individual federal levels pursue with their respective sustainability policies relevant for the implementation of the New Urban Agenda in Germany.

2.2.1 Sustainability Strategy of the Federal Government

The new German Sustainable Development Strategy has a cross-policy area function with regard to sustainability issues in Germany. Launched by the Federal Government in 2016 as a new iteration of the 2002 version and updated again in 2018 and 2021, it is a domestic implementation programme for the 2030 Agenda. The sustainability strategy shows how the 17 SDGs are to be implemented across various fields of action within the next ten years. At its core, is an understanding of sustainability developed by the Brundtland Commission in 1987. This states that sustainable development is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, "Brundtland Commission", 1987 cited in Federal Government 2016: 24). By defining differentiated goals and metrics, this understanding of sustainability is applied to various fields of action for the 2030 Agenda and framed with the following target image in the German Sustainable Development Strategy: "A "sustainable" Germany must be a progressive, innovative, open and liveable country. It is characterized by a high quality of life and effective environmental protection. It integrates, is inclusive and does not exclude, creates opportunities for equal participation of all people in all areas and at all levels. It fulfills its international responsibility."

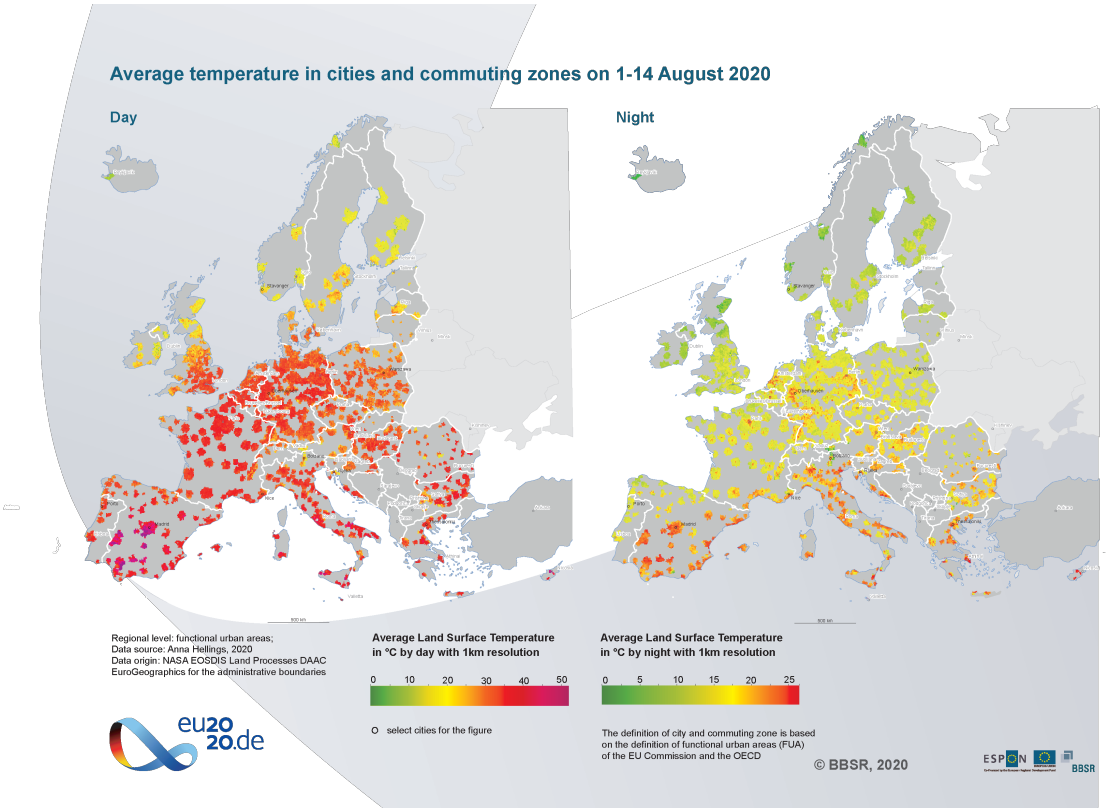
A merit of the 2030 Agenda and the updated German Sustainable Development Strategy, which was first adopted in 2002 to implement the resolutions of the UN Conference in Rio in 1992 and has also led to many pioneers at the municipal level (see Chapter 2.2.3), is the strengthened development of an integrated and comprehensive perspective on ecological, economic and social sustainability issues. Policy programmes in Germany, have already addressed many of the related fields of action, including the topics of climate protection and climate adaptation, which have been the subject of corresponding measures since the mid-1990s. This began with the climate summit in Berlin in 1995, at which Germany committed in a voluntary agreement to reduce carbon dioxide (CO_2) by 25% by the year 2005 compared to 1990. Another milestone was the "Climate Agenda 2020: Transforming Industrial Society" of 2007, which envisaged a 40% reduction in harmful GHG emissions by 2020. The associated reduction of 270 million tonnes of CO_2 was to be achieved in eight areas of action. In November 2016, the German government then adopted the Climate Protection Plan 2050, which envisages a reduction of GHG emissions in Germany by at least 55% by 2030 compared to 1990 levels.

In addition to the development and implementation of individual policy programmes, the process of adopting the 2030 Agenda has increasingly forced emergence of an integrated perspective that takes equal account of environmental and urban development concerns. "The Relocation of Mankind", which the German Advisory Council on Global Change (WBGU) presented in 2016, has also produced ground-breaking preliminary work in this regard. Similarly relevant is the Integrated Environmental Programme 2030 (IUP), developed between 2014 and 2016 in an interdepartmental discussion and coordination process at the then Federal Ministry for the Environ-

ment, Nature Conservation, Building and Nuclear Safety (BMUB). Five priority thematic areas were defined, all of which are located at the interface between the two policy areas, thus environmental and urban development policy, and require corresponding coordination. These include the topics "Environmentally and climate-compatible management, energy and resource transition" (1.); "Sustainable agriculture, intact nature" (2.); "Sustainable mobility, liveable cities" (3.); "Healthy living conditions" (4.); and "International dimension of environmental policy" (5.). In addition to presenting the positive results that Germany has already achieved in the past decades in each of these priority areas, the IUP identifies challenges and tasks for the coming years. Guiding goals and concrete measures requiring interdisciplinary dialogue and suitable coordination mechanisms were formulated in order to coordinate overlapping content between the two policy fields illustrated as follows:

- Key Objective II: "Continue and further develop climate protection and energy system transformation" of the thematic priority "Environmental and climate-compatible management, energy and resource transformation." This provides, for example, for the measures of a Climate Protection Plan 2050, a nature-compatible expansion of renewable energies, a socially and regionally compatible end to coal-fired power generation, and an intensification of climate-friendly construction and housing. Many of these measures, some of which have already been introduced, directly affect the municipalities. Against this backdrop, the active involvement of relevant specialised administrations, at the federal level as well as the local municipal level, is indispensable.
- Key Objective II: "Protect and sustainably use biodiversity" of the thematic priority "Sustainable agriculture, intact nature." This proposes as a concrete measure, a further development of the legal framework and a strengthening of enforcement in the field of soil protection. This not only applies to environmental damage caused by agriculture in the more rural regions, but soil protection is also an issue in cities, especially in the conversion of old and known brownfield and commercial sites. Cities face similar challenges with regard to the measure "Implementing the Nature Conservation Offensive 2020". For in cities, too albeit to a lesser extent than in rural areas, the issue arises in the context of escalating competitive land use as to which areas remain designated as green and natural conservation areas and which can be declared as such. Moreover, the pressure of housing demand that goes unmet in cities often leads to housing projects on the outskirts of the city or in the wider hinterland. In the case of extreme demand, the instrument of external development can be used in accordance with Paragraph 13a and b of the German Building Code (BauGB). Most of the rezoning to residential land there is done at the expense of agricultural land.
- Key Objective II: "Developing cities, municipalities and infrastructures in an environmentally sound manner" of the thematic priority "Sustainable mobility, liveable cities." This objective features various measures that interface most obviously with urban development policy, for example in the proposed implementation of ambitious land protection projects or with regard to urban climate adaptation measures and heat action plans (see also Figure 5). The integration of aspects of environmental and urban development is also clearly evident in the proposals for anchoring the life-cycle cost approach and sustainability standards in construction as well as the development of a strategy for integrated, resource-efficient and resilient infrastructures.

Fig. 5: Average temperature in city and commuting zones from 1-14 August 2020



Source: BMI, BBSR 2020

With the Integrated Environmental Programme 2030, the BMUB took stock of the substantive and technical interfaces of environmental policy with urban development issues, but interrelationships with various other policy fields, in particular with economic, financial, transport, agricultural and housing policy, were also addressed. In addition, the IUP contains a comprehensive catalogue of measures that are to be implemented both legislatively and administratively in the coming years so that Germany can meet its international commitments in the areas of environmental, natural species and resource protection.

Another example of successful interdisciplinary cooperation is the development process for the White Paper "Stadtgrün – Grün in der Stadt – Für eine lebenswerte Zukunft" (Urban Green – Green in the City – For a Liveable Future), which was presented by the then BMUB at a congress of the same name in June 2015. It contains considerations for intensifying integrated planning of green spaces and the greening of buildings in the city towards strengthening urban climate protection and climate adaptation. A participatory bottom-up approach involving urban society is recommended (BMUB 2015). The process for this White Paper also initiated structures for exchange between the various institutions of the federally owned departmental research facilities (BBSR, BfN and UBA), which continue to exist. The implementation of the White Paper thus continues to build a for further and increasingly intensive cooperation between these institutions.

Among the climate policy programmes, the National Climate Initiative (NKI) is particularly striking as a national framework programme for climate protection measures at various levels and in various fields. It was launched by the German government in 2008, to promote climate protection locally, with the involvement of municipalities, businesses, consumers and civil society through various individual programmes. From 2008 to the end of 2020,

more than 35,500 projects with a total investment volume of around 3.9 billion euros were implemented, resulting in a reduction of GHG emissions by 29.2 million tonnes of CO_2 equivalents (13.9 million metric tons of CO_2 equivalents net over the impact period from investment projects, 15.3 million metric tons of CO_2 equivalents gross over the impact period from non-investment projects) (BMU 2021). The overarching goal is to make the Germany climate neutral by 2050. This central approach of the NKI already illustrates the strong municipal orientation of the entire initiative: counties, cities and municipalities are allocated a key role in achieving the Paris climate protection goals. In effect, this is to be promoted with a large number of targeted sub-programmes, which include the municipal guidelines, the cold climate guideline, the promotion of climate protection through cycling and the funding call for exemplary municipal climate protection projects.

The large number of support programmes mentioned above takes into account the fact that climate protection is a voluntary task of the municipalities. Voluntary tasks are usually postponed due to budgetary inflexibility of the Länder and municipalities, that have been little changed by the general government's positive revenue developments in recent years. This also applies to investment measures in the field of climate protection and climate adaptation. Above all, the one quarter of all municipalities that work under the conditions of a budget protection concept and thus under the curatorship of the municipal supervisory authorities, have particular difficulties in mobilising voluntary tasks. Programmes of the National Climate Initiative provide municipalities important financial incentives for stimulating their investment activities towards achieving internationally agreed threshold values. Changes in the focus of the programmes made by the federal legislature over the past ten years are an expression of progress in the field of environmental, energy and transport technologies: as knowledge about environmentally damaging infrastructures and everyday practices grows, so does a market for the development of alternative technologies. This illustrates the close connection between environmental and urban development policy. After all, many environmental and climate protection measures are associated with sometimes drastic interventions in public urban infrastructures and social habits. The resulting conflict of goals and interests therefore, often requires urban planning to be embedded in the respective neighbourhood framework or even the overall urban context. It is here that to some extent deficits of the federal government's environment and climate-related funding programmes become apparent: In contrast to the Kommunalrichtlinie (Local Authorities Guideline) of the National Climate Protection Initiative, the strategic and urban planning components of such measures are often neglected by strongly focusing on technology and infrastructure. In order not to continue implementing selective and project-related climate protection measures according to the "supply situation" of the federal government funding programmes, as well as embed them in longer-term strategies for the "transformation of cities" (WBGU 2016), a sufficient and steady flow of resources is needed. Medium-sized and small municipalities in particular – particularly those that are financially weak – often lack the staff to effectively apply for and implement suitable measures from the multitude of funding programmes.

2.2.2 Sustainability strategies of the Länder

In addition to the federal government's various measures, 14 German federal states (Länder) now have their own sustainability strategy. Most of these align with the goals of the 2030 Agenda or will be further developed in the coming years. Overall, the sustainability strategies express the guiding principle of sustainable development and establish a link between social justice, economic feasibility and ecological responsibility. The individual thematic fields in the respective sustainability strategies of the federal states have quite different emphases. The federal states of Bremen and Mecklenburg-Western Pomerania do not yet have sustainability strategies, but intend to develop relevant approaches (Federal Statistical Office (DESTATIS), n.d.). Each of the sustainability strategies of the Länder are briefly outlined in alphabetical order below: (see tabular overview in the appendix).

Baden-Württemberg: Baden-Württemberg adopted a sustainability strategy as early as 2007, and the state government relaunched it in 2011. The latest report was presented in 2016 and contains 47 objective indicators as well as six subjective indicators (ibid.). The subjective indicators in particular aim to capture challenges specific

to municipalities and to provide a more comprehensive understanding of the state and municipal level. Municipalities with less than 5,000 inhabitants are otherwise especially difficult to reach (Lehle, in: Hannes 2017). The responsible department is the Ministry for the Environment, Climate and Energy Management of Baden-Württemberg. (Baden-Württemberg, n.d.).

Bavaria: The Bavarian state government has made sustainability, with a special focus on intergenerational justice, the long-term framework for the development of Bavaria. The Bavarian sustainability strategy ties in with the action programme "Sustainable Development Bavaria" from 2002 and the local Agenda 21 from 1997. The draft version of the Interministerial Working Group was presented to the public for discussion in a dialogue process and, after subsequent revision, was adopted by the Council of Ministers in 2013 (Bavarian State Ministry of the Environment and Public Health (StMUG) 2013). The Bavarian Sustainability Strategy was updated in 2017 and now also includes the contents of the SDGs as well as 27 environmental indicators.

Berlin: A core indicator report on Berlin's sustainable development was first presented in 2012. With the second core indicator report of 2014, the Senate Department for Urban Development and the Environment, together with the Berlin-Brandenburg Statistics Office, launched continuous data-based sustainability reporting in Berlin. Instead of an overarching strategy, sustainability approaches were summarised in 2016 in the so-called Berlin Sustainability Profile. Municipal strategies, plans and concepts were analysed for this purpose. The result is profiling fields and guiding brands that are intended to show what the implementation of the numerous already existing Berlin plans, strategies and concepts can be oriented towards in order to make the city as effective as possible for the future with the available resources.

Brandenburg: The Brandenburg state government decided in 2010 to set up a sustainability strategy., After a series of public dialogues it was adopted in April 2014, with five key topics (capital region economy and work; liveable villages and cities; Brandenburg as a model region for energy transition and climate adaptation; sustainable financial policy; and education and sustainable development). The first implementation progress report with 49 sustainability indicators and a continuing draft version of the sustainability strategy followed in 2017. The Ministry of Rural Development, Environment and Agriculture (MLUL) is the responsible department (Federal Statistical Office (DESTATIS), n.d.; RENN, n.d.).

Hamburg: In Hamburg, the United Nations Sustainable Development Goals have been proposed for implementation since 2017. After an initial stocktaking of the inter-agency working group, the Department of Environment and Energy in cooperation with the Statistical Office North (Federal Statistical Office (DESTATIS), n.d.) will take responsibility for a two-year reporting cycle that examines the SDGs for Hamburg taking into consideration overlaps between Senate policies and the goals of the 2030 Agenda. Four thematic groups were formulated for further in-depth work, as follows: Environment and City, Participation and Social Cohesion, Sustainable Economic and Financial Policy, Education and Science.

Hesse: The impetus for the Hessian sustainability strategy was the European sustainability strategy in 2008. Targets and indicators were developed in a participatory process and implementation projects were realised. The first indicator report was published in 2010. Progress reports with target and reporting indicators were formulated for a two-year cycle (RENN, n.d.). With a view to the 2030 Agenda, targets and indicators are continuously under development. The coordinating body is the Sustainability Strategy Office. Since 2019, the Hessian Alliance for Sustainability (HBN), supported by various steering committees, has acted as the decision-making body for the Hesse Sustainability Strategy (Federal Statistical Office (DESTATIS), n.d.; RENN, n.d.).

Lower Saxony: As early as the 1990s, implementation of Agenda 21 has been promoted in Lower Saxony and made a topic of state policy. In 2008, a preliminary sustainability strategy was formulated, followed in 2016 by revisions and defined concrete focal points and goals. Interested parties were given the opportunity to participate in a public process. In 2017, the state government finally adopted the sustainability strategy including 60 indicators (Federal Statistical Office (DESTATIS), n.d.; RENN, n.d.).

North Rhine-Westphalia: North Rhine-Westphalia has been conducting preliminary work on a state sustainability strategy for several years. After the 2005 change in government in 2005, efforts were halted. (Boysen, 2010: 106). Thus, the first sustainability strategy comprising 70 indicators was adopted for North Rhine-Westphalia in 2016 after a two-year consultation process, making NRW the first federal state to address all SDGs (Federal Statistical Office (DESTATIS), n.d.; RENN, n.d.).

Rhineland-Palatinate: Rhineland-Palatinate implemented a sustainability strategy with an integrated and complete set of indicators as early as 2005, closely following Agenda 21 (Boysen 2010). The indicator report is produced every two years by the Rhineland-Palatinate Statistical Office.

Saarland: A sustainability strategy led by the Ministry of the Environment and Consumer Protection was derived in 2016 from the 2004 environmental programme and the state programme for the implementation of Agenda 21. It contains six fields of action with a total of 39 indicators. Shaped by a participatory development approach, with the meaning of sustainability discussed in an online survey and results incorporated into the sustainability strategy (Boysen, 2010; Federal Statistical Office (DESTATIS), n.d.).

Saxony: The Free State of Saxony, has had a sustainability strategy since 2016. It was further developed in 2018 and addresses a total of nine fields of action, also in conjunction with the 2030 Agenda. All ministries including the State Chancellery contributed to developing the strategy under the coordination of the Saxon State Ministry for the Environment and Agriculture and are jointly responsible for its implementation. Numerous comments resulting from the public participation process of recent months that included citizens, associations, companies and institutions have been incorporated into the strategy. For the first time since 2016, there has been a sustainability report with 31 indicators (ibid.).

Saxony-Anhalt: The Ministry for the Environment, Agriculture and Energy published a preliminary comprehensive sustainability strategy and indicator report for Saxony-Anhalt in 2014. In 2016, a new edition adapted to the 2030 Agenda and the German Sustainable Development Strategy was published (Federal Statistical Office (DESTATIS) (ibid.).

Schleswig-Holstein: In 2016, the new state development strategy was adopted, it is oriented towards the global sustainability goals. Since 2017, the State Chancellery and the Ministry for Energy Transition, Agriculture, Environment and Rural Areas of Schleswig-Holstein (MELUND) have been developing long-term indicators (German Federal Statistical Office (DESTATIS) (ibid.).

Thuringia: Thuringia has had a sustainability strategy since 2011. The current sustainability strategy from 2018 maps sustainability in 5 thematic fields, that are linked to the SDGs and supported by indicators. The first indicator report with 27 indicators was published in 2012, a second followed in 2017 (ibid.).

Analysis of federal states' sustainability strategies reveals that they already form an integral part of the respective state policies. In addition, the principle of sustainability has been elevated to a central criterion for examining and deciding on governmental and administrative action, particularly in the states of Baden-Württemberg, Berlin, Hamburg, Lower Saxony, North Rhine-Westphalia and Saxony-Anhalt. In its sustainability strategy, Lower Saxony also addresses the discrepancy between the theoretical formulation of a guiding principle and constitutional practice and has formulated the claim to translate target formulations and descriptions of measures into concrete, long-term and transparent political action accordingly (Bundesregierung 2020a).

In comparing the federal states' different sustainability strategies, it becomes clear that the concept of participatory development plays a special role in the negotiation and elaboration stage of the process. In addition to broadly based online surveys (Thuringia), public dialogues (as in Brandenburg, Bavaria, Hesse and Saarland, among others), citizens' congresses (as in Schleswig-Holstein) and public meetings (as in North Rhine-Westphalia), extensive information and public relations efforts occur (in Hesse and Schleswig-Holstein, among others). Ham-

burg, in particular, stands out as working to increasingly share information and expand participation opportunities in urban development projects (www.hamburg.de/stadtwerkstatt/). In contrast, the state of Hesse, for example, focuses on initiatives that involve youth in the context of design, implementation and communication.

Overall, the principle of sustainability is understood by the federal states in a multidimensional way and communicated accordingly. In this context, the Länder point out the challenges that are directly associated with the promotion of sustainable development processes for politics, society and the economy – especially if, according to the three-pillar logic of the sustainability approach, this can only be achieved if ecological, economic and social concerns are implemented equally and equitably. As such, the federal states address between five and eleven points for action in their respective sustainability strategies. Of primary importance are the thematic areas of education, energy and climate, as well as sustainable economy and consumption. The vast majority of the federal states strive for sustainable development in the area of education, research and science. This area is supplemented by the topics of "innovations" (Schleswig-Holstein) and "lifelong learning" (Thuringia). Of similar importance is the topic of "(sustainable) energy, climate and climate change". Schleswig-Holstein explicitly mentions flood protection here. This is followed by the topics of "resources" or "conservation and management of natural resources" and "environmental protection and nature conservation" as well as "sustainable economy and consumption" which is frequently mentioned. Of second highest importance in the thematic fields addressed by the sustainability strategies of the federal states are the topics "sustainable mobility", "health and nutrition" and "sustainable financial policy". With regard to the social level, "social cohesion and social participation" as well as "social inclusion" are named as fields of action (Bavaria, Hesse, Lower Saxony and North Rhine-Westphalia), but topics such as "gender equality" (North Rhine-Westphalia) and the "reduction of inequality" (Thuringia) are only singularly considered in the state strategies. The topics "global responsibility and networking" (Bavaria, Hamburg and North Rhine-Westphalia) and "land management and forestry" (NRW, Saxony-Anhalt and Thuringia) play a subordinate role. Digitalisation is only formulated by Schleswig-Holstein as an area of action for sustainable land development.

The sustainability strategies of Baden-Württemberg, Bavaria, Brandenburg, Hesse, Lower Saxony, North Rhine-Westphalia, Rhineland-Palatinate, Saxony-Anhalt, Saarland, Schleswig-Holstein and Thuringia – i.e. of eleven federal states – are directly aligned with the SDGs of the 2030 Agenda. Saarland and North Rhine-Westphalia in particular, are leading the way. Saarland was the first federal state to include the SDGs into the structural basis of its sustainability strategy. North Rhine-Westphalia, on the other hand, was the first federal state to address all SDGs with its system of targets and indicators. In line with the federal states' fields of action, SDG 7 "Affordable and clean energy", SDG 12 "Sustainable consumption and production" and SDG 13 "Climate protection measures" in particular appear to be focal points. SDG 1 "No poverty", SDG 5 "Gender equality", SDG 10 "Reduced inequalities" and SDG 14 "Life below water", on the other hand, are given little consideration.

The numerous ongoing revisions and new editions of the sustainability strategies suggest that the federal states are concerned with successively implementing the SDGs and adapting indicator and measurement systems accordingly, so that future challenges can be responded to adequately and at an early stage. Berlin stands out in particular, in the implementation of the National Sustainability Strategy. The federal state supplements the methodological approach with an implementation roadmap (Berlin.de, n.d.). Furthermore, in 2019, the Federal Government and the Länder reaffirmed their commitment to sustainable development in a joint declaration. In the paper "Together for sustainable development – with responsibility for a good future in Germany, Europe and the world", the interaction of all levels is emphasised, the orientation towards the principles of the German Sustainable Development Strategy is reinforced and the role of all actors in the transformation towards a sustainable Germany is highlighted. Networking and support for local and regional actors is provided by the Regional Network Hubs for Sustainability Strategies (RENN), which were established by the German Council for Sustainable Development (RNE) at the request of the German government and are represented in all 16 German states. In addition, Brandenburg has set up a sustainability platform that serves to network various actors and enable imple-

mentation of the sustainability strategy, while taking into account specific local conditions. Similar institutions also exist in the following Länder (Federal Government, n.d.):

- Hamburg: Hamburg Sustainability Forum as a platform for civil society
- Hesse: Sustainability conference
- Lower Saxony: Lower Saxony Council for Sustainability
- NRW: Interministerial working group with the participation of all ministries (IMAG Sustainability Strategy)
- Rhineland-Palatinate: regular consultations within the state government
- Saarland: Interministerial Coordination Group
- Saxony: Interministerial Working Group (IMAG Sustainability)
- Saxony-Anhalt: Temporary Interministerial Working Group on Sustainable Development
- Schleswig-Holstein: Involvement of the ministries
- Thuringia: State Secretary Working Group on Sustainable Development (STS-AG NE), Interministerial Working Group on Sustainable Development (IMAG-NE)

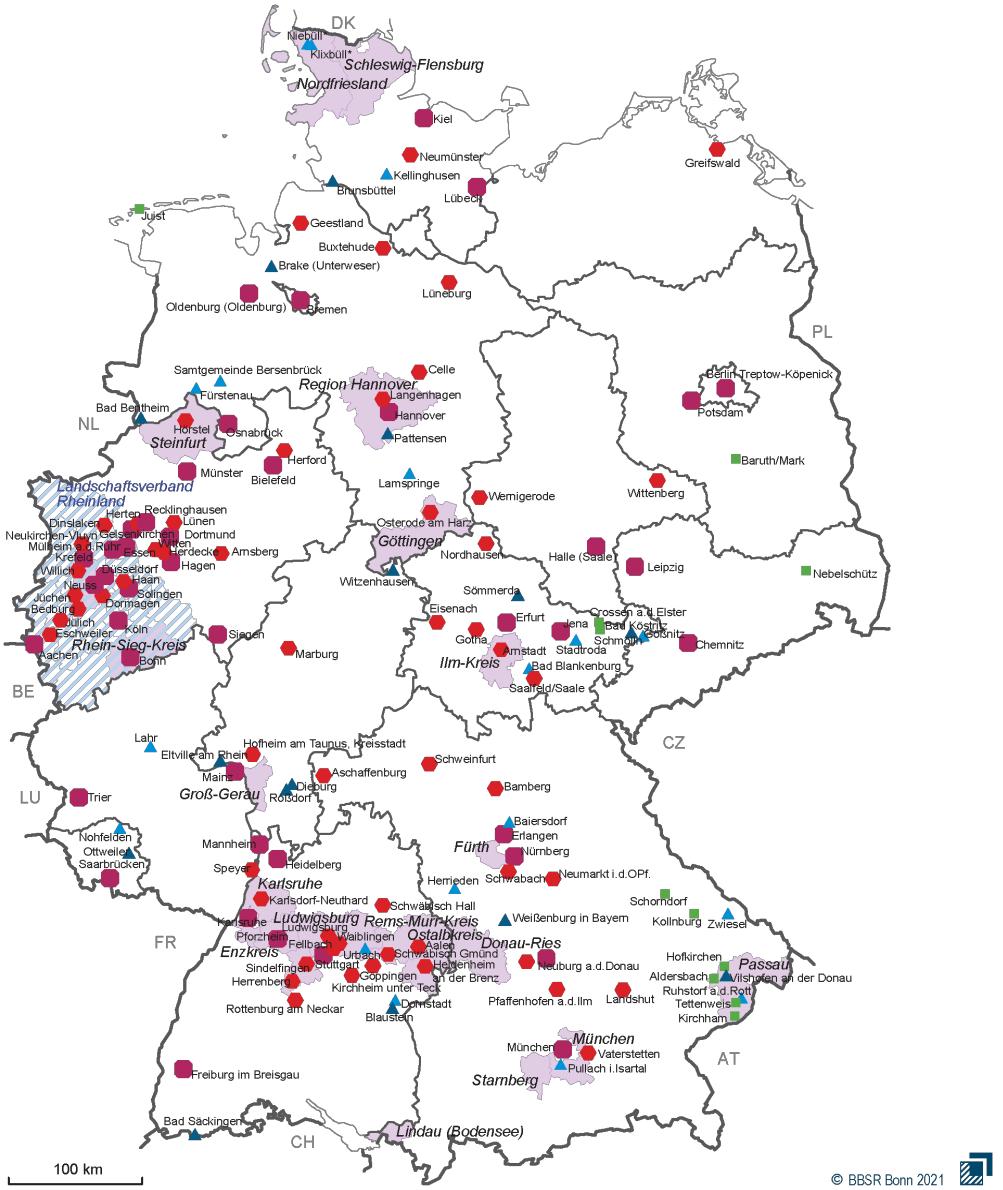
2.2.3 Sustainability strategies in the Club of Agenda 2030 Municipalities

The diversity of the above-mentioned institutions illustrates that the federal states are making enormous efforts to coordinate and integrate the various working levels and actors in the field of sustainability. A holistic approach is thus being pursued in order to operationalise the recommendations for action of the sustainability strategies at the various levels. With regard to vertical integration, some federal states focus primarily on the municipal level (e.g. Baden-Württemberg, Berlin, Lower Saxony, North Rhine-Westphalia and Thuringia). Only recently, the state of Lower Saxony has dealt with the implementation of the sustainability strategy at the municipal level. Among other things, municipal sustainability model projects are being implemented in cooperation with the Leuphana University of Lüneburg (Federal Government 2020a). In Thuringia, mayoral dialogues are held to open up the discourse and strengthen sustainable action at the municipal level (Federal Government 2020b). In North Rhine-Westphalia, municipalities can participate in the LAG 21 project "Globally Sustainable Municipalities in NRW" (GNK NRW). So far, the programme is divided into two project periods (2016-2018 and 2019-2021). A total of 30 NRW municipalities are being supported in developing their strategy for globally sustainable development (LAG 21, n.d.).

Many municipalities in Germany have been involved in local sustainability processes for some time, prompted not least by Agenda 21, which was adopted by the United Nations in 1992 and found its way into the cities, municipalities and counties with individual contributions under the motto "Think globally – act locally! While in some cases politics and administration provided the impetus, many municipal sustainability processes in Germany also arose from citizen initiatives and were primarily supported by their voluntary participation. For some years now, increasing numbers of municipalities have been bringing an existing commitment to municipal sustainability strategies and concepts, which are generally based on a moderate sustainability approach. However, the depth of development varies considerably: while some municipalities focus on exemplary sustainability measures, other municipalities define targets and regularly review the degree of target achievement (Bertelsmann 2016).

One contribution to the harmonisation of processes is made by the Club of Agenda 2030 Municipalities. This comprises cities, municipalities and counties that have signed the model resolution "2030 – Agenda for Sustainable Development: Shaping Sustainability at the Municipal Level" of the German Association of Cities and Towns and the Council of European Municipalities and Regions (CEMR). More than 160 cities (as of December 2020; see Figure 6) have thus committed to the implementation of the 2030 Agenda and the 17 global Sustainable Development Goals of the United Nations since 2015. Participating municipalities are also asked to take optional measures in three thematic focus areas: Information and awareness-raising, networking and advocacy measures, and transferring the 2030 Agenda to the municipal level. At annual networking meetings, municipal representatives learn about the implementation status of the 2030 Agenda at the local level.

Fig. 6: Municipal signatories of the specimen resolution on the 2030 Agenda



Municipal signatories of the specimen resolution „The 2030 Agenda for Sustainable Development: Building Sustainability at the Local Level“ of the Association of German Cities and the German Association of the Council of European Municipalities and Regions as of December 2020

according to BBSR types of municipalities	number
large cities (100,000 inhab. and more)	42
medium-sized towns (20,000 up to below 100,000 inhab.)	56
smaller-sized towns (10,000 up to below 20,000 inhab.)	15
small towns (5,000 up to below 10,000 inhab.)	18
rural municipalities	11
counties	22
associations	1

*Niebüll and Klixbüll are communities in Südtondern, which is classified as a small town.

Source: Engagement Global gGmbH - Service Agency Communities in One World (SKEW), Spatial Monitoring System of the BBSR Geometry: municipalities and counties (generalised borders), 31/12/2019 © GeoBasis-DE/BKG Author: A. Milbert

Source: BBSR 2020

The German Council for Sustainable Development (RNE), first appointed by the Federal Government in 2001, has also facilitated an exchange of sustainability processes in municipalities since 2010 with its "Sustainable City" dialogue. Under the motto "Sustainability needs leadership", the mayors of more than thirty German cities meet regularly and exchange views on strategies and measures for sustainable development. With joint statements and position papers such as "In Our Hands: Strategic Cornerstones for Sustainable Development in Municipalities", they provide important impulses for municipal sustainability policy and sustainable urban development in terms of federal policy.

2.2.4 Interim conclusion

The overview of individual sustainability strategies and approaches of the federal government, states and municipalities illustrates that awareness of sustainability issues in politics and the public in Germany, has grown significantly in the last five years and is now also expressed in various guiding principles and approaches that are being continuously developed. However, the federal organisation of expertise means that individual administration levels are autonomously active in this field. Asa consequence of this structure, strategies and indicator systems develop from different reference systems creating a diverse range of individual thematic emphases and focal points. Despite various coordination efforts, sustainability monitoring by the federal, state and local governments is also still in its infancy. This means that systematic and multi-level comparisons are often constrained due to the lack of or incompatibility of statistical data. In the future, it will become clear to what extent coordination between the different administrative levels can be strengthened and, if necessary, also promoted through inter-level programmes in order to effect sustainability management at the different levels.

2.3 Urban development policy in the Federal Republic of Germany

2.3.1 Legal framework conditions

In the Federal Republic of Germany, urban development policy derives from the expertise of several branches of government, and as a result extends across various legal sources. These include the Federal Building Code (BauGB) – and in particular Chapter 2 "Special Urban Development Law", which was last amended in 2017. Pursuant to Article 74 (1) of the Basic Law, the legislative competence for the Building Code lies with the federal government, which is responsible for "urban development land transactions, land law (excluding the law on development contributions), and housing subsidy law, old debt assistance law, housing subsidy law, miners' housing law and miners' settlement law". Other legal sources of relevance to urban development policy include the Regional Planning Act (ROG), which also falls within the scope of existing federal legislation, the Act on Protection against Harmful Effects on the Environment Caused by Air Pollution, Noise, Vibrations and Similar Processes (Federal Immissions Control Act (BImSchG)), and the Ordinance on the Use of Land for Building Purposes (Baunutzungsverordnung (BauNVO)). At the level of the Länder, of particular relevance are, among others, the Land planning laws, the Land spatial planning and development programmes, as well as the building regulations of the 16 Länder, which are based on the model building regulations of the Ministries of Construction Working Group (ARGEBAU) (BBSR 2000: 3). The federal government supports urban development measures of the Länder and municipalities with various funding programmes. Of significance here is the administrative agreement on urban development funding to be concluded annually between the federal government and the Länder (see Chapter 2.5).

The extent to which urban development policy in the Federal Republic of Germany is now considered part of a comprehensive sustainability policy and thus intended to contribute to the implementation of the New Urban Agenda and the 2030 Agenda becomes clear from the fact that the majority of the relevant legal provisions also contain – explicitly or implicitly – environmental and sustainability-relevant requirements. For example, the new Paragraph 1a of the 2013 amended BauGB ("Supplementary provisions on environmental protection") obliges –

in the spirit of the New Urban Agenda (Paragraphs 51 and 69) – the economical use of land and, with reference to the Federal Nature Conservation Act, any compensatory measures for preserving the performance and functionality of ecological balance. Since 2017, the preamble to the Administrative Agreement on Urban Development Funding has also included aspects that are particularly relevant for the sustainable transformation of cities (cf. here in particular preamble points II.2 to 4). Aspects to be given special consideration are as follows: 2). “the requirements of climate protection and adaptation to climate change, including energy renewal in neighbourhoods; 3). the importance of green and open spaces in cities and municipalities for environmental, climate and resource protection, biodiversity, health and social cohesion in urban neighbourhoods; 4). the requirements for adapting infrastructures in a needs-based way [...]".

Municipalities have a range of planning tools at their disposal for their urban development policy, most of which are designed for medium to long-term planning goals. These include – in addition to land use, project and development plans as well as zoning plans – e.g. integrated urban development concepts (ISEK or INSEK), urban development plans or programmes and county development plans as well as individual sectoral plans, such as transport development and noise reduction plans as well as economic, housing and cultural development plans. In addition, many municipalities now have their own climate protection programmes and local sustainability strategies. Coordination of these different sub-plans and strategies can be challenging for the various specialised administrations of the municipalities. Nevertheless, a large number of municipalities are endeavouring to strategically organise urban development as an integrated process. At the same time, the effects of so-called "glocal" trends, such as climate change, demographic change and digitalisation, which are becoming increasingly noticeable at the municipal level, are creating new needs for the transformation of urban infrastructures. As part of this constant change, urban policies and governance approaches must also be constantly realigned and adapted. The methods of urban development are diverse in this respect. In addition to continuous monitoring and benchmarking of individual aspects of urban and neighbourhood development on the basis of (statistical) control indicators, population forecasts, demand and trend analyses of public services, scenario techniques, policy analyses, but also planning forums and quantitative and qualitative methods of citizen participation are important approaches.

In addition to managing vertical and horizontal interfaces in the federal multi-level system, municipalities are increasingly cooperating and "co-producing" with non-state actors from business and civil society to deliver their public services (Nabatchi, Stehen, Sicilia, Brand 2016) – in some places this occurs somewhat hesitantly and informally. This may be particularly true where it has not yet been possible to achieve the potential benefits and opportunities of a collaborative approach to sustainable urban development and therefore the challenges associated with a strongly participatory or co-productive approach, such as slowing down administrative and planning processes, are superficial. Conflict resolution and interest reconciliation between the public and private sectors have a long tradition in the city. With an increasing sensitivity to urban concerns among members of the public, citizens' participation rights have been successively expanded and formalised. In addition, the change in the understanding of administration in the course of the establishment of the "New Control Model" as a German expression of the New Public Management approach since the early 1990s, also initiated a "participatory turn." In addition to participation in urban land use planning processes for (large-scale) infrastructure projects, citizens can increasingly participate in the preparation of integrated urban development concepts (ISEK), urban model processes or participatory budgets. All in all, governance processes at the local and regional level are now characterised by complex coordination requirements in terms of content as well as institutional and procedural aspects, since conflicts of goals and interests that span different disciplines and periods must increasingly be reconciled (Holtkamp 2007; Fürst 2007).

2.3.2 Characteristics of the policy field of urban development

Urban development policy is a multi-sectional policy field that aims at the further development of the urban area as a whole and/or its neighbourhoods individually, through coordination of various individual policies. In doing so,

the spatial, structural and social conditions of individual cities and municipalities must be taken into account, both in their historical genesis and in their regional characteristics. In addition to economic, labour market and social policy issues with local or regional relevance, a variety of aspects, such as housing, land, transport and environmental policy as well as monument preservation concerns of the cities and municipalities must be coordinated and unified. The National Urban Development Policy has existed as a joint task in Germany since 2007.

Urban development therefore always aims at balancing diverse concerns and interests within the framework of city-wide or neighbourhood-related planning processes as well as the promotion and implementation of development measures. The framework for these processes and measures is usually a politically approved urban development concept, which is often developed or updated with public participation. Regulatory requirements, such as the Federal Building Code or the Land Building Codes, serve more as a legal framework that, at least with regard to questions of urban development funding and urban development, marks the limits for relevant processes, and serves less as an instrument for enforcing certain interests – even if both legal sources contain such standards, especially for building construction and civil engineering. The state thus intervenes in private decisions through urban planning processes only to the extent necessary to channel urban growth.

In urban development processes, compromises have to be made across economic, social and ecological interests as well as notions of sustainability. This is exemplified by the issue of land use and consumption, which is becoming increasingly destructive in the course of rapid urbanization. It makes sense therefore for such issues to be addressed by the New Urban Agenda (Paragraphs 51 and 69). In addition to job creation through new businesses in designated commercial areas and the construction of housing, providing sufficient local recreation areas for the growing number of people in the municipalities is equally important, especially since these typically contribute as "green corridors" to the urban microclimate and thus to climate adaptation. Many cities are in fact developing official green space concepts, by anchoring them in urban land use planning or green statutes. They continue to suffer however, from the challenge of political commitment to these regulations, as it is not uncommon for economic interests to lead to individual trade-offs in which ecological and social public welfare concerns take second place to those private interests in favour of costly infrastructure projects.

Urban development policy tends to often rely on a comparatively established and stable network of stakeholders and experts, with professional discourse, competitions and information campaigns typically shaped by urban and spatial planners and architects; and political debates shaped by local and regional politicians and various academic disciplines. The subjects of these debates extend from the international and national to the local model for urban development, which often define tangible social, economic and ecological goals developed in cooperative and participatory processes with broad participation of the various urban stakeholder groups. An example of this is in the Integrated Urban Development Concepts (INSEK), which are a fundamental prerequisite for funding under the federal urban development programmes, making urban development policy more locally and less internationally oriented, in contrast for example to environmental policy – even though the New Urban Agenda, the SDGs, the Urban Agenda for the EU and the New Leipzig Charter were designed as urban development governance approaches at the international or European level. The New Urban Agenda, the 2030 Agenda with its SDGs, the Urban Agenda for the EU (including the "Pact of Amsterdam", the "Working Programme of the Urban Agenda for the EU", the "Riga Declaration" and the "Toledo Declaration") as well as the Leipzig Charter, the EU's URBACT programme and, most recently, the "European Green Deal" are all programmes designed at the international or EU level. Within the framework of its EU Council Presidency in the second half of 2020, the Federal Republic of Germany promoted a new version of the "Leipzig Charter on Sustainable European Cities", which was adopted in 2007 under Germany's last Council Presidency. The "New Leipzig Charter – the transformative power of cities for the common good" was newly adopted in December 2020 and is a more robust approach to strengthening the "green, just and productive city" in Europe. To this end, the charter identifies five approaches to "good urban governance" which include the common good orientation, the integrated approach, participation and co-creation, multi-level cooperation and the place-based approach.

The Federal Ministry of the Interior, for Building and Home Affairs (BMI) has meanwhile promoted the establishment of various "International City Learning Networks" aimed at strategic urban development through dialogue. These include the "Dialogues for Urban Change (D4UC)" involving cities in Germany and the USA, South Africa and Ukraine, or the "International Smart Cities Network" (ISCN). In the majority of these networks and programmes, regeneration of disadvantaged neighbourhoods through civic and urban stakeholder participation are key points of overlap. Activities also include research alliances across public authorities, as for example the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR) with the National Institute of Urban Affairs (NIUA), which (see above) analyses SDG 11.3.1 data, prepares visual mapping, and formulates evidence-based recommendations for action.

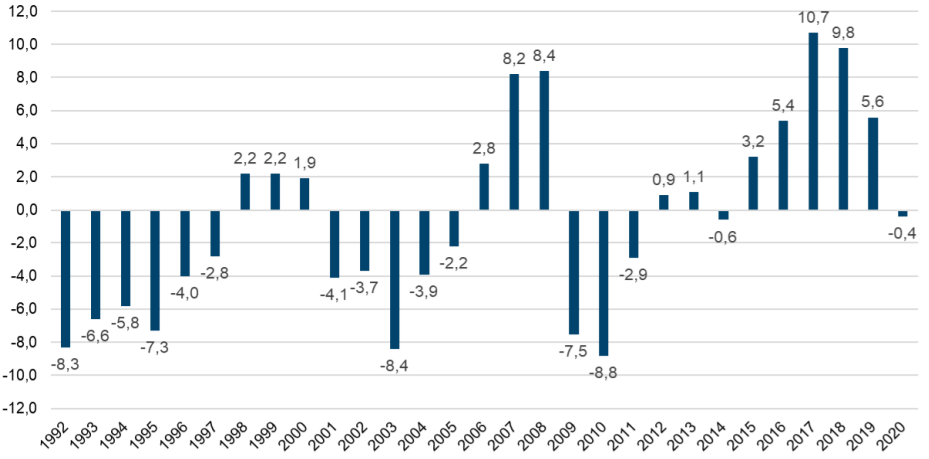
2.3.3 Financial and budgetary framework conditions of the municipalities

A sustainability policy that implements programmes such as the New Urban Agenda or the 2030 Agenda within a multi-level federal system such as the Federal Republic of Germany requires that municipalities have adequate financial resources. The transformation of infrastructure in urban space including the attendant reorientation of planning, administrative procedures and public sector services, are resource-intensive – even when such processes are realised over extensive time periods. Against this background, arise the questions around the municipalities' financial and budgetary situation. The Municipal autonomy guaranteed according to Article 28 (2) of the Basic Law "shall extend to the bases of financial autonomy; these bases shall include the right of municipalities to a source of tax revenues based upon economic ability and the right to establish the rates at which these sources shall be taxed". In this respect, the Länder in particular – to which the municipalities are constitutionally assigned, since they do not form a separate level of government – must ensure that counties, cities and municipalities are adequately funded. The financial strength of a municipality in Germany is measured by the sum of the original and the composite tax revenues (such as income and turnover tax on the one hand and property, trade and petty taxes on the other), the contribution and fee revenues as well as the allocations within the framework of the municipal financial equalisation systems of its cities and municipalities.

In constitutional practice, however, the financial and budgetary situation of the municipalities in Germany (do we need to keep saying the federal republic – we know this is all about the levels of the BRD) has been ambivalent for several years. In 2019, for example, the cumulative financing balance of the municipalities of all Flächenländer (area states) in the core and extra budgets – and thus even before the outbreak of the global Corona pandemic – showed a financial surplus for the fifth time in a row. At €5.6 billion (core and extra budgets) and €4.5 billion (core budget), this was lower than in the previous year, but still well above the average of the past decades (DESTATIS 2020a). The basis for the financing surplus at the municipal level was a continuous overall positive economic situation in 2019. High trade tax and income tax revenues were offset by relatively low social expenditure due to continued high employment, a situation that suffered at the outbreak of the global Corona pandemic and subsequent contact restrictions imposed as a result – even though the complete picture for the public budgets is only slowly becoming apparent.

Fig. 7: Development of the municipal net lending 1992 – 2020

1992-2020 in billions of euros



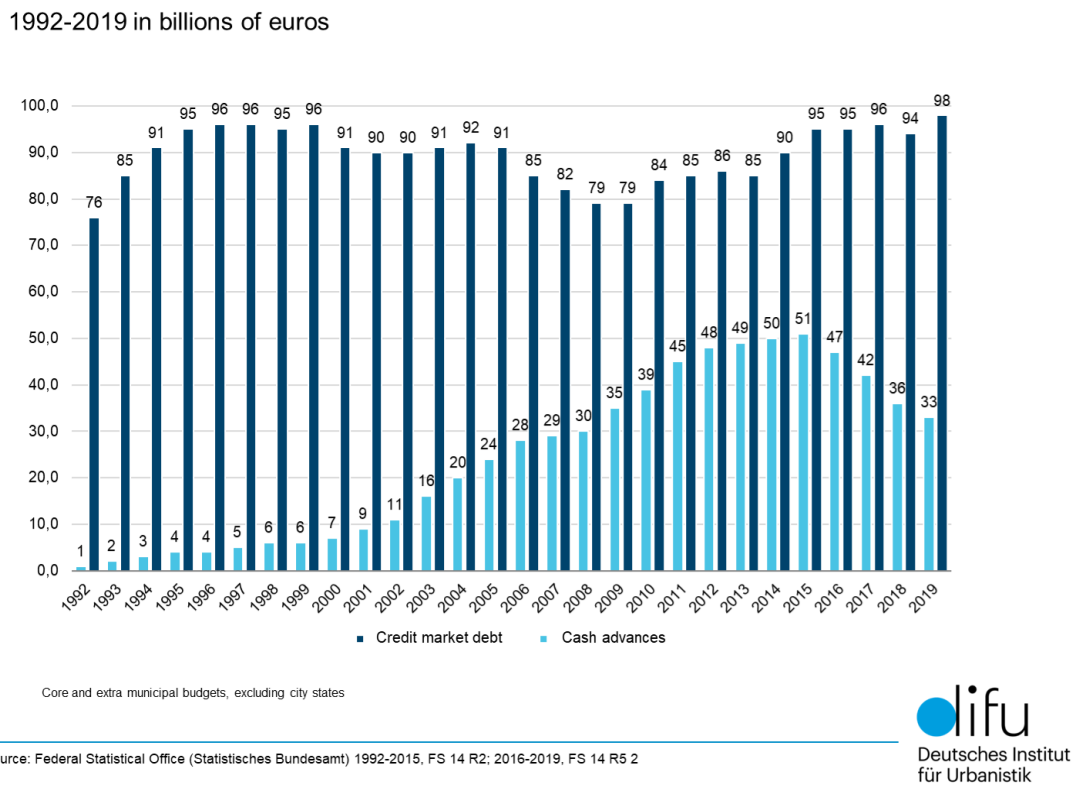
Core and extra municipal budgets, excluding city states; 2020 estimated

Source: Federal Statistical Office (Statistisches Bundesamt), FS 14 R2, German Association of Cities (Deutscher Städtetag) 2020

difu Deutsches Institut für Urbanistik

In addition, some of the municipalities in Germany were already deeply in debt prior to the Corona pandemic and despite the significant fiscal and budgetary recovery of recent years. Of the total of €115 billion with which municipalities and municipal associations were indebted to the non-public sector in the core budget as of 31.12.2019, 72% was accounted for by loans and securities debt and 28% by cash advances, which corresponded to around €32.5 billion (DESTATIS 2020b). In this context, municipal debt in the non-public sector core budget fell minimally in 2019 from €1,512 per capita at the beginning of the year to €1,499 per capita at the end of 2019 (DESTATIS 2020b). The highly uneven distribution of municipal debt – i.e. credit market debt plus loans to secure liquidity (cash advances) – is an indicator of fiscal disparities in an inter-municipal comparison. Even the distribution of credit market debt per capita in the core budgets shows a considerable disparity in the state comparison. At the top – as in previous years – were the counties and municipalities in Saarland (3,419 euros per capita), Rhineland-Palatinate (2,958 euros per capita) and North Rhine-Westphalia (2,597 euros per capita), where the average per capita debt of the municipalities continues to be well above the average for Germany as a whole. In contrast, the lowest per capita debt was recorded by municipalities in the states of Brandenburg (566 euros per capita), Saxony (548 euros per capita) and Baden-Württemberg (494 euros per capita).

Fig. 8: Development of municipal debt 1992 – 2019



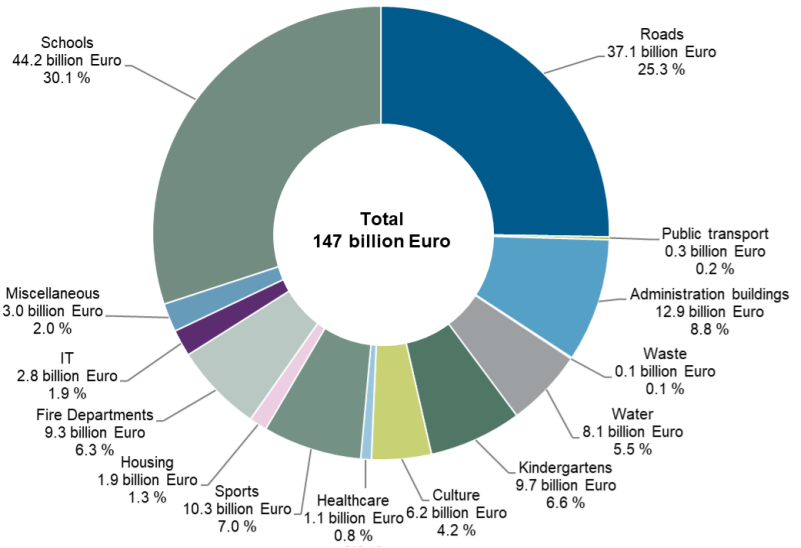
With the economic lockdown during the global Corona pandemic, the forecasts for public budgets in the Federal Republic have changed dramatically. In view of collapsing tax revenues and budget deficits, continuation of the consolidation path of previous years will no longer be possible. With falling revenues and rising expenditures, it can be assumed that municipal debt will increase significantly again for the time being. An April 2020 survey by the German Institute of Urban Affairs (Difu), found that most municipal treasuries anticipated sharply falling revenues for the current year – especially in the area of tax revenues and revenues from economic activity. At the same time, material and social expenditures will likely increase, with about two thirds each assuming strongly increasing expenditures (Brand et al. 2020 with further references).

The enormous budgetary burdens resulting from the Corona pandemic have additional negative consequences. Since the municipalities make about 60% of all public investments in the Federal Republic with the expansion and reconstruction of various public services and infrastructure (roads, bridges, schools, administrative buildings as well as water and energy supply, etc.), the massive losses of tax revenue are correspondingly significant – even if the medium- and long-term consequences of the Corona pandemic are not yet fully understood. A reduction in investments would mean an end to the painstakingly achieved successes to date. This is because the continuous increase in municipal investments, already visible in recent years, were slated to continue in 2020. According to a survey by Difu, the cities, municipalities (with at least 2,000 inhabitants) and counties had planned investments of around 35.9 billion euros for the 2019 financial year.

With their infrastructure investments, municipalities make an important contribution to transforming cities on the road to achieving the sustainability goals of the New Urban Agenda and the 2030 Agenda. Nevertheless, even before the outbreak of the Corona pandemic, considerable investment arrears existed at the municipal level that

were often clearly perceptible to citizens in the form of dilapidated schools, cultural and sports facilities, administrative buildings, and poorly maintained roads, bridges and transport systems. In 2019, the perceived investment backlog of all municipalities with a population of 2,000 or more – according to a projection by the German Institute of Urban Affairs – totalled around 147 billion euros (cf. Figure 9). This is 6% higher than in the previous year. The long-term trend of the past six years shows that the perceived investment backlog rose on average just as strongly as the construction price indices. Hence, although the municipalities invested more in gross terms, price increases meant expenditure was no longer matched in the form of replacement or improvement of infrastructure as would have been the case a few years ago. Moreover, as urbanisation increases, so too does the quantitative and qualitative demand on municipal infrastructure, so that the investment backlog has risen steadily in recent years.

Fig. 9: Municipal investment arrears in 2019



Source: KfW-Kommunalpanel 2020, conducted by Difu from September to October 2019

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Against this background, the fiscal and budgetary challenges of the municipalities are caught in a "magic triangle" between consolidation efforts on the one hand and rising consumption expenditure requirements and a reduction of growing investment arrears on the other. Again, the Corona pandemic has significantly intensified this conflict of goals, as municipalities must weigh the extent investment activities and budget consolidation can or should be postponed in the face of rising social expenditures for increasing numbers of unemployed and short-term employees. This is because expenditure for compulsory social tasks as well as high consolidation pressure leads (by necessity) to a renunciation of investments, as this is one of the few freely disposable areas of expenditure in municipal budgets. Many municipalities are also obliged to first reduce their deficits, typically accumulated over years, before new liabilities can be entertained. In such a situation, the only recourse remains to cash or liquidity

protection loans, which, according to the municipal budget ordinances of the Länder, may actually only be used to finance current administrative expenditure and not investments.

2.3.4 Regional economic disparities as a determinant of urban development

A central reason for the divergences between regions and municipalities in the Federal Republic can be located in regional or local economic power and structures, resulting from decades, if not centuries, of interdependent economic historical and geographic paths. In the 20th century, two processes in particular were of central importance for regional economic development in Germany: 1) not unlike many other industrialised countries, heavy industry and agriculture declined; 2) German reunification in 1990 resulted in former GDR (East German) corporate structures being re-directed towards a market economy, and numerous companies lacking profitability and unable to compete (internationally) entering liquidation, all of which resulted in considerable social consequences for the former East German states of Brandenburg, Mecklenburg-Western Pomerania, Saxony, Saxony-Anhalt and Thuringia).

Locally anchored economies play an important role in sustainable urban development in general and in particular in the quality of life and work in cities. This is because (profit-oriented) companies with a socio-spatial anchoring (Henn, Behling 2020: 20) not only provide employment, but also ensure the local supply of people. Disparities often exist in the economic structure and performance of individual neighbourhoods, so local economies fulfil an important stabilisation and integration function, especially in those neighbourhoods with structural and social challenges. Moreover, the economic, socio-spatial, ecological and employment impacts of such economies reveal considerable differences in their range from for example established businesses service providers, craft enterprises, (ethnic) micro or sole entrepreneurs, to new forms of urban production, such as maker spaces, open creative labs and incubators. These types of commercial structures often go hand in hand with areas that have experienced structural change, have high numbers of unemployment and residents on social welfare, as well as high vacancy rates and diminished public infrastructure.

Even though local economies are always embedded in regional, supra-regional and sometimes even global economic cycles (Birkhölzer 2000), the corporate structure of disadvantaged neighbourhoods, which was typically characterized by subsistence economics, is usually much less integrated into such supra-regional networks and value chains than manufacturing companies, since they are often small and micro businesses. Globalization has resulted in the loss of significance of many businesses, forms of trade, professions and even infrastructure in individual neighbourhoods. Such structural changes also affect the demographic composition of individual districts, specifically with regard to out-migration, ageing and high numbers of people with a migration background. These changes can then influence neighbourhood image and structure in the medium and long-term. (Bogedain, Golestani, Hamm 2020: 43). Such transformation requires coordinated action. A deeply rooted negative image can paralyse individual initiatives, and weaken potential business and civic commitment ("futility trap"), so that ultimately even political action with its typical paucity of financial support is limited. Structural weaknesses in the economy often lead to vacant property and a deterioration of public infrastructure – two developments that in turn can have repercussions, such as impairing public health and safety, increasing environmental pollution and engendering forms of political radicalisation or disillusionment.

Conversely, neighbourhoods that become increasingly attractive due to urban improvements, can reach a tipping point through increased immigration and thereby experience an ambivalent development. Improved standard of living can be seen as gentrification. Rising rents and increased demand for products and services may jeopardise the profitability of existing businesses models that cease to be viable, and new approaches must be adopted. Irrespective of these issues, local businesses face growing competition from online retail, which while opening opportunities for broader customer reach nevertheless have negative effects in the form of increased costs and competitive pressures which outweigh the positive effects for the very specific business model typical of disadvantaged neighbourhoods.

In addition to existing regional economic disparities, which place demands on structurally weak municipalities and their economic development agencies, many cities and municipalities face problems related to urban transformation needs, and new economic developments, that can vary from one neighbourhood to the next. New regional economic challenges include the digitalisation of cities which affect the movement of goods, capital and services as well as individual mobility and the provision of (public) services. Challenges also surface in emergent forms of (urban) production and co-production (smart manufacturing, additive manufacturing methods, etc.), due to increased networks across the creative industries, information and communication technology (ICT) and production in the sense of cross-innovation (network industry), and in some cases also use new forms of production in the course of expanding technologies based on artificial intelligence (AI) and robotics. The resulting conflicts between reindustrialisation and tertiarisation can be accompanied by growing wage differentials and social tensions in the city – especially in times of an increase in demand for skilled workers in the context of demographic change and lack of available capacity in various sectors.

The reindustrialisation or urban production that accompanies urbanization creates intensified competition for land just as redensification requirements force an increase in urban mixed-use areas. Concurrently, local companies face competing concerns in arguing for the "city as a business location" – especially if sustainable urban development demands increase such as decarbonisation and climate adaptation. However, some of these challenges hold the potential for sustainable economic development in municipalities and regions through an improved circular economy.

2.3.5 Urban development funding as an instrument of transformative sustainability practices

Urban development funding is one of the central instruments for sustainable urban development in Germany. Since the beginning of the 1970s, the federal and state governments have provided financial assistance under Article 104b of the Basic Law for investments in the renewal and development of cities and municipalities. This is intended to strengthen the municipalities as economic and living locations. In addition to Article 104b of the Basic Law, the legal framework for the implementation of urban development promotion is provided by Chapter 2 (Paragraphs 136 to 191) of the Federal Building Code (BauGB) and the currently valid Administrative Agreement on Urban Development Promotion 2020 (VV Städtebauförderung 2020 in conjunction with the Basic Agreement of 19 August 1986). The federal government is thus involved in urban development policy in a field in which it actually has no original competences (Zimmermann 2016). The various federal government funding programmes established for the benefit of the Länder and municipalities are characterised by a natural tension. On the one hand, according with international obligations the programmes are intended to provide financial incentives for the realisation of innovative redevelopment, utilisation and integration concepts in (disadvantaged) neighbourhoods and cities (Krautzberger 2013), which are hoped to have positive spill-over effects and social, economic and labour market policy consequences for the entire city (Schneider, Holbach-Grömig, Scheller 2018; Zimmermann 2016: 328). On the other hand, mixed financing forms of this kind always represent a "disruptive impulse" to the principles of municipal self-administration (Article 28 (2) GG) and connectivity (Article 104a GG) provided for in the Basic Law (Scheller 2005 with further references). Against the backdrop of increasing requirements with regard to climate change, digitalisation and demographic change, etc., the ability of existing small-scale programmes to meet these new challenges is being questioned at all (Riechel, Trapp, Scheller 2019). Since its establishment in 1971, federal and state urban development funding focused until the 1990s almost exclusively on municipal rehabilitation and development measures. Subsequently, the programme structure diverged to reflect the many new requirements. For example, the administrative agreement on urban development funding provided for the following individual programmes until the end of 2019 (VV Städtebauförderung 2019). These were then

merged into a new structure in 2020, in which the funding priorities were largely retained and only selectively supplemented as follows:

- Urban Redevelopment programme: aimed at restoring sustainable urban structures in areas with considerable loss of function, especially due to derelict land and vacant buildings.
- Socially Integrative City programme: aimed to promote vibrant neighbourhoods and strengthen social cohesion, in addition to investment measures, integration and employment projects were funded. In addition, forms of neighbourhood management were eligible for funding.
- Active Town and District Centres programme: in response to building use losses and building vacancies in central supply areas, construction measures strengthened the diversity of uses and included citizen participation and involvement. As in the Socially Integrative City programme, it was possible to set up so-called disposal funds to stimulate cooperation between private and municipal actors in cities and neighbourhoods.
- Urban Monument Protection Programme: reached beyond individual building preservation to include historic ensembles and squares including entire streets, historic city centres and city quarters.
- Smaller towns and municipalities – supra-local cooperation and networks Programme: strengthened smaller towns and municipalities as anchor points for general services in rural areas in order to secure their central supply functions for the entire region.
- Future Urban Green programme: Since 2017, this has funded measures to improve the urban green infrastructure, such as the creation, renovation, qualification and networking of publicly accessible green and open spaces as part of the structural maintenance and development of neighbourhoods.

These urban development programmes have always been understood as pilot programmes, to be continuously modified and supplemented. The contents of urban development programmes are under constant discussion to evaluate their ability to forge connections and possibly integrate various international and national strands of the expanded urban development discourse (representative: Heyen, Libbe, Trapp 2018). This also applies with regard to environmental policy issues or the global and local consequences of climate change, demographic change, economic globalisation or digitalisation. Although climate protection and climate adaptation issues were integrated into urban development programmes several years ago, measures have only played a minor role in the corresponding projects of the municipalities (BBSR 2016). This is because the integrated urban development concepts (INSEK) that have now been developed in many municipalities do not yet make sufficient reference to the separately developed climate protection and climate adaptation concepts, as well as to the corresponding energy-related neighbourhood concepts (BBSR 2017: 269).

Previous urban development funding focused on upgrading problem urban neighbourhoods through physical measures often only satisfied individual aspects of the target system necessary for processes of social transformation, as described for example in the New Urban Agenda, the 2030 Agenda or by the German Advisory Council on Global Change (WBGU). Reactive urban development funding programmes have so far obstructed a proactive shaping of the transformation processes addressed primarily by environmental policy. That is, the practices of past urban development funding programmes tended to remedy or cushion the undesirable effects of various influencing factors of urban development that can only be controlled to a limited extent politically, such as vacancy, structural decay, neglect, underused infrastructures, run-down real estate, gaps in supply, etc. In this way, it was mainly the symptoms of transformation that were addressed. This primarily addresses symptoms of change processes (demographic change and economic structural change). Thus far, the programmes have rarely proactively shaped urban transformation processes. Conceptually, this previous orientation of urban development funding was based on the logic of returning to a supposedly stable status quo, and averting the negative consequences of population loss or economic structural change.

Unlike environmental policy programmes, such as the National Climate Initiative or the Action Programme Climate Protection 2020, urban redevelopment programmes have so far barely addressed issues of urban transportation, energy and resource flows (SDGs 6, 7, 13), and technical infrastructure has also been neglected. It is true

that these issues are covered in various other funding programmes, but corresponding measures were often discussed under the heading of "adaptation". In this context, the adaptation of infrastructures often refers to a catch-up deconstruction underground, when the large-scale demolition of residential buildings on the edge of settlements is pending. A traditional image of catch-up infrastructure planning came into play here (Matern 2017). Existing environmental goals are rarely (explicitly) used as a frame of reference in the context of urban development funding: Quantified environmental goals, such as the German government's climate protection targets for CO_2 reduction by 80 to 95% by 2050, the land saving target with a new consumption of less than 30ha/day until 2030 or the SDG indicators for municipalities (Bertelsmann Stiftung et al. 2018), have so far been little used in urban development funding programmes as a specific frame of reference for the implementation of corresponding measures and projects.

In 2020, urban development funding in the Federal Republic of Germany was radically reoriented, to merge the former six funding programmes into three programmes. Where sustainability and environmental concerns had formerly played a subordinate role in the urban development funding programmes, they have now been significantly strengthened. The new urban development funding 2020, includes a comprehensive catalogue of funding measures (Art. 4 VV), with a detailed list of possible measures for climate protection and climate adaptation. These measures range from energy-efficient building renovation, soil unsealing, climate-friendly mobility and building materials to increasing biodiversity. In future, even within the framework of overall urban measures, at least one measure in the funding period must always serve to implement this funding criterion (Art. 3 VV). However, "measures for the use of digital technologies (urban networking of infrastructures, data, networks)" will also be eligible for funding, as will forms of neighbourhood management and inter-municipal issues as well as urban-rural cooperation. The catalogue further includes the possibility of initiating "measures with a highly innovative and experimental character in extraordinary urban development formats". In this context, the administrative agreement calls for the participation of citizens, including children and young people, as well as "hard-to-reach population groups" on several occasions. Thus, future urban development funding will aim at a "viable, sustainable and modern development of cities and municipalities" through "sustainable inner development", "reduction of land consumption" and "needs-based and future-oriented infrastructure". Here, the aim is to "enable participation and exchange in social life for all and thus strengthen social cohesion" underscored by the concept of urban transformation oriented towards sustainability goals.

The programmes and measures of urban development promoted by the federal government and the Länder regularly undergo evaluation, as provided for in Article 104b (3) of the Basic Law, according to which the Bundestag, the Federal Government and the Bundesrat "shall be informed upon request about the implementation of the measures and the improvements achieved". The aim of the evaluations is to gain information on the further improvement of the urban development funding programmes and their implementation on the ground. The urban development funding programmes are designed as pilot programmes. Since 2010, an evaluation concept has been adopted jointly by the federal government and the Länder, an important component of which is monitoring for the urban development funding programme areas. Indicator-based monitoring records input and output data as well as contextual information on municipal development. In this way, information is collected on the concrete use and target achievement of the urban development funds provided by the federal and state governments, and changes in the individual urban development areas and neighbourhoods are documented. The Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR) evaluates the data for the previous implementation year.

2.3.6 Interim conclusion

In the Federal Republic of Germany, the base conditions for urban development in general and a transformation of cities towards sustainability goals, as envisaged by the New Urban Agenda and the 2030 Agenda, are heterogeneous. This is because the settlement structure, topography and demographics as well as the social, economic

and fiscal framework conditions of the more than 11,000 municipalities in Germany diverge considerably in an interregional comparison. In addition, due to the federal structure of the Federal Republic of Germany, urban development policy is shaped in part by shared and in part by autonomous responsibilities of the individual federal levels. Such a structure increases the need for political and administrative coordination in a representational policy field such as urban development policy, which interfaces with several other policy fields such as structural, sustainability, environmental, building, transport, social and labour market policy. In recent years, important steps have been taken in Germany to realign urban development policy – in the spirit of the New Urban Agenda – towards transformative urban redevelopment. Municipalities are increasingly obliged to conceptually embed their planned urban development measures in corresponding sustainability strategies. Even if the various subconcepts (sustainability, climate, energy refurbishment concept, etc.) of many municipalities continue to be unified, the reorientation of institutional urban development funding by the federal and state governments in 2020 was an important step towards promoting holistic sustainability approaches. In future, it would be desirable if urban development funding and other funding programmes that the federal and state governments regularly launch for the benefit of municipalities could be more strongly linked and with greater ties to the goals of the New Urban Agenda and the 2030 Agenda, so that awareness at the municipal level might be raised.

3. New Urban Agenda in implementation: progress of a cross-level sustainability policy

The following sections document the progress that the Federal Republic – and here in particular the municipalities – have made in recent years with regard to the implementation of the New Urban Agenda specifically in the areas of climate protection and climate adaptation (3.1) and mobility (3.2). The methodological section discussed the necessity of limiting analysis to these two thematic areas. Where possible, this chapter covers the national, subnational and municipal levels in the indicator-based presentations. Best practice examples from the partner municipalities conclude the chapter.

3.1 Climate protection and climate adaptation

The New Urban Agenda refers directly to the agreements of the Paris Climate Change Agreement (Paragraphs 6, 79) and explicitly addresses the issues of climate change mitigation and adaptation in more than a dozen paragraphs. The importance of climate protection and adaptation measures is often addressed in connection with the resilience of infrastructures, transport and energy services as well as the economy by calling for a strengthening of resilience in the event of (climate-related) disasters.

The topic also has great significance in municipal practice, where climate protection is often equated with sustainable urban development. Of the many measures for municipal climate protection that have received special media attention in the past two years, the "climate emergency" declared by various German municipalities underscores the degree of influence public pressure has on the climate policies of cities and municipalities. In 2019, not least as a response to the Fridays for Future protests, Konstanz was the first city to make a resolution recognising the insufficiency of previous climate protection measures and the need for additional measures. Since then, more than 70 municipalities in Germany have adopted the so-called "climate emergency" or launched actions to mitigate climate change. The momentum of resolutions has slowed in the wake of the Corona pandemic, but the number of active municipalities continues to grow. Research on climate emergencies declared so far suggests that many resolutions tend to be somewhat general and lack the backing of concrete actions and resources. At the same time, however, solid building blocks, such as the initiation of climate protection concepts or the systematic review of all municipal measures for their climate impact, do exist, which go far beyond a mere symbolic policy (Hirschl & Pfeifer 2020, Climate Alliance 2019).

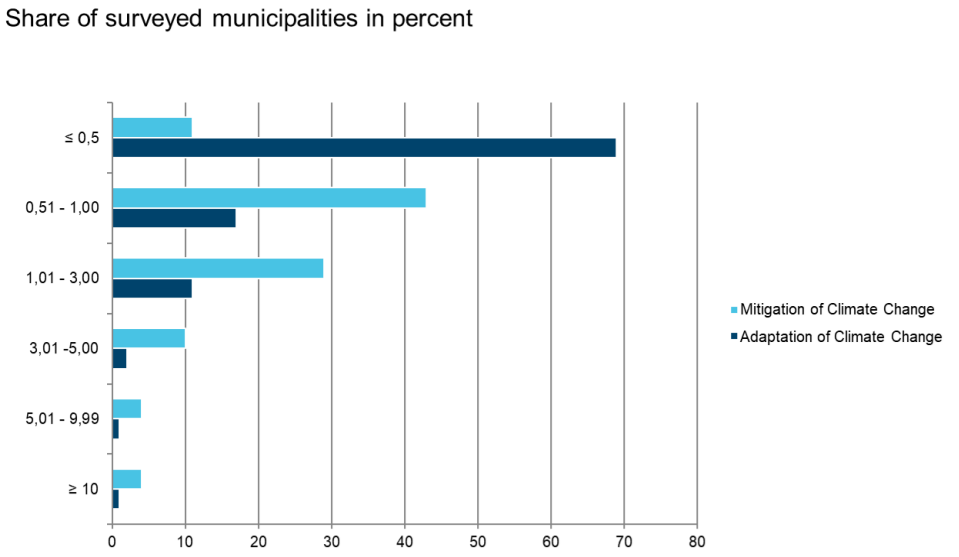
Examples of municipality commitment are evident in the annual "Climate Active Municipality" competition organised by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and the German Institute of Urban Affairs. Since 2009, more than 100 municipalities and regions across Germany have received awards for exemplary projects on climate protection and climate impact management. Awards are made in the categories "Resource and Energy Efficiency", "Climate Adaptation" and "Climate Activities for Participation". The award-winning projects of the municipalities are characterised by a very high diversity and are considered best practice examples for other municipalities that would like to address the topic from the perspective of their individual structures.

3.1.1 Institutional framework

Successful climate protection and climate adaptation management by counties, cities and municipalities requires institutional framework conditions that are created at the higher levels of the federal and state governments and also within the municipalities themselves. The New Urban Agenda takes this into account, especially with Paragraph 79, which states: "We commit ourselves to promoting international, national, subnational and local climate

action, including climate change adaptation and mitigation, and to supporting the efforts of cities and human settlements, their inhabitants and all local stakeholders as important implementers […]".

Fig. 10: Personnel for climate protection and adaptation in full-time equivalents in 2020



Question 1 (n = 171): Does your municipality employ special personnel who focus primarily on climate protection issues? – If so, how many full-time equivalent positions?
(1 full-time equivalent position = 100 % working time)

Question 2 (n = 150): How many full-time equivalent positions are available for climate adaptation?
(1 full-time equivalent position = 100 % working time)

Source: Difu-Kommunalbefragung (municipal survey) 2020

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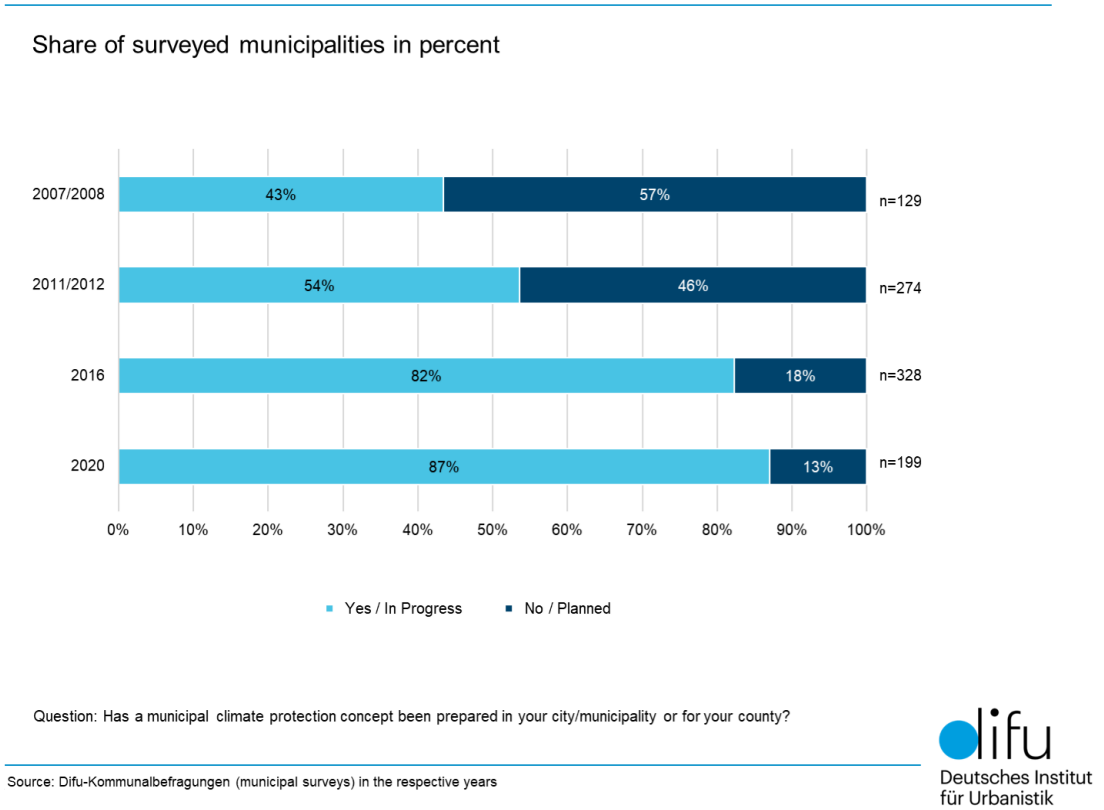
Despite financial and personnel constraints, which many municipalities regularly report in different contexts (see Figure 10), the topic of "climate change" is high on the political agenda of many municipalities. Almost all partner municipalities have prepared and adopted climate protection concepts. A survey of municipalities by Difu draws a similar conclusion, in which increasing numbers of municipalities state that they have prepared or are currently preparing a climate protection concept (see Figure 11).

Fig. 11: Preparation of municipal climate protection concepts over time



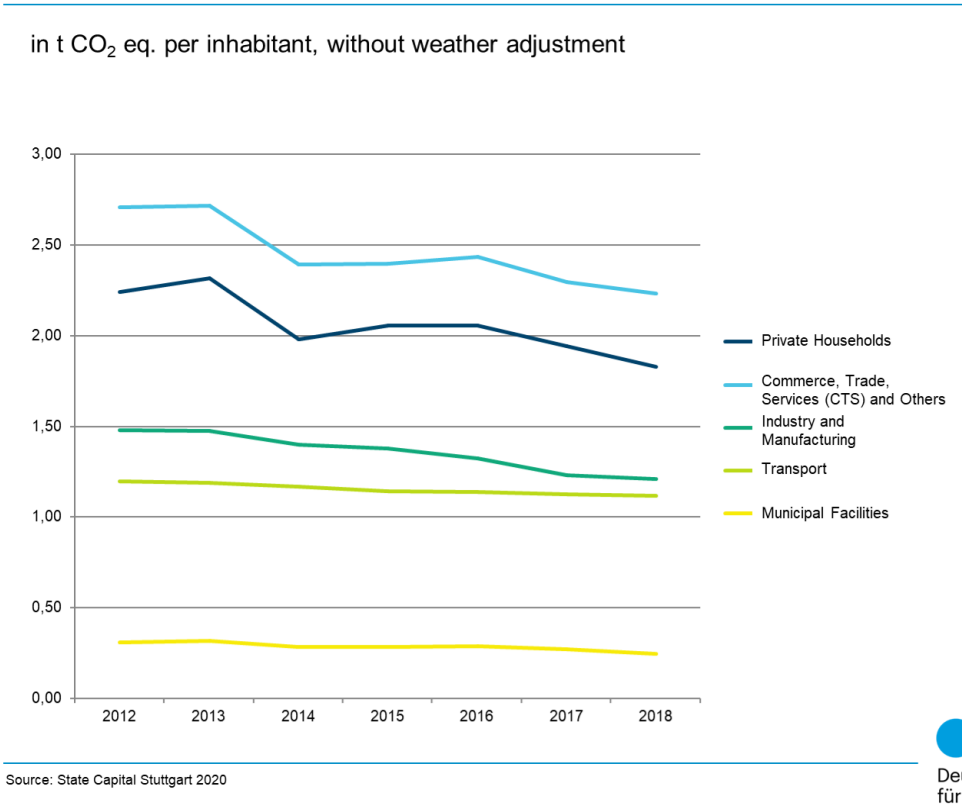
The **state capital Stuttgart** is very well positioned in the area of climate protection, which is due to long-standing activities – Stuttgart has been a member of the Climate Alliance of European Cities since 1995, for example. Various projects and measures attest to the use and expansion of renewable energies as well as in climate-friendly procurement; there are funding programmes, networking systems, educational projects and measures for improved internal management. A clear distinction is made between the strategic, integrative work in staff units and the operational work in various sectoral offices. There are also diverse activities in climate adaptation. For example, the Stuttgart climate change adaptation concept KLIMAKS, which was already adopted by the city council in 2012, includes more than 50 measures in all areas of adaptation and has a special focus on the urban climatic-air-hygienic situation in the city area. In 2019, the action programme "World climate in need – Stuttgart acts" was also developed, in which a climate protection fund was formed from 2018 budget surpluses and thus around 200 million euros could be additionally invested in climate protection and adaptation projects. Furthermore, the state capital has been regularly balancing its GHG emissions since 1990 – most recently even annually.

3.1.2 Sector-specific greenhouse gas emissions

Paragraph 79 of the New Urban Agenda addresses the sector-specific reduction of various GHG emissions in order to “be consistent with the goals of the Paris Agreement adopted under the United Nations Framework Convention on Climate Change, including holding the increase in the global average temperature to well below 2 degrees Celsius above preindustrial levels and pursuing efforts to limit the temperature increase to 1.5 degrees Celsius above pre-industrial levels".

The basis for municipal climate management is usually the balancing of local GHG emissions. According to the Difu Municipal Survey 2020, the majority of German municipalities have already drawn up at least one CO_2 balance sheet. Regular analysis of municipal emissions, i.e. monitoring, on the other hand, is rarely performed, and is predominantly left to larger cities, if at all.

Fig. 12: Development of sectoral GHG emissions of the state capital Stuttgart 2012 – 2018



Source: State Capital Stuttgart 2020

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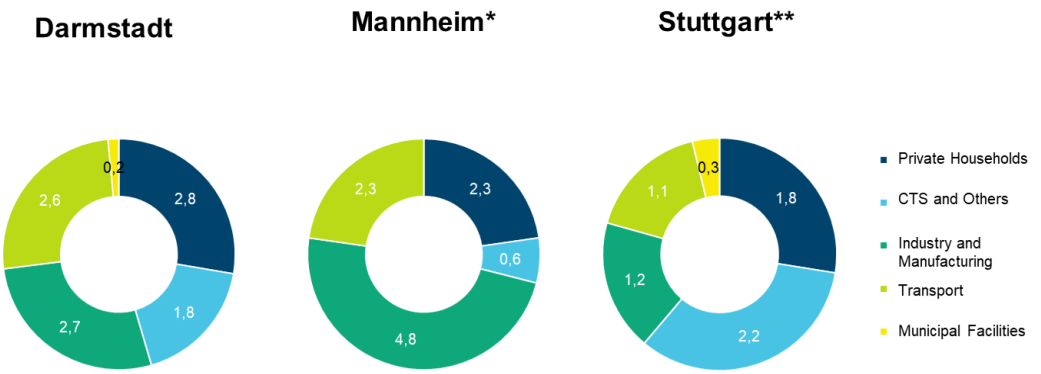
The development of sectoral GHG emissions in a municipality, as exemplified by Stuttgart in Figure 12, also reflects the development at the national level. The greatest savings can be observed in industry and commerce, which can be explained by the tertiarisation of the economic structure and increased energy efficiency, among other things. Similarly, emission reductions can also be observed in the private household sector, interacting with an increased number of inhabitants. These have their origin, among other things, in the energy refurbishment of existing buildings and the completion of residential buildings with renewable energy heating (cf. Figure 16). In addition, the increased share of renewable energies plays a major role in almost all sectors: the electricity GHG factor has improved by around 30% in the period shown. In conjunction with the positive development of GHG emissions at municipal facilities, the commitment of the counties, cities and municipalities to climate protection becomes visible here. All participating partner municipalities report that they provide offers to sensitise and inform citizens on the topic of climate protection and renewable energies and use renewable energies on municipal properties. In contrast, few changes have occurred over time in the transport sector. Distribution across different means of transport, remaining for example relatively constant in passenger transit for years (cf. 3.2.1 Modal split). Freight transport is actually gradually shifting away from more environmentally friendly modes of transport to road transport. In addition, technical efficiency gains in both areas are being eroded by larger and more powerful vehicles and longer driving distances.

Fig. 13: Sectoral greenhouse gas emissions of selected municipalities in 2018

in t CO2 eq. per inhabitant, weather-adjusted



* excluding municipal facilities
** without weather adjustment

Source: Darmstadt 2020, Mannheim 2020, State Capital Stuttgart 2020

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The share of transport-related GHG emissions can vary considerably between municipalities (see Figure 13). In addition to the control options of a municipality, city-specific characteristics such as settlement, population and economic structure play a major role with regard to sectoral GHG emissions. In Mannheim, the formative metal processing and chemical industries are recognisable in the GHG balance, while Stuttgart's strong service sector and the corresponding building stock dominate its own analysis.

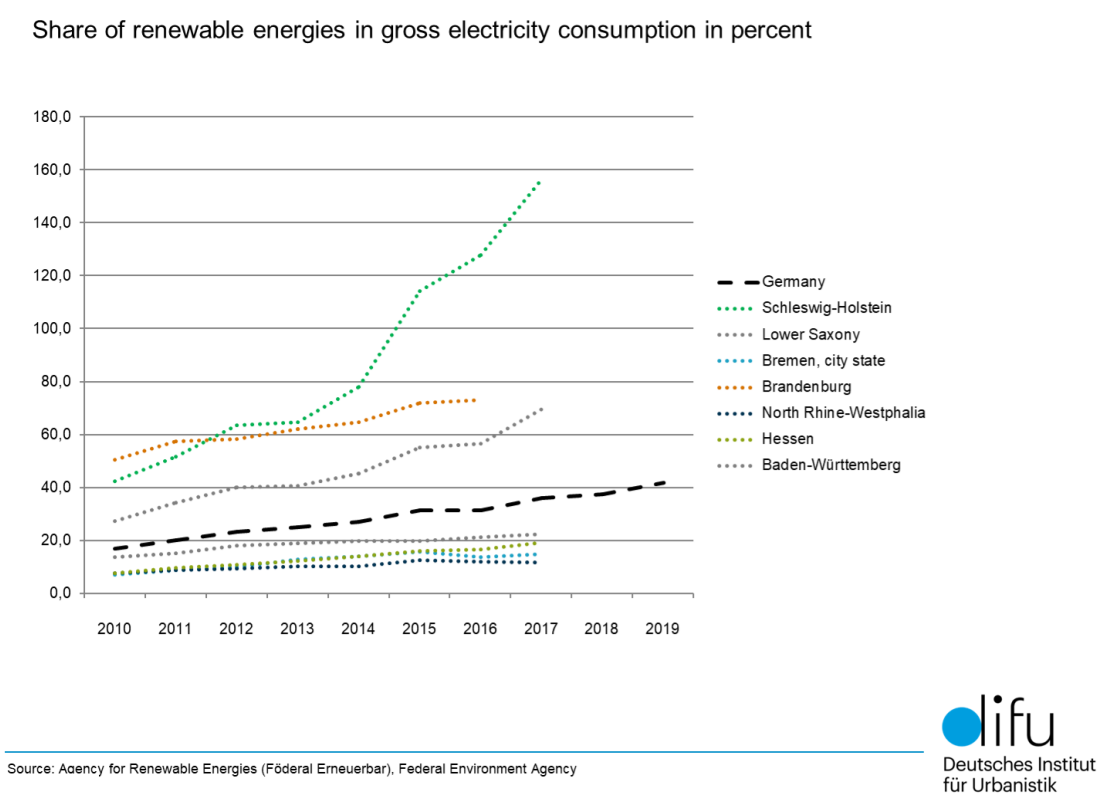
Climate protection activities as part of environmental and nature protection have a very high priority on **Juist.** As early as 2010, the local council decided that the North Sea island should be climate-neutral by 2030 and CO_2 emissions must thus be reduced to zero. This is to include offsetting only after all possibilities have been exhausted. With this declaration of intent, the island municipality of Juist supports the Sylt Declaration of the environment ministers of the Netherlands, Germany and Denmark, which declares that the area of the Wadden Sea World Heritage Site is to become climate neutral by 2030. In order to achieve this ambitious goal, the climate protection project "Climate Island Juist" was developed as a joint project with the energy supplier EWE AG. With the climate protection goal and the climate protection project "Klimainsel Juist", Juist already successfully participated in the "Klima kommunal" competition in 2010. Since 2016, the overall destination Juist has also been certified as a Sustainable Destination by TourCert. The municipal properties of Juist take a pioneering approach through offsetting, as they are powered by 100% green electricity and offset certificates for emissions from the energy sources natural gas for heating. Juist also has a policy for sustainable purchasing, including green electricity, goGreen, organic products, fair trade, green IT, climate-neutral printing of brochures, etc. According to the greenhouse gas balances commissioned by the municipality, for example, almost 20,000 t CO_2 eq. were produced on the island in 2014. With measures such as the expansion of LED technology in street lighting, which has been prevalent for a long time, an e-load bicycle, further personnel in climate protection and the recently launched climate workshops with school pupils, the emissions are to be continuously reduced.

3.1.3 Renewable energies

With Paragraph 54, the New Urban Agenda calls for the "generation and use of renewable and affordable energy" and subsequently refers to "reductions in renewable energy costs give cities and human settlements an effective tool to lower energy supply costs ". Promoting energy efficiency and sustainable renewable energy and ensuring "universal access to affordable, reliable and modern energy services" are also explicitly called for in Paragraph 121.

In addition to biomass, photovoltaics and hydropower, the renewable energy landscape in Germany is primarily characterised by wind power. This results in a north-south divide in the share of renewable energies in gross electricity consumption in a nationwide comparison (cf. Figure 14). While the coastal north of Germany, which is favoured by wind, produces far more renewable electricity than it consumes, the effect is reversed in the south of the country, where it is intensified due to prevailing industrial structures.

Fig. 14: Development of renewable energies in the federal states of the partner municipalities 2010–2019



Source: Agency for Renewable Energies (Föderal Erneuerbar), Federal Environment Agency

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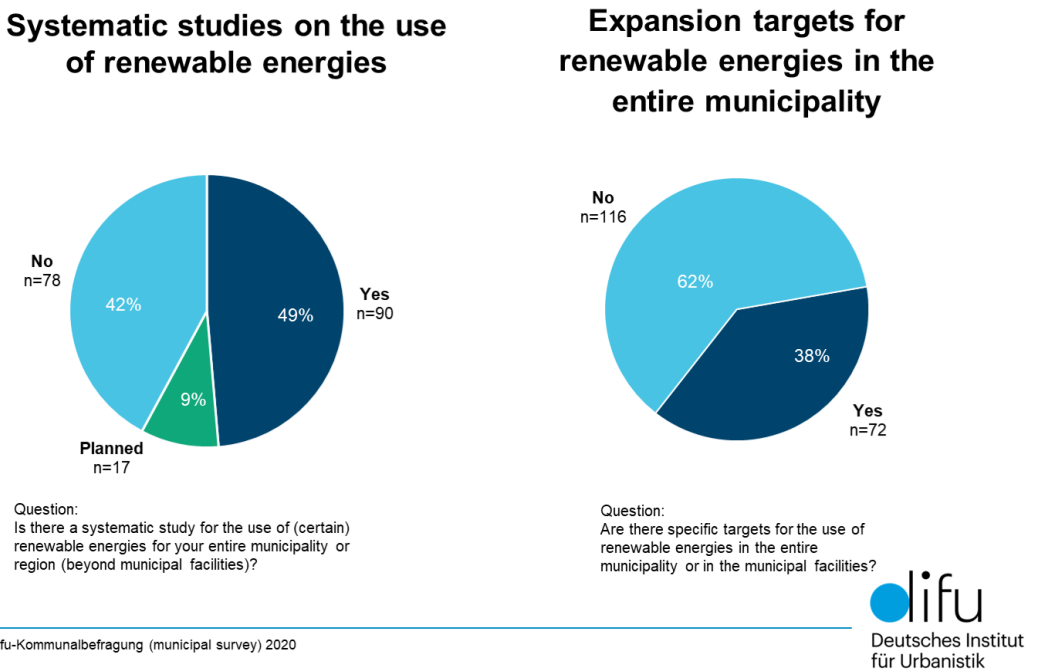
At the municipal level, only isolated statistics exist on the expansion of renewable energies. More than half of the municipalities surveyed in 2020 responded that they have conducted or are planning to conduct a systematic study on the use of renewable energies (see Figure 15, left), including an expansion of photovoltaics and wind power in their own municipal properties. Corresponding survey results inform residents of expansion possibilities. But the majority of municipalities do not pursue concrete expansion targets (see municipal survey in Figure 15, right).

Fig. 15: Systematic studies and expansion targets for renewable energies in 2020

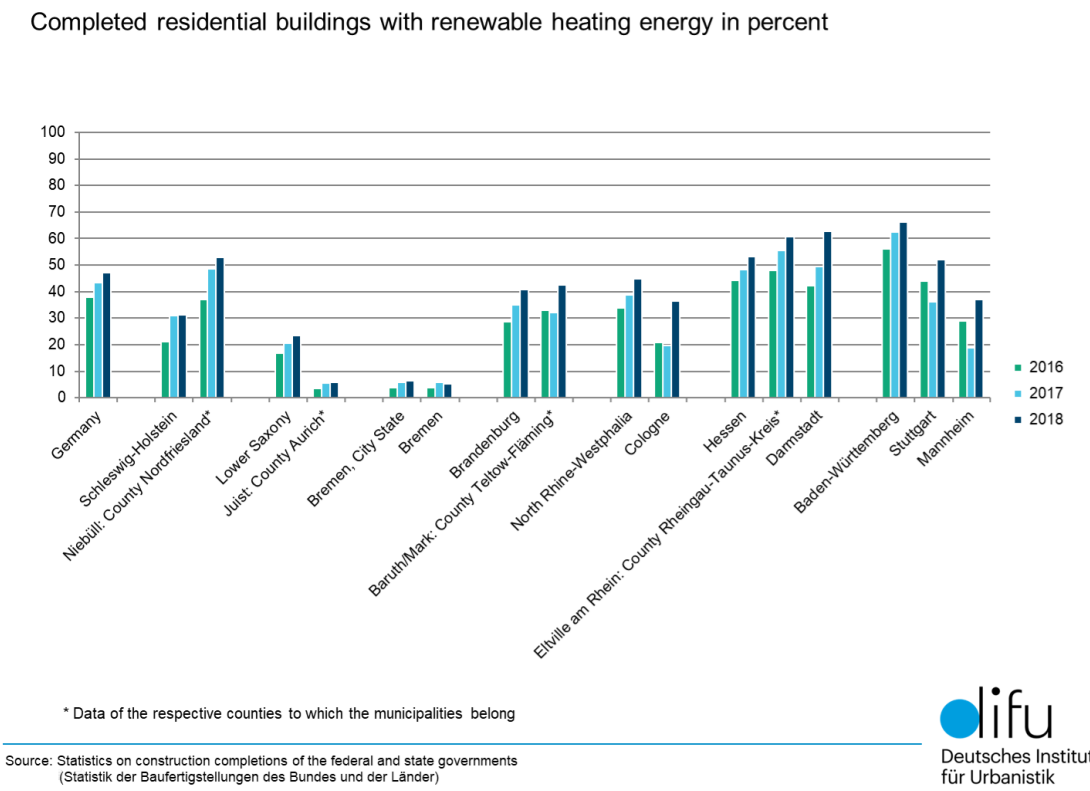
Share of surveyed municipalities in percent



Source: Difu-Kommunalbefragung (municipal survey) 2020

The provision of space heating in residential buildings is an important starting point for municipal climate protection, accounting for about two thirds of final energy-related building energy consumption in Germany. The New Urban Agenda commits at all levels “to develop sustainable, renewable and affordable energy and energy-efficient buildings and construction modes" (Paragraph 75). Solar, the use of heat pumps, district heating and biomass can contribute significantly to a reduction in fossil energy consumption and thus CO_2 emissions. Since the nationwide rates of new construction are less than 1% , the importance of new buildings results indirectly from their exemplary function for measures that can later be transferred as innovations to the existing building stock and are associated with lower investment costs due to broader market incorporation.

Fig. 16: Completed residential buildings with renewable heating energy 2016 – 2018



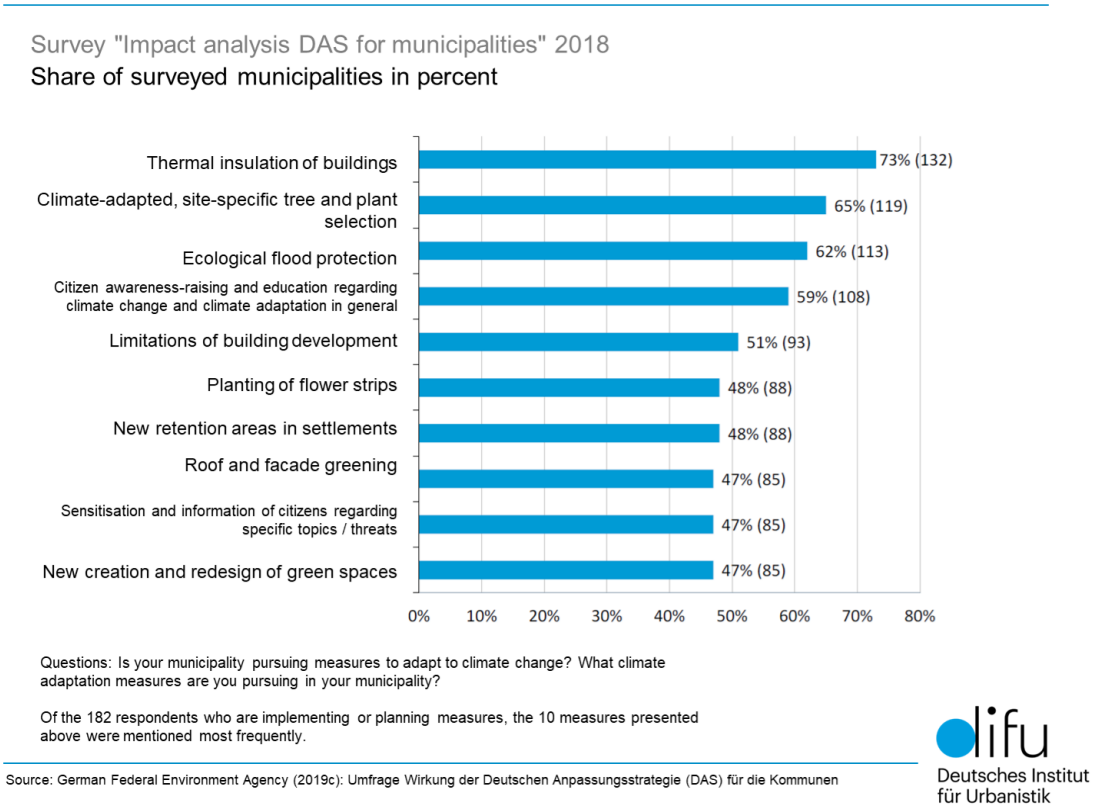
The activities of 2016 to 2018 show an increase in the share of completed residential buildings with renewable heating energy in all partner municipalities (cf. Figure 16). Here, most municipalities measure within in a range of between 30 and 60% and a slight increase in the rate, reflecting the Germany-wide trend. In contrast, rates in the county Aurich, in which the island municipality of Juist is located, and Bremen, where the rate remains in single digits, are exceptions.

3.1.4 Climate adaptation measures

Paragraphs 80 and 101 directly address adaptation to climate change: "We commit ourselves to supporting the medium- to long-term adaptation planning process, as well as city-level assessments of climate vulnerability and impact, to inform adaptation plans, policies, programmes and actions that build the resilience of urban inhabitants, including through the use of ecosystem-based adaptation." (Paragraph 80).

Measures to adapt to climate change are planned and implemented in the municipalities depending on how they are each individually affected – whether through geographical conditions, such as proximity to the coast, or urban planning conditions that favour heat islands, for example. Unlike in municipal climate protection, where responsibilities are organised more centrally, climate adaptation measures are more difficult to record or even quantify. They are often implemented in the planning or in concrete urban development measures of various departments, but are rarely absorbed under the heading of climate adaptation (cf. Bertelsmann Stiftung / Difu 2020). All participating partner municipalities report that adaptation to the consequences of climate change is taken into account in urban planning and development, and that an interdisciplinary or interdepartmental working group on climate adaptation is active in their own city.

Fig. 17: Climate adaptation measures implemented or planned in 2018



In the actual implementation of climate adaptation measures, the municipalities primarily note the ecological reconstruction of urban green spaces, energy-efficient building refurbishment, flood protection and citizen information activity (cf. Figure 17). Adaptations of the transport infrastructure, on the other hand, are not among the most frequently noted measures. Good examples of climate change adaptation measures are recognized in the biennial "Blauer KomPass" competition organized by BMU and UBA and presented in the German Environment Agency's so called Tatenbank (database of actions) (see Umweltbundesamt 2021).

In cooperation with the county Rheingau-Taunus-Kreis, **Eltville am Rhein** has participated in the preparation of a climate protection concept at county level. In the administration union of Rheingau, an initial CO_2 balance has also been drawn up, which is being continued on a city-specific basis with regard to the city's own properties and thus serves to establish "climate controlling". In the future, Eltville seeks to concentrate its climate protection efforts on the development of individual neighbourhoods, with a focus on energy efficiency and renewable energies. For the area of climate adaptation, climate forecasts were evaluated for the Rheingau and possible effects of climate change on viticulture were investigated as part of the network and research project "Klia-Net – Collaborations for Climate Adaptation in the Rheingau". Furthermore, heavy rainfall simulations were created and a comprehensive catalogue of climate adaptation measures was developed.

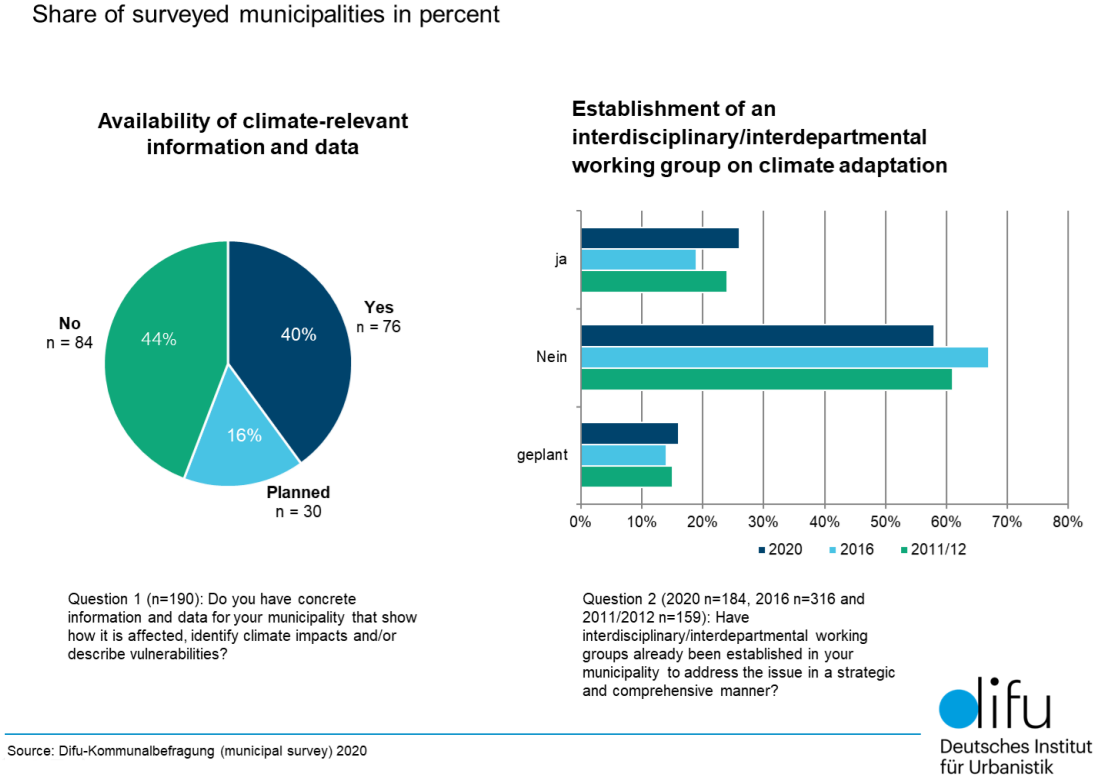
3.1.5 Climate Smart City

The concept of the "smart city" of the New Urban Agenda refers to the provision of environmentally friendly alternatives and opportunities to promote sustainable economic growth (Paragraph 66). In doing so, the opportunities

of digitalisation, clean energies and innovative technologies are to be used and made accessible to the public, especially for women and girls, children and youth, people with disabilities, older people and people in precarious living situations (Paragraph 156). The goals of a so-called "Climate Smart City" are specifically formulated in several Paragraphs (e.g. 34, 50, 66, 74, 156, 160). For example, Paragraph 34 of the New Urban Agenda provides for equitable and affordable access to sustainable basic physical and social infrastructure for all, without discrimination. Moreover, technological innovations can have a positive impact not only on digitalisation, but also on mobility and the climate: In the case of transport and public transport systems, this should “reduce congestion and pollution while improving efficiency, connectivity, accessibility, health and quality of life” (Paragraph 118).

In a nine-partner municipality cooperation, various sustainability activities were noted that indicate the current implementation status of the smart city concept in the relevant cities and municipalities. For example, two thirds of the municipalities have developed a long-term strategy for dealing with big data. However, the achievement of goals and the impact of the corresponding digital agendas or digital strategies have not yet been verified in any of the participating municipalities through long-term monitoring. This makes tracking the effectiveness of the corresponding strategies difficult. More than half of the municipalities state that digital platforms are already in use today, making information that is relevant for democratic decision-making processes more available locally. In this regard, these municipalities have an inclusive and activating approach that enables the participation of all citizens. Furthermore, these municipalities state that they and/or their municipal companies have sovereignty over their data that is relevant for the fulfilment of their tasks. Nevertheless, the digitalisation efforts of most municipalities in Germany remain in the early stages. The use of digital solutions to combat climate change in the sense of a Climate Smart City is therefore still a topic for the future.

Fig. 18: Requirements for Climate Smart Cities



According to the 2020 Difu Municipal Survey, about half of the municipalities state that they have or will have climate adaptation-relevant information and data. At the same time, the vast majority of cities report that interdepartmental cooperation on climate adaptation has not yet been established within local government. In order to be able to use the potential of digitalisation for the socio-ecological transformation at the local level, the very structures that can be considered a prerequisite for Climate Smart Cities must be further developed. Three partner municipalities have already indicated that they use digital technologies (e.g. smart grids, smart metering, smart lighting) to support the local energy transition.

Digitalisation has a high priority in the **City of Science Darmstadt.** This is evidenced not least by the BITKOM "Digital City" competition won in 2017. In a smart city ranking by the BITKOM association, Darmstadt ranks among the top 10 of over 80 municipalities. The developments are correspondingly diverse at present, ranging from a high level of coverage with sensor data both for traffic and in the areas of weather and climate, to advanced broadband expansion, to the fact that citizens are in general very open to digital solutions. Most of the projects at the interfaces between administration and the population are bundled in the "Digitalstadt Darmstadt GmbH". In addition to administration the field of action, the company is pursuing goals in a further 14 fields of action with the vision of setting up the Digital City of Darmstadt as a pioneer and international beacon of improved everyday urban life through new technologies.

3.2 Mobility in an urban-regional context

In the New Urban Agenda, the promotion of "sustainable transport infrastructures and services" or more generally "sustainable urban mobility systems" plays an important role. Although not more precisely defined in certain key paragraphs, (e.g. 34, 54, or 118), it does generally become clear that the goals are to reduce congestion and environmental pollution (Paragraph 54), to ensure safety (Paragraph 113), and to enable mobility for all people (Paragraphs 34, 54, 70, 113, 114). From these overarching goals, a focus can be derived on strengthening public transport, which is also explicitly addressed in Paragraph 114a. On the other hand, increasing efficiency and reducing emissions in motorised individual transport, for example by expanding the infrastructure for e-mobility and through "smart" ways of traffic control, is less important. Only Paragraph 118 refers to the need to develop financing instruments to improve transport and mobility systems and infrastructure with technology-based innovations. Paragraphs 113, 118 and 114a deal with the targeted promotion of active and thus also health-promoting mobility in walking and cycling, whereby the latter also explicitly demands priority over motorised private transport. Finally, Paragraphs 114c-d refers to the reduction of travel and transport needs through improved access to goods and services close to home.

The majority of German cities today suffer from significant traffic congestion. This is evidenced, for example, by the TomTom Traffic Index, which in 2019 found an average daily travel time increase of 17 to 34% due to congestion or traffic obstructions for each of the 26 major German cities analysed – with an upward trend for the majority of all cities studied (TomTom International BV 2019). However, congestion does not only affect private motorised transport and the density of road infrastructure use, but also the significant infrastructure bottlenecks in public transport, which reduce the quality of service. In addition, the settlement structure of many cities and in particular of their surrounding areas is insufficiently public transport friendly (e.g. settlement development not oriented towards public transport axes, greenfield industrial estates, etc.; see also Priebs 2019). Various obstacles often prohibit a reorientation of the "modal split" in the sense of sustainable urban and regional development. These include the high utilisation of existing capacities, the high investment requirements with sometimes very long planning and realisation phases, the narrow financial scope of action of the municipal public transport authorities, especially with regard to the financing of an attractive offer, the lack of personnel in the municipalities and the transport companies, but also the rejection of new public transport projects by the citizens. Furthermore, it is difficult for the municipalities to actually spend the significantly increased investment funds for new projects within the framework of the clean air and climate protection policy. From the user's perspective, hikes in fares at the city limits can lead to a perception that travelling by public transport is more expensive than using one's own car. The

coronavirus pandemic, with its dominant trend towards working from home, has sharpened the focus on the lack of fare options for part-time employees and employees with varying work locations. Implementation of innovative passenger transport services, such as on-demand transport, has been hindered by the Passenger Transport Act (PBefG), which, however, is to be removed by an amendment during the current legislative period (cf. Federal Government 2020).

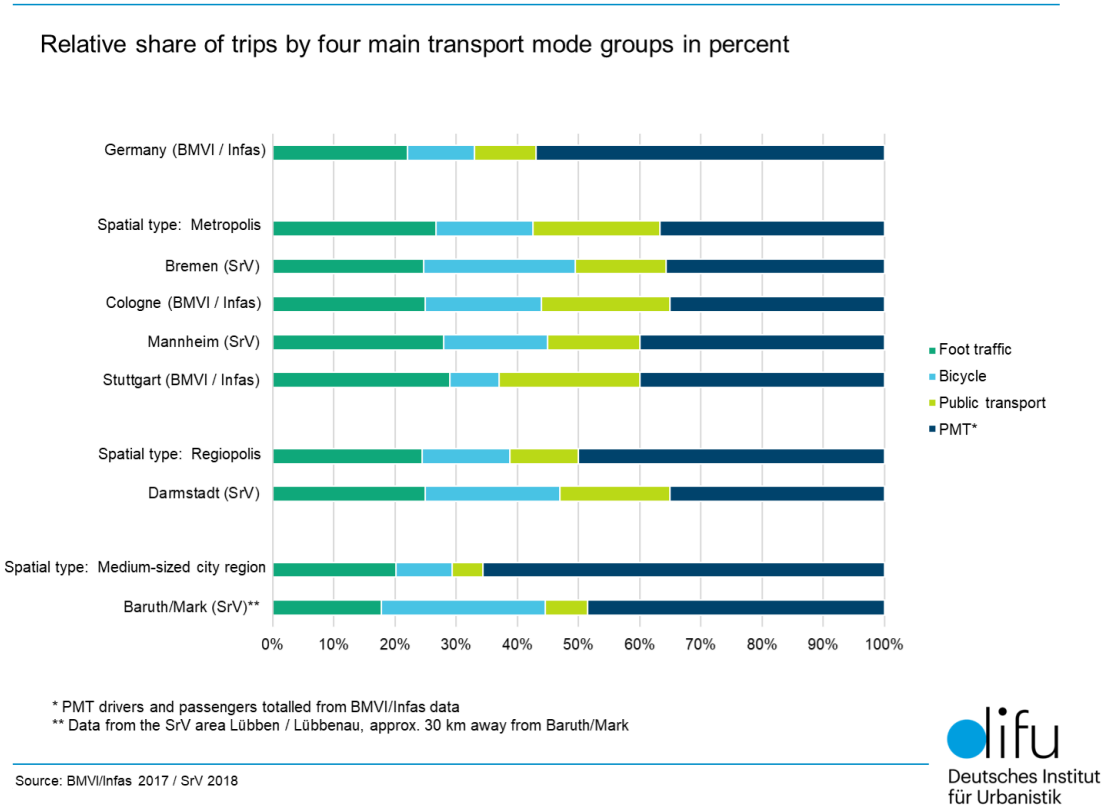
3.2.1 Modal split

The New Urban Agenda provides in Paragraph 114 for the promotion of access for all people to "safe, age- and gender-responsive, affordable, accessible and sustainable urban mobility [...] systems". This demand can – to some extent – be captured by the indicator of the so-called "modal split", i.a. from the set of SDG indicators for municipalities. The modal split describes "the distribution of transport volume and transport performance among the different transport modalities (usually walking, cycling, public transport and motorised private transport). In this way, the indicator provides a picture of mobility behaviour within the municipality. In the long term, the shares of non-motorised transport (i.e. walking and cycling) and public transport should be increased in order to ensure the sustainability of transport systems" (Peters et al. 2020). The informative value of this indicator is limited if the modal split only refers to the mode of transport used by the local resident population, because increasing commuter traffic into the city, for example, is not taken into account. Moreover, the relative modal split cannot reflect a possible absolute growth in traffic and thus the traffic load due to more frequent trips, for example.

In figure 19, the modal splits from the years 2017 and 2018 are shown for the partner municipalities Bremen, Cologne, Darmstadt, Stuttgart and Mannheim as well as comparative values for the corresponding spatial types, which represent the average of all municipalities of this type.[1] The values were obtained from two research projects of the Federal Ministry of Transport (BMVI/Infas, 2017) and the Technical University of Dresden (SrV, 2018). For the smaller partner municipality Baruth/Mark, the study area Lübben/Lübbenau was mapped as an approximate value. The data basis for both mobility analyses are regular household surveys. Overall, the municipalities studied here have a significantly above-average share of environmentally friendly modes of transport compared to the overall German value – with the lowest shares of motorised private transport (MIV) in Cologne and Darmstadt. While journeys on foot are relatively evenly distributed across all the cities studied and between the spatial types (18 to 29%), the shares of cycling differ greatly in some cases between the cities, even within the same spatial type (8 to 27%). This independence of settlement structure conditions indicates that the attractiveness of cycling depends on various factors that can be actively shaped by the municipality. With increasing rural character, public passenger transport typically decreases, while private motorised transport increases.

[1] The SrV (System of Representative Traffic Surveys) provides mobility data of the resident population of a city. Their traffic within the city area as well as beyond the city limits is considered. The nationwide survey MiD (Mobility in Germany) is important for a general overview of the traffic situation. The nationwide MiD is supplemented by additional surveys of federal states, regions and municipalities. The MiD surveys are representative for the respective survey area.

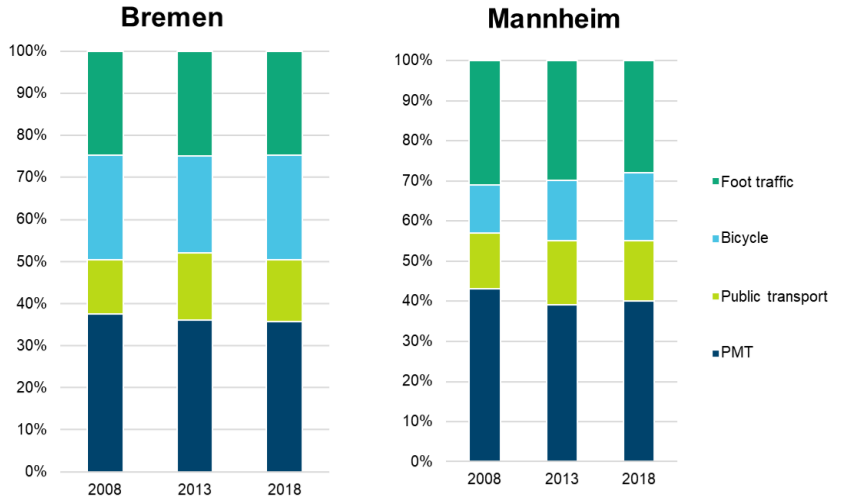
Fig. 19: Modal split in selected cities differentiated by regional statistical area types 2017 / 2018



The shares of the modes of transport have remained relatively stable over several years (see Figure 20). The private car dominates the choice of means of transport in the cities and much more so in Germany as a whole, thus leading all other modes of transport – with a slight downward trend. Within the environmental alliance, the share of walking is also declining slightly. These shares are balanced out by marginal growth in public transport and cycling. Cycling in particular has experienced an upswing, especially since the outbreak of the Corona pandemic. This can be observed not least in the establishment of many so-called pop-up cycle paths in the city centres. Together with the decreasing share in public transport, the modal split in 2020 has thus revealed a previously unknown dynamic.

Fig. 20: Development of the modal split in selected partner municipalities 2008 – 2018

Relative share of trips by four main transport mode groups in percent



Source: SrV 2008, 2013 and 2018

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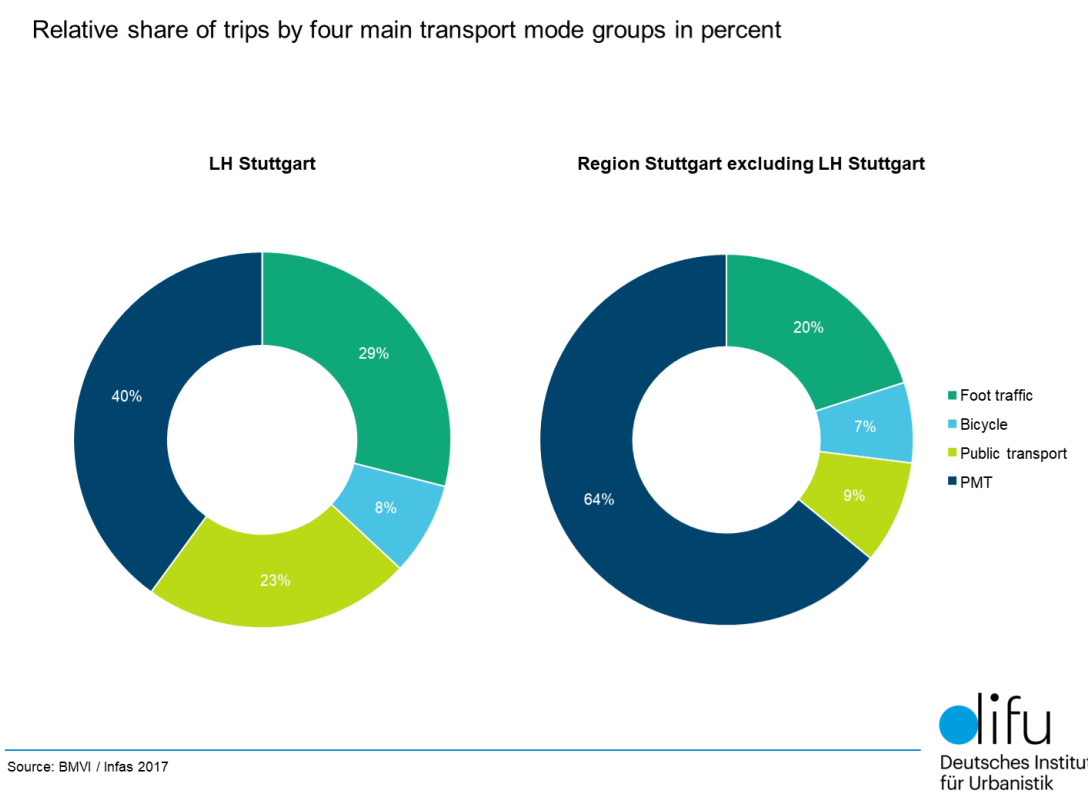
The strongly regional design options for sustainable mobility that favour the low CO_2 modes of transport are shown in Figure 21 as an example for the Stuttgart region. While the share of cycling differs little between the state capital and the Stuttgart Region, it is clear that the share of private motorised transport is significantly higher in the region and that of public transport and walking is significantly lower. The Stuttgart Region includes the five surrounding counties with a total of 178 cities and municipalities and is presented here without the data from the state capital itself. Conversely, the inner-city modal split of the state capital would presumably be significantly lower in CO_2 without the commuting in and out of the region, which would, however, be an inadequate consideration in view of the central function of the state capital, where many companies and administrative institutions are located as employers. On the other hand, it can often be observed that the urban population places a traffic burden on tourist destinations in the surrounding area. All in all, this example vividly illustrates the necessity of regional mobility planning for the sustainable development of cities and their respective surrounding areas.

Fig. 21: Modal split in the urban-rural context



By 2025, respectively 2030, **Cologne** wants to ensure and increase the quality of life in the city with a two-thirds share of environmentally friendly transport in the total traffic volume. This goal was defined in the strategy paper "Cologne mobile 2025" published in 2014. A total of 17 courses of action are planned to achieve this guiding goal. Even though rehabilitation of the existing transport infrastructure is to have priority over its expansion, simultaneous further development of the infrastructure is sought in order to guarantee the efficiency of the growing city. In particular, expansion measures for bicycle traffic and local public transport are to be implemented in order to achieve the modal split targets. In addition, the aim is to intensify regional cooperation in order to tackle transport problems across territorial borders. Local public transport is thus to be further expanded in order to achieve a higher public transport share with the (supra-)regionally important project "Bahnknoten Köln" (*Cologne rail hub*) and the expansion of the urban rail network. Cologne hopes to increasingly pursue the approach of "Smart Mobility" and offer integrated mobility services "from a single source". Car and bike sharing, electromobility and active safety systems for cars are supported and promoted by the city's own companies. Further settlement development is to be closely coordinated with transport planning.

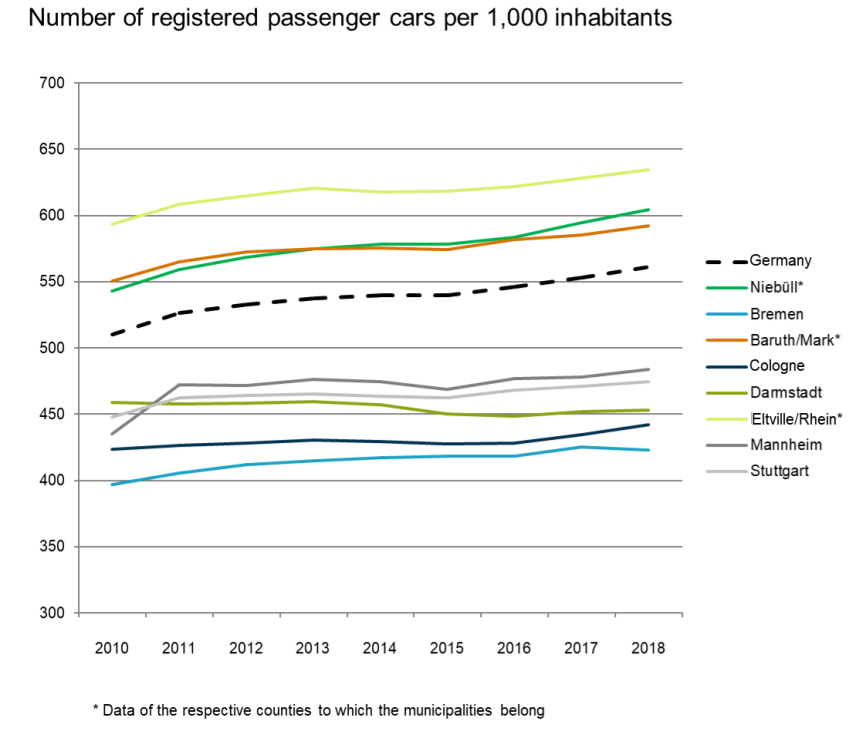
In order to operationalize and concretize the goals and fields of action, "Cologne mobile 2025" recommended that a transport development plan should be drawn up on the basis of the European SUMP guidelines. This mandate was given to the administration by the Cologne City Council in 2020. The "Sustainable Urban Mobility Plan" (SUMP) represents the update of the overall traffic concept (from 1992) and the further development of "Cologne Mobil 2025". In addition, the new city-wide urban development strategy "Cologne Perspectives 2030+" was published in September 2020. It defines goals for various areas of urban development – including mobility. Since a lot has changed in recent years, especially in the area of mobility, the SUMP will build on the principles of the "Cologne Perspectives 2030+" and the strategy paper "Cologne Mobile 2025", but will also update and deal with the defined goals and contents for the area of mobility in greater depth.

3.2.2 Personal motorised transport

In Paragraph 114 of the New Urban Agenda, the modal split is discussed but also the goal of reducing motorised individual transport, which can be approximated by the density of passenger cars. This indicator is defined as follows: "The number of registered passenger cars has been rising continuously for years. This exacerbates considerably the distribution problem of public space both in rural and urban areas and counteracts efforts to make transport systems more sustainable and, above all, more accessible. The tendency of political parties and administrations to expand infrastructure in response to traffic densities has often led to an even higher utilisation of infrastructure" (see e.g. Umweltbundesamt 2005). High traffic density also has negative consequences for healthy living conditions and environmental justice issues in the city and demands considerable economic and ecological costs.

Figure 22 illustrates the development of traffic density in Germany as a whole and in the partner municipalities. It shows that despite intensified efforts towards environmentally compatible and sustainable urban mobility in recent years (cf. Chapter 1.1.2), traffic density has increased slightly everywhere since 2010. As expected, it is higher in the smaller municipalities than in the large cities and higher than the average for Germany as a whole. In Eltville/Rhein, as a medium-sized centre, it is even at a significantly higher level than in the far more rural partner municipalities of Niebüll and Baruth / Mark. Eltville does not have a city-owned public transport system. Rather, the town is served by a regional transport company that in recent years has focused on expanding its services elsewhere. According to the partners involved, the public transport system is inadequate, especially in the peripheral areas of the city. As many residents commute to the larger cities in the Rhine-Main region, the traffic density in the city is above average.

Fig. 22: Development of car density 2010 – 2018



Source: Federal Motor Transport Authority (Kraftfahrtbundesamt)

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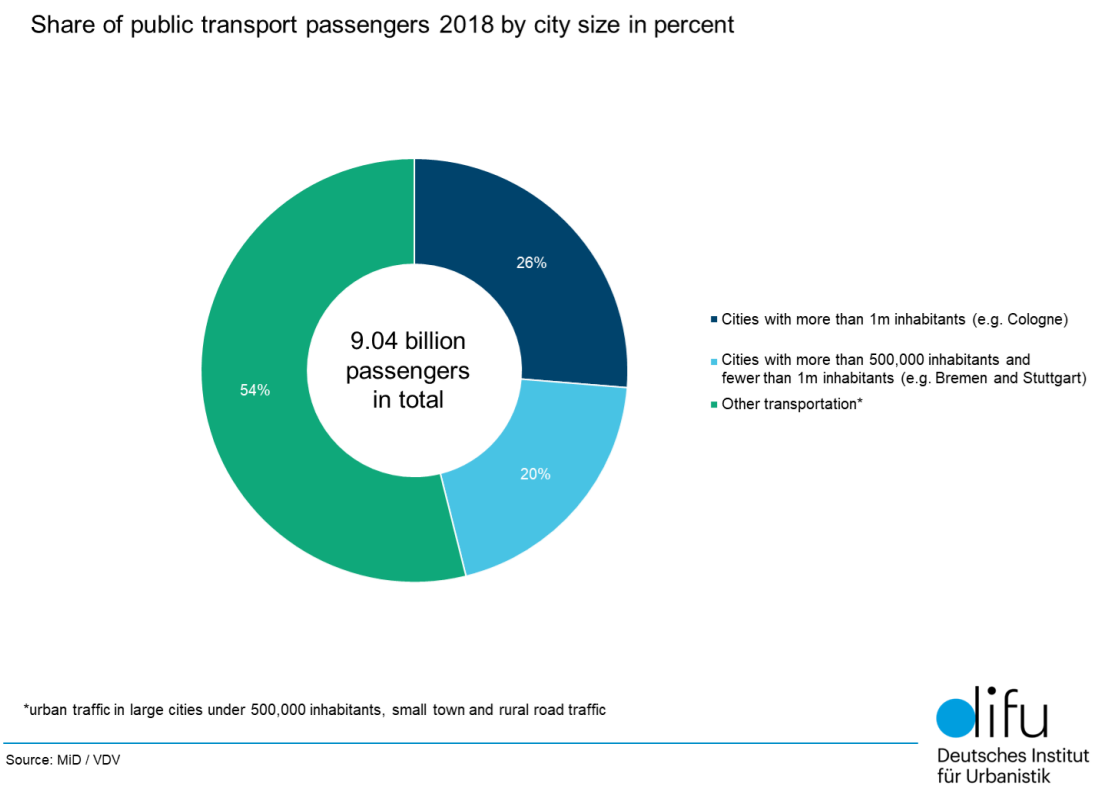
The aim of emission neutrality by 2050 in **Mannheim** includes ambitious goals for the design of sustainable mobility. For example, there is the 21-point cycling concept, which, in addition to expanding the cycling infrastructure, aims to improve the overall quality of road spaces to promote cycling and walking. Mannheim is one of five model cities for the reduction of air pollution, especially nitrogen dioxide. With a subsidy of about 28 million, the public transport system is being expanded and the fairs reduced by about one third. A comprehensive evaluation of this measure, especially with regard to the goal of improving the modal split, is still pending. However, automatic counting points suggest that the annual total number of cars had decreased before the Corona pandemic began.

3.2.3 Local public transport (ÖPNV)

In several places, the New Urban Agenda specifically addresses the expansion of and access to public transport as well as appropriate funding to ensure sustainable urban mobility (see Paragraphs 36, 114a, 114b, 118).

German metropolises with more than 1 million inhabitants Berlin, Hamburg, Munich and Cologne alone carry more than a quarter of the 9 billion passengers who use public transport in Germany each year. Together with other of the 12 largest cities in Germany, almost half of all public transport passengers are carried by buses and urban railways (underground, light rail, tram) (see Figure 23). These figures underscore the importance of public transport in urban areas, but also shows, against the background of the population distribution, that the importance of public transport for the absolute majority of citizens (approx. 80%) living in medium-sized cities, small towns and rural areas is relatively low.

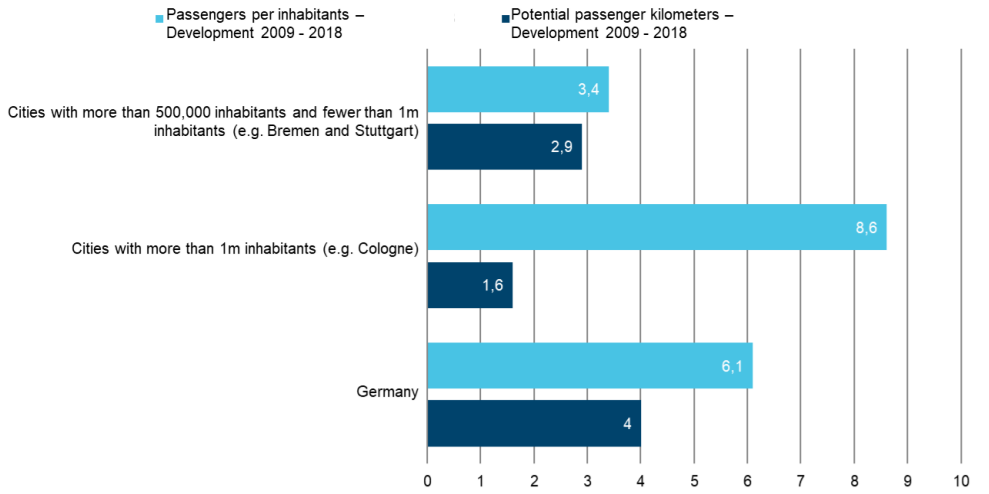
Fig. 23: Public transport passengers in 2018 by city size



If the demand for public transport is compared with the supply of the municipalities, growing differences can be observed with increasing city size (see Figure 24). Especially in the megacities, but also in the whole of Germany, adequately meeting the increasing demand in recent years has been impossible, so that the burden on infrastructure has increased considerably in some cases.

Fig. 24: Development of public transport supply and demand by city size 2009 – 2018

Development of public transport supply and demand by city size in percent



Source: VDV-Jahresbericht 2019/2020

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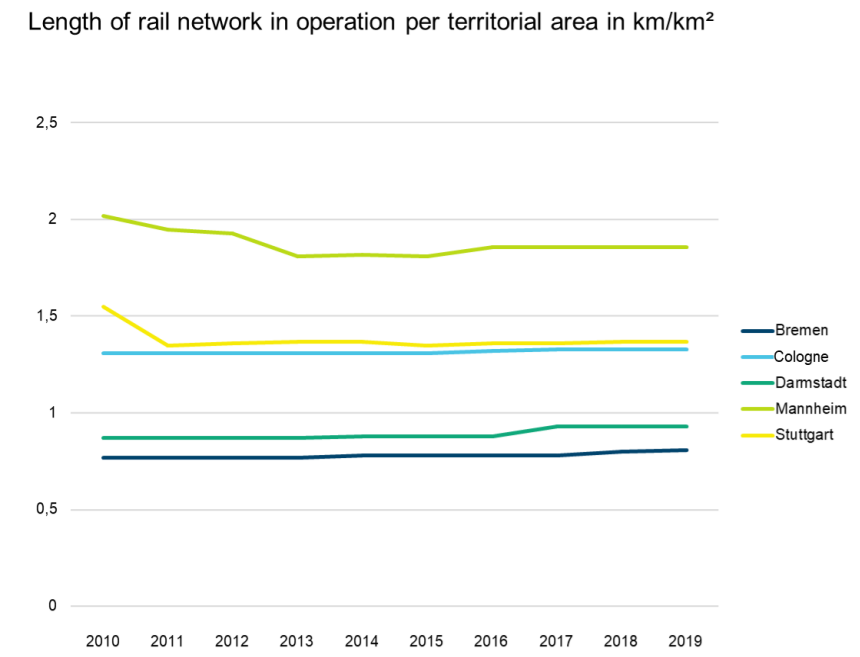
The rail network density in the five participating cities in Figure 25 additionally supports the need for improvements in public transport – here especially in rail transit. For the observation period from 2010, it is clear that this indicator has largely stagnated and, in the case of Mannheim, even declined, which could be due to the decommissioning or dismantling of freight transport infrastructures.

Fig. 25: Development of rail network density in selected cities 2010 – 2019



Source: IÖR Monitor according to AdV and ATKIS Basis-DLM

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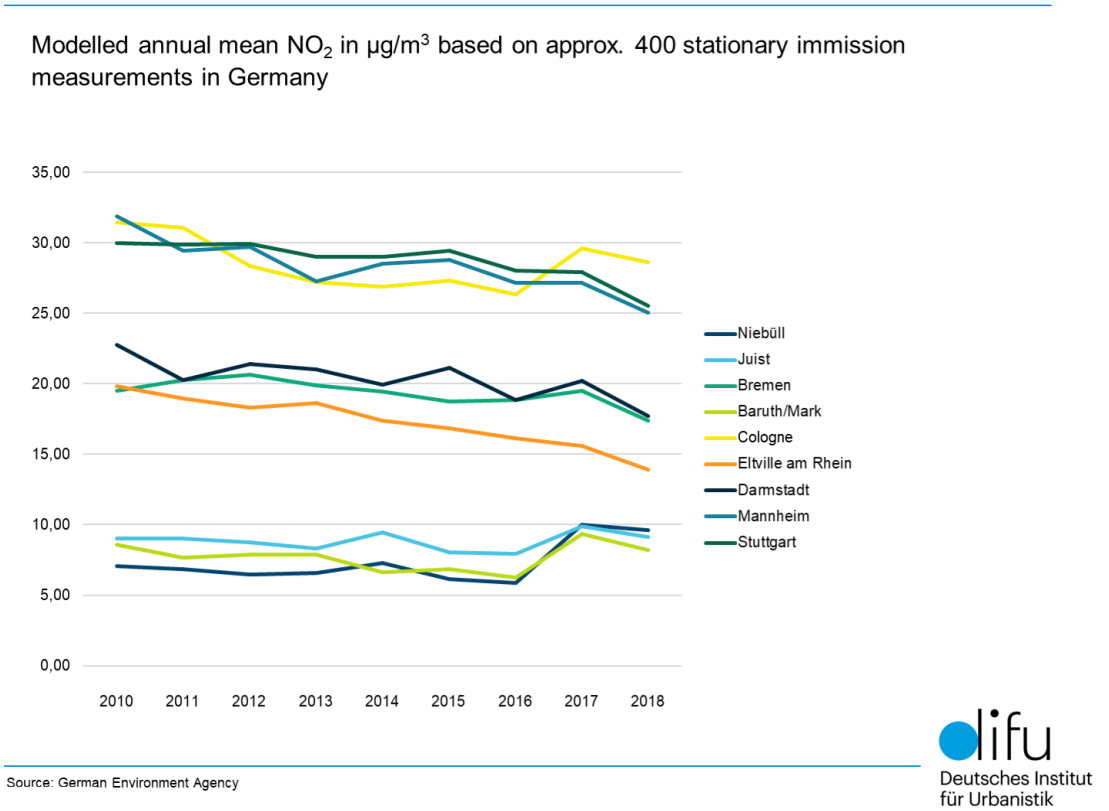
3.2.4 Environmental impacts of mobility

All motorised means of transport – especially those powered by fossil fuels – emit environmental oxides that are both problematic for urban ecosystems and can affect the health of the population, resulting in considerable economic follow-up costs. The issue of health risks applies to traffic noise and air pollutants, especially particulate matter and nitrogen oxides and are usually greater for socially disadvantaged groups who predominantly reside in the more favourable locations, which are, however, more exposed to noise and pollutants. Therefore, this is also particularly problematic from a social perspective. The New Urban Agenda highlights the financial, environmental and public health costs of inefficient mobility, in Paragraph 54.

Figure 26 shows an estimate of the annual averaged and area modelled exposure to nitrogen dioxide at stationary ambient air monitoring stations in all partner municipalities. Overall, the load is decreasing, although this decrease is not constant. As expected, pollution is lowest in the three smallest municipalities and highest in the three largest cities. This is likely to correspond to the overall traffic volume. Figure 27 illustrates the pollution with particulate matter in an analogous way, indicating on the one hand a positive overall trend, but on the other hand relative alignment of the measured values across the municipalities.

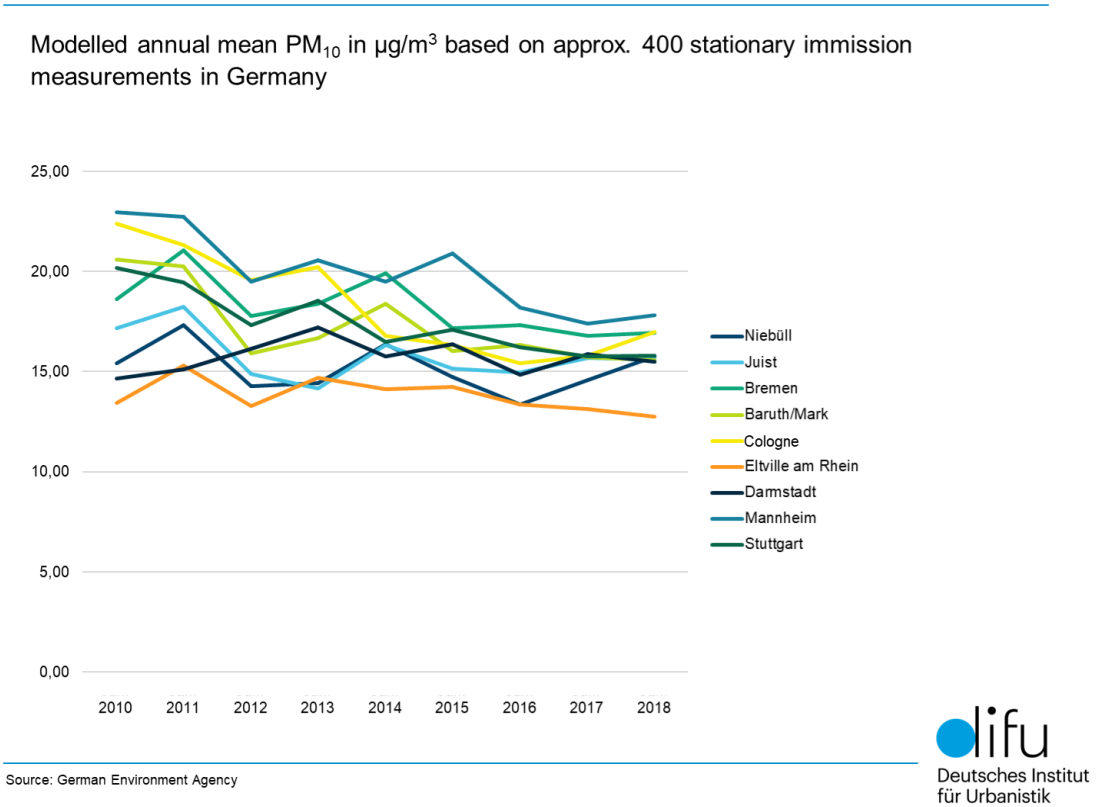
Fig. 26: Development of air pollution by nitrogen dioxide 2010 – 2018



The interim increase in NO_2 levels in municipalities such as Niebüll and Baruth/Mark could be due to a methodological change in which the spatial resolution of the studies was increased from 8x8 km to 2x2 km grids. This means that urban background pollution[2] in smaller municipalities in terms of area is better recorded and is not levelled out by the lower air pollution levels in the surrounding area.

[2] Agglomerations and cities are more affected by air pollution compared to the surrounding areas, as emissions are expected to be higher in densely populated areas. In addition to traffic, which is usually a major source, other sources of nitrogen oxides (e.g. from manufacturing and households) are distributed throughout the urban area. A baseline pollution develops over the urban area, which is called urban background pollution and is to be regarded as typical for urban residential areas. The modelling presented here in combination with measurements (optimal interpolation) represents precisely this average pollution of the urban background, but also means that, for example, concentration peaks on main roads cannot be reflected in the present resolution.

Fig. 27: Development of air pollution by particulate matter PM_{10} 2010 – 2018



In the **Free Hanseatic City of Bremen,** the Senate decided in 2019 to update the Bremen 2025 Transport Development Plan (VEP) from 2014 in some areas. This is being done for the four sub-strategies "Car-free city centre", "Parking in neighbourhoods", "Public transport strategy" and "City-regional transport concept". Pedestrian and bicycle traffic are not explicitly the focus of the partial update, because there is already a broad political consensus for the promotion of these modes of transport and for the implementation of corresponding measures. The update of the transport development plan is to be completed in summer 2021. The 2014 Transport Development Plan already envisaged improving the linking of transport systems and services in the environmental network between Bremen and the region. Another focal point was the sustainable and noticeable reduction of the effects of transport on people, health and the environment – including a reduction of carbon dioxide, nitrogen oxide and particulate matter emissions in accordance with climate and environmental protection goals as well as a reduction of traffic-related noise and land consumption for transport purposes.

3.2.5 Safe mobility

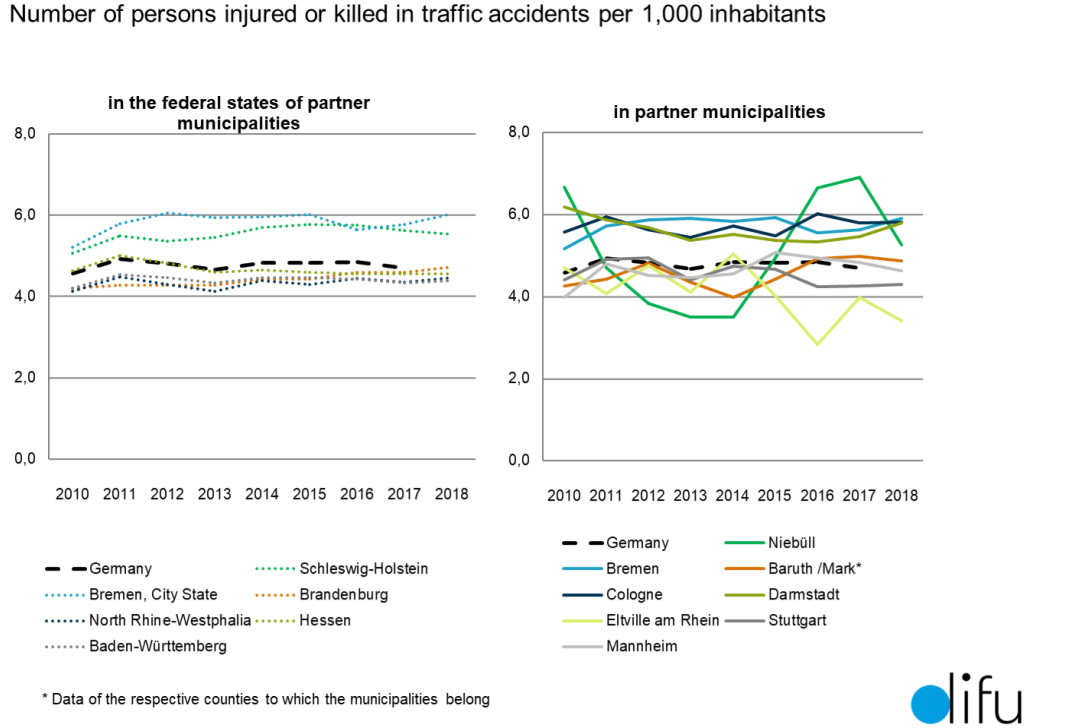
The goal of improving road safety "[…] with special attention to the needs of all women and girls, as well as children and youth, older persons and persons with disabilities and those in vulnerable situations […]" is provided in Paragraph 113 of the New Urban Agenda. This emphasises the safety of pedestrians – especially schoolchildren – and cyclists, as well as motorbike safety – although the latter is likely to be a priority, especially in countries of the global south.

The indicator catalogue from the project "SDG Indicators for Municipalities" contains the indicator "Number of traffic accidents". This is a measure for assessing general road safety. "Worldwide, road traffic accidents are the most common cause of death among adolescents and young adults, regardless of a country's economic situation.

There is "an imbalance in mortality and probability with regard to the mode of transport". This means that road users "who pose the least risk of an accident are disproportionately often injured or killed". Pedestrians and cyclists are therefore "more likely to be injured and killed by cars" (Peters et al. 2020).

Figure 28 shows the number of people injured or killed in traffic accidents per 1,000 inhabitants in eight partner municipalities – in each case in comparison with the corresponding values for the respective federal states and the German average. Overall, the development is stagnating. The strong fluctuations in Niebüll and Eltville are striking. This is probably mainly due to individual events that have a large impact in relation to the population of the small municipalities.

Fig. 28: Development of traffic accidents 2010 – 2018



Source: Federal Statistical Office and the Länder Statistical Offices

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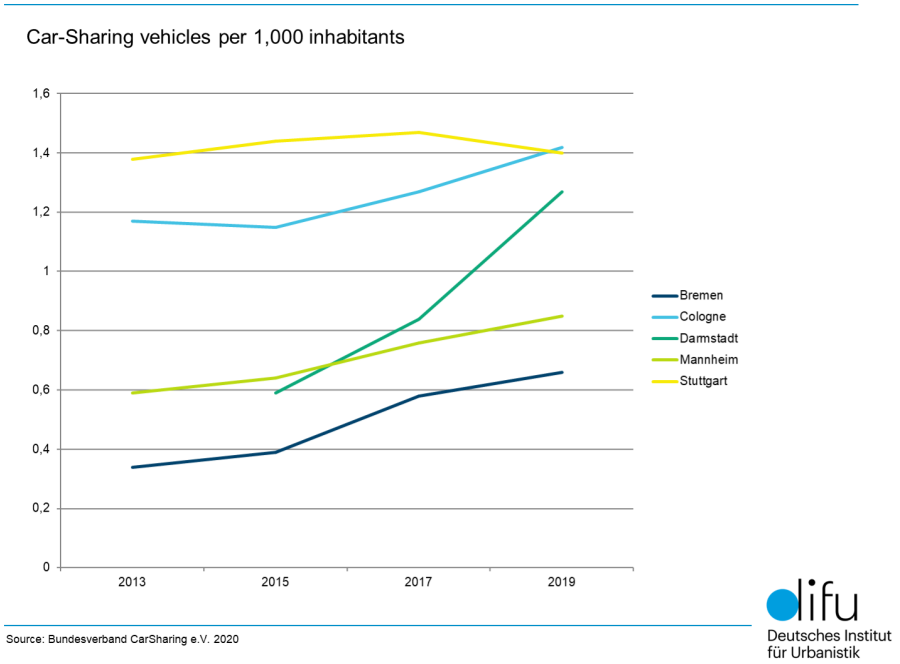
The main objectives in **Niebüll** in the field of mobility, include promoting walking and cycling, in order to make the city safer, to promote the mental health and well-being of Niebüll residents and visitors to the city, to reduce the number of traffic accidents, and the number of illnesses due to pollution and contamination of air, water and soil. In order to become a pedestrian and bicycle friendly city by 2023, short routes and clear traffic axes are to be created in the city. Special attention will be paid to local supply, recreation, tourism and school routes. In addition, the expansion and new construction of sidewalks and cycle paths, the installation of bicycle priority lanes, the expansion of the existing bicycle parking facilities at the railway station, improvements in cycling guidance, but also speed reductions for motorised traffic, such as the expansion of 30 km/h zones, as well as the safe design of school routes and their announcement to parents and pupils will be promoted. Niebüll has also been a member of "RAD.SH – Kommunale Arbeitsgemeinschaft zur Radverkehrsförderung in Schleswig-Holstein," (municipal work group for the promotion of bicycle transport) since 2017. Thereby, Niebüll wants to continuously improve and expand the range of services for cyclists and pedestrians in the sense of the mobility transition.

3.2.6 New mobility services

In recent years, the range of mobility options called for by the New Urban Agenda has grown steadily. In this way, access to sustainable transport systems has been strengthened (Paragraph 114). In particular, new and mostly digital-based mobility offers and services can enable sustainable movement within and between communities. A comprehensive variety of choices from car sharing to ride sharing and car-pooling to multimodal journey planning services mostly only exist in urban areas, as the fixed costs are too high to allow operators to perform economically, especially in the case of classic sharing options (B2C) in less populated regions.

With a growth of over 25% compared to the previous year, there were around 25,400 Car-Sharing vehicles in Germany in 2020. Car-Sharing services were able to benefit from digitalisation of access, making reservation and booking easier and more customer-friendly. While the market is experiencing saturation in large cities with high population numbers, Car-Sharing is spreading more and more in medium-sized cities such as Darmstadt (see Figure 29). More than 95% of large cities with more than 100,000 inhabitants are served by station-based or free-floating Car-Sharing services. Although this proportion of municipalities with Car-Sharing services decreases as the number of inhabitants decreases – only 4.3% of municipalities with less than 20,000 inhabitants have Car-Sharing services – in medium-sized municipalities with up to 50,000 inhabitants, the proportion is still 46.8%. More than 2 million citizens are registered as Car-Sharing customers in Germany. Overall, however, measured in terms of traffic volume, Car-Sharing services still represent a niche option.

Fig. 29: Development of Car-Sharing supply in selected partner municipalities 2013–2019



Source: Bundesverband CarSharing e.V. 2020

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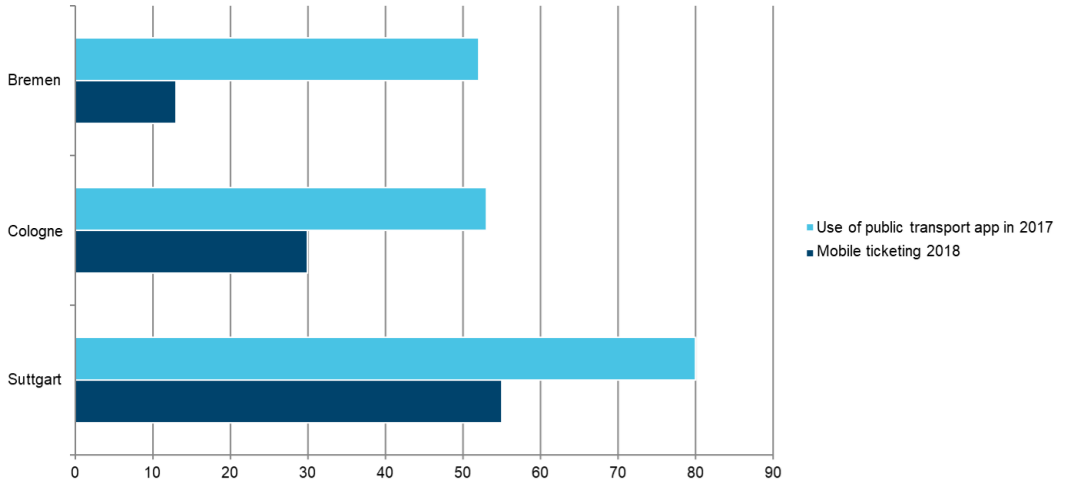
According to the New Urban Agenda, the use of sustainable transport systems should also be promoted through the improved provision of complementary services (Paragraph 66). For example, access to modern information and communication technologies enables interaction and connectivity between urban and rural areas for all people. Public transport apps and mobile ticket purchasing make the use of sustainable mobility options and services much easier. A population survey on public transport app use in 2017 shows that many people already use public transport apps. In Stuttgart, this is the case for as many as 80% of respondents. However, mobile ticket purchase is less frequently adopted (see Figure 30). Accessibility for the entire population through a mobile network plays an essential role here and should also be strengthened with regard to the New Urban Agenda (Paragraph 50).

Fig. 30: App use in public transport in selected partner municipalities 2017 / 2018

App use in public transport in selected municipalities
in percent of respondents



Question 1: Do you use public transport apps?
Question 2: Have you ever bought a ticket for public transport on your smartphone?

n = 1049

Source: eye square GmbH (ed.), BVG (2018): Tickets auf dem Smartphone, Berlin.

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To reduce car-dominated journeys through the 12 districts of **Baruth/Mark** and as an option for tourists, a call bus was set up in 2020 to support the move to transport sustainability in rural areas. It connects the Baruth railway station with the town centre and with a nearby industrial area, as well as with most local districts. The service, which can be booked via app, is a project jointly financed by Baruth / Mark and the county Teltow-Fläming for the one-year test phase. Further measures of the Mobility Concept 2030 in the county Teltow-Fläming focus, among other things, on an intensified implementation of cycle path infrastructure needs, and conversion of the county administration's vehicle fleet in the course of the scheduled fleet transition to environmentally friendly vehicles. To illustrate what climate-friendly mobility looks like and could look like in the future, the travelling exhibition "Mobility Today – Tomorrow – 2050" was presented to citizens of the county Teltow-Fläming in 2019. The interactive exhibition explained, among other things, what influence the transport sector has on the atmosphere and climate change, what modes of transport will be available in the near future, and what transport will look like in 2050.

Despite the high growth rates of new mobility services in recent years, the absolute usage figures currently remain too low and concentrated in larger urban areas for a significant contribution to be made to transport transition for municipalities and citizens.

4. Conclusions

A comprehensive assessment of Germany's progress with regard to implementing the goals of the New Urban Agenda in recent years is only possible to a limited extent, as analysis here is constrained to the thematic fields of climate change and mobility. These conclusions are therefore of a methodological nature and refer primarily to the experience gained from practical cooperation with the partner municipalities.

The above documentation and analysis of municipal sustainability activities with regard to the New Urban Agenda and the 2030 Agenda, vividly illustrates the heterogeneity of the counties, cities and municipalities in the Federal Republic of Germany. Each of the more than 11,000 municipalities in Germany has its own characteristics – whether these are topographical, settlement structure and/or social conditions. Such varying framework conditions also influence specific political and civic prioritisation of sustainability activities with respect to the Sustainable Development Goals (SDGs) and the New Urban Agenda. Furthermore, awareness of sustainability issues varies greatly among municipalities. In all the cities and municipalities with which we were able to cooperate for the preparation of this progress report, the topic is organisationally located in very different places within the respective administrations. These range from separate staff units, to specialised departments for urban development and/or environment, and to departments for city marketing.

The sectoral structure of German local government often means that interdisciplinary exchange on such a cross-section of issues is difficult to achieve or is still in its infancy in many municipalities. It is also not uncommon for there to be a lack of awareness of the issue of sustainability in large parts of urban society. In peripheral and sparsely populated areas, sustainability is often equated with climate protection. Elsewhere, sustainability is discussed primarily in economic terms, focussing above all on such advantages for the respective region. In many municipalities, a number of sustainability measures are already being implemented or at least discussed, while not consciously included under the umbrella of the sustainability aims of the New Urban Agenda and the 2030 Agenda. Moreover, this can be seen as a result of Local Agenda 21, which regarded sustainability as a voluntary task with the design of monitoring left entirely up to municipal self-determination and lacking t a common frame of reference for indicators.

The systems that municipalities in the Federal Republic of Germany have for monitoring their own sustainability activities are at varying stages of development. They range from comprehensive and indicator-based sustainability reports to initial qualitative assessments, initially used to determine links to the goals of the New Urban Agenda and the SDGs in the municipalities' own work. Considerable efforts are still required to establish an inclusive and standardised monitoring system in Germany. This is particularly important in addressing the system of indicators, which so far lacks a common base. Central distinguishing features are the foundation of data collection and the availability of official data. However, the value and feasibility of a comprehensively standardised sustainability monitoring system for municipalities remains to be discussed politically. Considerable differences exist between the municipalities, particularly in the small municipalities, where it is apparent that a large number of the sustainability indicators are only of limited suitability for their work. Future discussions around research are needed as well as ways to cushion this "scale blindness" of the indicators available today.

In order to intensify progress in the implementation of the New Urban Agenda and the 2030 Agenda, it is therefore necessary to revise the level of detail practiced in current municipal monitoring systems. Only when a large number of municipalities provide a systematic account of their own sustainability activities can the aggregate contribution of the municipal level to the achievement of the New Urban Agenda and the SDGs as a whole be assessed. However, we must not lose sight of the actual purpose of such monitoring. A systematic and indicator-based recording of municipal sustainability activities contributes significantly to raising political and social awareness. Ultimately, this is also the motivation for all the municipalities with which we have worked, in the context of this report. Raising the awareness of their own administration and population is of central importance – specifical-

ly regarding a "global commitment to sustainable urban development as a critical step for realizing sustainable development in an integrated and coordinated manner at the global, regional, national, subnational and local levels, with the participation of all relevant actors" (Paragraph 9 New Urban Agenda).

The technical and practical challenges municipalities experience in establishing sustainability monitoring, and accelerating expansion of sustainability activities, include a lack of human resources, a situation which is less acute in the larger cities. Municipalities with fewer than 5,000 inhabitants and an administration with, for example, 25 employees, each of whom has to work on various topics, typically have a minimal time budget for elaborate sustainability monitoring. Moreover, such municipalities naturally do not have their own statistics departments. Here, networking and cooperation within and across counties play an important role. However, city size does not always correlate with advanced sustainability management. Small and medium-sized municipalities have proven it possible to proceed very systematically. In such cases, it is usually direct concerns, for example from climate change and urbanisation, that become drivers for active sustainability management – not infrequently in combination with local networks and an administrative leadership that has declared the topic a "top priority". But even in these municipalities, the data issue remains the stumbling point. Current data from official statistics are only available for some of the sustainability indicators for all local authorities in Germany. Thus, the municipalities have to collect their own data for many indicators, which is always a question of resources.

Citizen surveys could be helpful in contributing to municipal monitoring of sustainable development, including a more in-depth (scientific) examination of so-called subjective sustainability indicators, and the preparation of further national progress reports on the future implementation of the New Urban Agenda. For example, citizens' perceptions of the sustainability activities of their municipalities could be recorded, with responses to question of efforts made for example in the area of climate protection and climate adaptation. Behind this is the consideration that municipal sustainability management goes hand in hand with changes, cuts, opportunities and the conversion of people's habits. This requires the acceptance of the citizens. However, sustainability indicators available so far are not (yet) able to reflect people's perceptions, assessments and preferences. On the other hand, subjective indicators could also be used to tap into topics that (so far) cannot be measured with objective data at the municipal level, or only at great expense, for example in the areas of consumption, social cohesion or life satisfaction.

Potential contributions to municipal sustainability can be found in the monitoring of budgetary management as well as various forms of circular economy in cities. The budgets of the public sector are the central steering instrument of policy. All measures that are to be implemented in a municipality must be included in the budget. Therefore, the budget of a municipality is also an ideal starting point for linking the distribution of financial resources to sustainability goals in an impact-oriented manner. Shifting from a linear economy to a circular economy is equally difficult to operationalize as sustainable financial and budget planning, but can be equally full of potential. Reducing resource consumption and waste generation comes with a range of socio-economic benefits, especially for cities. From the possibility of urban production, to safe material flows in resilient infrastructures, to the creation of new jobs for all skill levels, cyclical environmental innovations can contribute to a liveable community. However, both approaches remain at the conceptual level, both in terms of municipal implementation and in the identification and development of indicators. Therefore, the focus must be on continuously increasing the level of detail in these thematic fields in order to support different administrative levels with successful precedents and recommendations for action.

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Appendix I

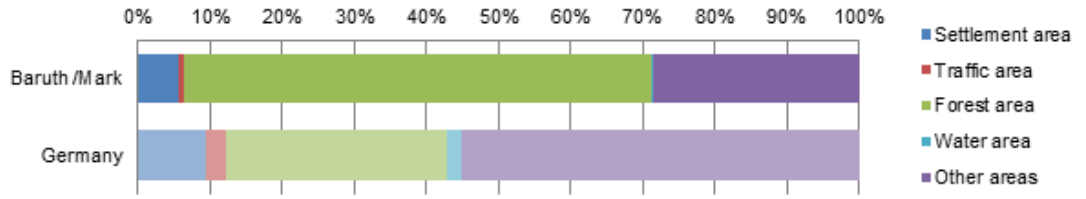
Profile of the partner municipalities

Baruth/Mark

in the county Teltow-Fläming

State	Brandenburg
Population (as at: 31.12.2018)	4,211 inhabitants
Population density	18 inhabitants/km²
City foundation	1616 (granting of the town charter)
Special features	Among the 100 municipalities with the largest surface area in Germany

Total area Baruth/Mark: 233.62 km²



Municipality type	Rural community, stable development
Central function	None
Employees of municipalities and municipal associations	9 per 1,000 inhabitants
Relevant awards	• Signatory municipality of the model resolution "2030 Agenda for Sustainable Development: Shaping Sustainability at the Municipal Level" of the German Association of Cities and Towns and the Council of European Municipalities and Regions/German Section

Overview Climate Protection and Adaptation

The experiences of the town of Baruth/Mark in the field of sustainability exemplify the challenges faced by small, rural municipalities in districts with large surface areas. Although the town already relies on renewable energies and aims for CO_2 neutrality and energy self-sufficiency by 2030 according to its own energy mission statement, Baruth/Mark – located in the county Teltow-Fläming – lacks the personnel to establish and consolidate a systematic sustainability management. The county surrounding the municipality, on the other hand, has greater resources to actively implement measures. For example, in 2015, more than 100 percent of the electricity sold in Teltow-Fläming was already produced from renewable energy sources. In addition, the county is a recognised 100 per cent renewable energy region, a member of Klima-Bündnis e.V., a participant in the Federal Government's "Climate Protection Action Alliance 2020" and also involved in international networks. In its mission state-

ment, the county acknowledges its responsibility for climate protection measures, which is also reflected in its energy saving and climate protection programme, which was updated again in 2018. Continuous training of the employees of the county administration and the "energy saving models in county schools", which have been running since 2012, also contribute to an annual reduction of CO_2 emissions by more than 350 t and a relief of the county budget by more than 140,000 euros per year.

Mobility overview

To reduce car-dominated journeys through the 12 districts of Baruth / Mark and as an option for tourists, a call bus was set up in 2020 to support the move to transport sustainability in rural areas. It connects the Baruth railway station with the town centre and with a nearby industrial area, as well as with most local districts. The service, which can be booked via app, is a project jointly financed by Baruth / Mark and the county Teltow-Fläming for the one-year test phase. Further measures of the Mobility Concept 2030 in the county Teltow-Fläming focus, among other things, on an intensified implementation of cycle path infrastructure needs, and conversion of the county administration's vehicle fleet in the course of the scheduled fleet transition to environmentally friendly vehicles. To illustrate what climate-friendly mobility looks like and could look like in the future, the travelling exhibition "Mobility Today – Tomorrow – 2050" was presented to citizens of the county Teltow-Fläming in 2019. The interactive exhibition explained, among other things, what influence the transport sector has on the atmosphere and climate change, what modes of transport will be available in the near future, and what transport will look like in 2050.

Overview Digitisation

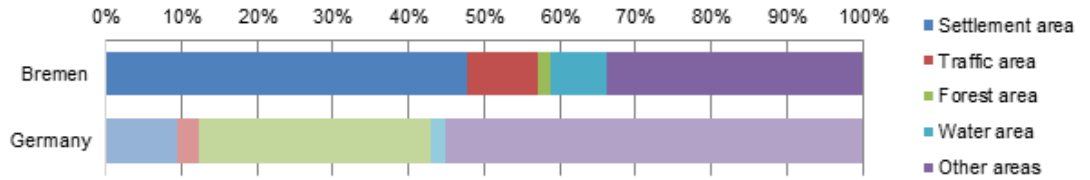
At the municipal level, the focus of digitisation efforts is on schools and especially on equipping them with broadband access and the corresponding hardware. For example, in the county Teltow-Fläming and all other towns and counties in Brandenburg, the contracts for the installation of fast fibre-optic connections have been awarded. By 2021, every school is also to be equipped with an online learning platform. Beyond the school infrastructure, it can be assumed that further measures will be taken in the short term in the course of the nationwide online access law to enable citizens to carry out many administrative procedures digitally.

With the Digital Brandenburg Strategy for the Future, a total of seven fields of action with political objectives and 202 measures for short-, medium- and long-term implementation were defined at the state level in 2018. The central point of contact in the area of digitalisation is the DigitalAgency Brandenburg, which was founded in 2019 as one of the first results of the digital strategy. The agency's tasks include initiating, coordinating or managing digital projects of various kinds, with the exception of e-government. The agency is intended to bundle individual projects across the board and bring together best practices through knowledge transfer. This addresses municipalities, municipal economic development agencies and networks, in which the DigitalAgency acts as an advisor and mediator free of charge. The fields of action cover, among other things, participation through efficient infrastructure, learning and digital competence, digital transformation in business and work or attractive living in Brandenburg. In concrete terms, projects such as municipal apps, a school cloud or a 5G model region were supported.

Free Hanseatic City of Bremen

State	Bremen
Population (as at: 31.12.2018)	569,352 inhabitants
Population density	1,746 inhabitants/km²
City foundation	1303 (granting of the town charter)
Special features	Together with Bremerhaven, part of the city state of Bremen

Total area Bremen: 326.18 km²



Municipality type	Independent large city, growing
Central function	Regional centre
Employees of municipalities and municipal associations (as of: 2016)	26.7 per 1,000 inhabitants
Relevant awards	• Signatory municipality of the model resolution "2030 Agenda for Sustainable Development: Shaping Sustainability at the Municipal Level" of the German Association of Cities and Towns and the Council of European Municipalities and Regions/German Section • Fairtrade Town • Declaration Climate Emergency – Climate Alliance (2019) • Climate Active Municipality 2018" competition Award winner in the category Municipal Climate Activities and Nutrition • Member of the Working Group of Bicycle-Friendly Municipalities of Lower Saxony/Bremen e. V. (AGFK)

Overview Climate Protection and Adaptation

In December 2009, the Senate of the Free Hanseatic City of Bremen adopted the Climate Protection and Energy Programme (KEP) 2020, which defines the goals and strategies of Bremen's climate protection and energy policy until 2020. The programme was based on the binding target of reducing the Hanseatic City's CO_2 emissions by at least 40 percent by 2020 compared to 1990. In 2018, the update of this programme was adopted, as this original target could not be achieved. A completely new climate protection strategy is currently being developed. Until

now, the climate protection measures of the Hanseatic City focused on various strategic fields of action. These included the promotion of climate-friendly electricity use and the expansion of climate-friendly electricity generation (among other things through an aggressive expansion of wind energy) as well as the expansion of local and district heating supply based on combined heat and power and heat from waste treatment. In addition, an energetic refurbishment of the building stock and the realisation of demanding energy standards in new buildings as well as a reduction of CO_2 emissions from public buildings and companies were pushed. Bremen also focused on the expansion of local public transport, the promotion of cycling and walking, an optimisation of traffic flow and an increased use of car sharing.

Mobility overview

In the Free Hanseatic City of Bremen, the Senate decided in 2019 to update the Bremen 2025 Transport Development Plan (VEP) from 2014 in some areas. This is being done for the four sub-strategies "Car-free city centre", "Parking in neighbourhoods", "Public transport strategy" and "City-regional transport concept". Pedestrian and bicycle traffic are not explicitly the focus of the partial update, because there is already a broad political consensus for the promotion of these modes of transport and for the implementation of corresponding measures. The update of the transport development plan is to be completed in summer 2021. The 2014 Transport Development Plan already envisaged improving the linking of transport systems and services in the environmental network between Bremen and the region. Another focal point was the sustainable and noticeable reduction of the effects of transport on people, health and the environment – including a reduction of carbon dioxide, nitrogen oxide and particulate matter emissions in accordance with climate and environmental protection goals as well as a reduction of traffic-related noise and land consumption for transport purposes.

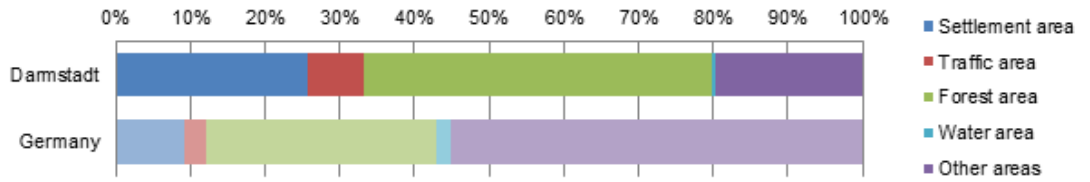
Overview Digitisation

In 2016, the Free Hanseatic City of Bremen adopted the strategy "Administration 4.0 – an e-government and digitalisation strategy for the Free Hanseatic City of Bremen" as part of the "Future-Oriented Administration" (ZOV) programme. This paper builds on the IT strategy of 2014 and focuses primarily on issues of complete digitalisation of internal administrative processing and coordination processes, electronic data exchange between authorities and citizens, as well as transparency and open data. As part of the Federal Government's broadband funding programme, the Hanseatic City of Bremen has also received a funding decision for underserved areas in the outskirts of the city. In 2020, the telecommunications companies were able to carry out the corresponding expansion work in the subsidised areas. These will be completed in 2021.

Darmstadt City of Science

State	Hesse
Population (as at: 31.12.2018)	159,207 inhabitants
Population density	1,304 inhabitants/km²
City foundation	1330 (granting of the town charter)
Special features	Title "City of Science", home to many universities and research institutions

Total area Darmstadt: 122.07 km²



Municipality type	Independent large city, growing
Central function	Regional centre
Employees of municipalities and municipal associations	23.5 per 1,000 inhabitants
Relevant awards	• Sustainable City Dialogue – Mayors for Sustainable Development in Municipalities by the German Council for Sustainable Development (RNE) • Fairtrade Town • Declaration Climate Emergency – Climate Alliance (2019) • #climate emergency at every town hall (2019) • Signatories of the Declaration "Biological Diversity in Municipalities • Member: NAH MOBILITY – Mobile Hesse 2030

Overview Climate Protection and Adaptation

Overall, the city's direct impact on the climate – estimated from the carbon footprint – has improved significantly in recent years, largely attributed to improved energy efficiency in industry and changes in energy production. A political decision (“Höchste Priorität für Klimaschutz – Weltklima in Not – Darmstadt handelt“) of September 2019 deposited the intention to significantly increase the active efforts of the municipality in the field of climate protection – equivalent to a climate emergency, but not verbalised as such. With regard to climate adaptation, one focus is currently on the creation of a new forest mission statement. In the "City Tree" project, climate data is measured in a wooden installation at central places in the city, the air is cleaned with moss filter walls and – provided with seating – a contribution is also made to climate communication.

Mobility overview

In a "4x4 programme", Darmstadt has determined to invest an additional four million per year for the expansion of the cycling infrastructure. In the modal split, the share of cycling has increased slightly. A particular challenge for the city is the strong growth, which brings with it a considerable additional share of commuters – more than twice as many commuting in as commuting out – and significantly intensifies road traffic from the region. With a bypass road, at least the through traffic in the city could be significantly reduced. Traffic counters integrated into speed cameras are already in use; in addition, traffic lights are equipped with cameras and preparations are underway to control traffic flows using nitrogen oxide measuring systems.

Overview Digitisation

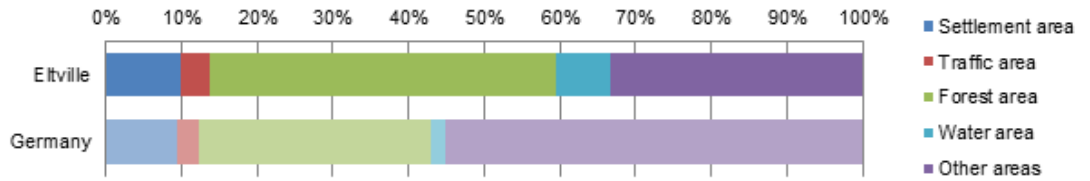
Digitalisation has a high priority in the City of Science Darmstadt. This is evidenced not least by the BITKOM "Digital City" competition won in 2017. In a smart city ranking by the BITKOM association, Darmstadt ranks among the top 10 of over 80 municipalities. The developments are correspondingly diverse at present, ranging from a high level of coverage with sensor data both for traffic and in the areas of weather and climate, to advanced broadband expansion, to the fact that citizens are in general very open to digital solutions. Most of the projects at the interfaces between administration and the population are bundled in the "Digitalstadt Darmstadt GmbH". In addition to administration the field of action, the company is pursuing goals in a further 14 fields of action with the vision of setting up the Digital City of Darmstadt as a pioneer and international beacon of improved everyday urban life through new technologies.

Eltville on the Rhine

in the county Rheingau-Taunus-Kreis

State	Hesse
Population (as at: 31.12.2018)	17,077 inhabitants
Population density	365 inhabitants/km²
City foundation	1332 (granting of the town charter)
Special features	Tourist significance as a wine, sparkling wine and rose town

Total area of Eltville am Rhein: 46.77 km²



Municipality type	Larger small town, stable development
Central function	Medium-sized centre
Employees of municipalities and municipal associations	7 per 1,000 inhabitants (eltville.de)
Relevant awards	• Signatory municipality of the model resolution "2030 Agenda for Sustainable Development: Shaping Sustainability at the Municipal Level" of the German Association of Cities and Towns and the Council of European Municipalities and Regions/German Section • Fairtrade Town • German Sustainability Award for Cities and Municipalities (winner 2021, finalist 2019)

Overview Climate Protection and Adaptation

In cooperation with the county Rheingau-Taunus-Kreis, Eltville am Rhein has participated in the preparation of a climate protection concept at county level. In the administration union of Rheingau, an initial CO_2 balance has also been drawn up, which is being continued on a city-specific basis with regard to the city's own properties and thus serves to establish "climate controlling". In the future, Eltville seeks to concentrate its climate protection efforts on the development of individual neighbourhoods, with a focus on energy efficiency and renewable energies. For the area of climate adaptation, climate forecasts were evaluated for the Rheingau and possible effects of climate change on viticulture were investigated as part of the network and research project "Klia-Net – Collaborations for Climate Adaptation in the Rheingau". Furthermore, heavy rainfall simulations were created and a comprehensive catalogue of climate adaptation measures was developed.

Mobility overview

A comprehensive mobility concept is being developed at county level. Eltville is planning its own inner-city traffic concept, before which a local mobility check sponsored by the state of Hesse will be carried out. In addition, there are initial ideas for a change in traffic routing in the city center, which is primarily based on traffic calming of individual sections. Some of these ideas have encountered resistance from citizens and the retail trade. The designation of an initial traffic-calmed zone has proved positive, as it has been accepted by the citizens. The fact that many people in Eltville still stick to their cars is due to the comparatively inadequate local public transport services – especially in the peripheral urban areas – especially since Eltville does not have its own transport company and is instead part of a supra-regional transport association. Negotiations with Deutsche Bahn (German Railways) on the modernization of the station's attractiveness and barrier-free expansion are proving difficult. With regard to individual mobility, however, the administration is setting a good example by using e-vehicles and e-bikes. E-car sharing with three vehicles was recently introduced for citizens and businesses. Promoting cycling is also high on the agenda.

Overview Digitisation

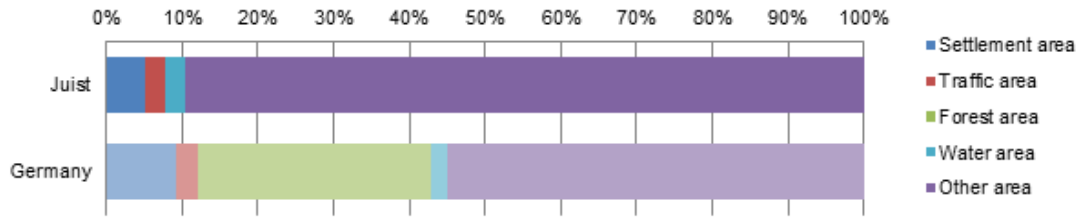
In recent years, significant progress has been made in digitisation, supported by a dedicated digitisation strategy and a city-owned administration office, in offering digital services and improving electronic workflow within the administration. Since the beginning of the Corona pandemic, efforts have focused on the establishment of home office workstations in the administration, increasing the number of such workstations from 5 previously to 70. In addition, a digital citizens' dialogue was carried out during the pandemic with funding from the Bertelsmann Foundation, which is to be converted into a permanent platform. With a view to the introduction and realisation of "smart" technologies in the area of public infrastructures – such as street lighting, green space irrigation, etc. – initial planning processes are currently underway in Eltville.

Juist

in the county Aurich

State	Lower Saxony
Population (as at: 31.12.2018)	1,524 inhabitants
Population density	93 inhabitants/km²
City foundation	1398 (first documentary mention)
Special features	Island municipality

Total area Juist: 16.43 km²



Municipality type	Rural community, stable development
Central function	None
Employees of municipalities and municipal associations **(Status: 2020)**	30 per 1,000 inhabitants
Relevant awards	• Signatory municipality of the model resolution "2030 Agenda for Sustainable Development: Shaping Sustainability at the Municipal Level" of the German Association of Cities and Towns and the Council of European Municipalities and Regions/German Section • Fairtrade Town • Award "Germany's Most Sustainable Small Towns and Municipalities" 2014 and 2015

Overview Climate Protection and Adaptation

Climate protection activities as part of environmental and nature protection have a very high priority on Juist. As early as 2010, the local council decided that the North Sea island should be climate-neutral by 2030 and CO_2 emissions must thus be reduced to zero. This is to include offsetting only after all possibilities have been exhausted. With this declaration of intent, the island municipality of Juist supports the Sylt Declaration of the environment ministers of the Netherlands, Germany and Denmark, which declares that the area of the Wadden Sea World Heritage Site is to become climate neutral by 2030. In order to achieve this ambitious goal, the climate protection project "Climate Island Juist" was developed as a joint project with the energy supplier EWE AG. With the climate protection goal and the climate protection project "Klimainsel Juist", Juist already successfully participated in the "Klima kommunal" competition in 2010. Since 2016, the overall destination Juist has also been certified as a Sustainable Destination by TourCert. The municipal properties of Juist take a pioneering role through compensation, as they are powered by 100% green electricity and compensation certificates for emissions through the energy sources natural gas for heating. Juist also has a policy for sustainable purchasing, including green electricity, goGreen, organic products, fair trade, green IT, climate-neutral printing of brochures, etc. According to the greenhouse gas balances commissioned by the municipality, for example, almost 20,000 t CO_2 emissions were generated on the island in 2014. With measures such as the expansion of LED technology in street lighting, which has been prevalent for a long time, an e-load bicycle, further personnel in climate protection or also the recently launched climate workshops with pupils, the emissions are to be continuously reduced.

Mobility overview

As Juist is a car-free island, sustainability activities in the field of mobility essentially touch on the means of access to the island – i.e. the ferry system and train and air connections. Therefore, the "Integrated Energy and Climate Protection Concept (IEKK) Tourism Triangle Juist, Norderney, Baltrum and Norden" foresees that the ferry service from Norden to Juist and Norderney should be improved in terms of energy together with the Frisia shipping company. For this purpose, there is already a research project with the participation of Juist, which initially focuses on substituting the diesel-powered generators for on-board electricity with fuel cells. After completion of the first phase with the generation of on-board electricity, the applicability of fuel cells for ship propulsion is also to be tested. The use of gas engines is also conceivable. In view of the current developments in shipbuilding and engine development, a gradual introduction of ships powered by LNG (liquefied natural gas) is conceivable for all

The ferry's service areas and operational profiles up to the year 2020 are a concrete possible scenario. As Juist is a tide-dependent island, an improved connection of the ferry to rail transport is not possible. More than 30% of guests already travel by train. Another 25% would consider doing so if, for example, the connection (shorter waiting times) was better. For this reason, it is considered sensible to improve the harbour situation so that a longer waiting time becomes attractive, e.g. through luggage stations, gastronomy, exhibition on the World Heritage Site, etc. In addition, the island is examining the installation of electric charging stations for e-vehicles incl. service at the parking spaces of the Frisia shipping company at the pier. At the same time, e-cars, e-scooters and e-bikes have already been offered for rent to the citizens of Juist and tourists for a year. The former receive a discount on the rental of the vehicles and on ferry trips.

Overview Digitisation

Measures for digitalisation in and on Juist mainly relate to the island's tourism options. In this context, for example, the Juist app was developed, which provides information on accommodation, leisure activities and weather forecasts, as well as information on carpooling and the accessibility of paths. The mobility options of the island and the surrounding area are also bundled in the app. All information is stored on a climate-neutral server of the

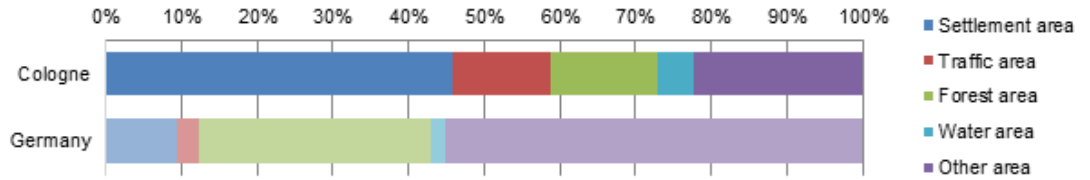
spa administration. To use the app, the island has a very well-developed broadband connection within the town as well as "FRISIA wireless", a project of the local shipping company and mySPOT with the aim of providing free WLAN in shops and localities on the German North Sea coast.

The municipality is also planning to digitally convert its administrative activities with the help of the e-file, for which training for employees was organised in 2020. This is considered a first step towards more digital services on the part of the municipality.

Cologne

State	North Rhine-Westphalia
Population (as at: 31.12.2018)	1,091,819 inhabitants
Population density	2,697 inhabitants/km²
City foundation	50 AD (granting of the town charter)
Special features	Fourth-largest city and one of four cities with over a million inhabitants in Germany

Total area Cologne: 405.01 km²



Municipality type	Independent large city, growing
Central function	Regional centre
Employees of municipalities and municipal associations	18.95 per 1,000 inhabitants (as of 2017)
Relevant awards	• Signatory municipality of the model resolution "2030 Agenda for Sustainable Development: Shaping Sustainability at the Municipal Level" of the German Association of Cities and Towns and the Council of European Municipalities and Regions/German Section • Sustainable City Dialogue – Mayors for Sustainable Development in Municipalities by the German Council for Sustainable Development (RNE) • Fairtrade Town • Declaration Climate Emergency – Climate Alliance (2019) • "Climate Active Municipality 2018" competition Award winner in the category Climate Adaptation in municipalities • #climate emergency at every town hall (2019)

Overview Climate Protection and Adaptation

In its resolution of February 14, 2019, the Cologne City Council commissioned the administration to implement the measures contained in the climate protection program "KölnKlimaAktiv 2022". As one component of the program, the so-called guidelines for climate protection in the implementation of non-urban new construction projects in Cologne are currently being developed. The "climate emergency" has increased the pressure on the city and

its administration to give higher priority to climate protection in all urban decisions and processes. The area of planning and building is an important lever here. The aim of the guidelines currently being prepared is to ensure that climate protection is taken into account at an early stage in the various procedures for implementing non-urban new construction projects in Cologne.

Only by taking this into account at an early stage is it possible to fully exploit the potential for climate protection, as subsequent adjustments are always associated with an increased time and financial outlay. It is about the implementation of climate protection aspects in qualification procedures, the binding urban land use planning (concerns exclusively the new development), the sale and heritable building rights of municipal land and the structural standard of residential and non-residential buildings. The guidelines are to follow a modular approach: In addition to reviewing and, if necessary, modifying the requirements and recommendations from this first module on the basis of the practical experience gained, the step-by-step model also envisages an expansion in terms of content in the future. Topics could be the inventory or the circular economy. The established close cooperation between the relevant departments is to be consolidated for this purpose.

Mobility overview

By 2025, respectively 2030, Cologne wants to ensure and increase the quality of life in the city with a two-thirds share of environmentally friendly transport in the total traffic volume. This goal was defined in the strategy paper "Cologne mobile 2025" published in 2014. A total of 17 courses of action are planned to achieve this guiding goal. Even though rehabilitation of the existing transport infrastructure is to have priority over its expansion, simultaneous further development of the infrastructure is sought in order to guarantee the efficiency of the growing city. In particular, expansion measures for bicycle traffic and local public transport are to be implemented in order to achieve the modal split targets. In addition, the aim is to intensify regional cooperation in order to tackle transport problems across territorial borders. Local public transport is thus to be further expanded in order to achieve a higher public transport share with the (supra-)regionally important project "Bahnknoten Köln" (Cologne rail hub) and the expansion of the urban rail network. Cologne hopes to increasingly pursue the approach of "Smart Mobility" and offer integrated mobility services "from a single source". Car and bike sharing, electromobility and active safety systems for cars are supported and promoted by the city's own companies. Further settlement development is to be closely coordinated with transport planning.

In order to operationalize and concretize the goals and fields of action, "Cologne mobile 2025" recommended that a transport development plan should be drawn up on the basis of the European SUMP guidelines. This mandate was given to the administration by the Cologne City Council in 2020. The "Sustainable Urban Mobility Plan" (SUMP) represents the update of the overall traffic concept (from 1992) and the further development of "Cologne Mobil 2025". In addition, the new city-wide urban development strategy "Cologne Perspectives 2030+" was published in September 2020. It defines goals for various areas of urban development – including mobility. Since a lot has changed in recent years, especially in the area of mobility, the SUMP will build on the principles of the "Cologne Perspectives 2030+" and the strategy paper "Cologne Mobile 2025", but will also update and deal with the defined goals and contents for the area of mobility in greater depth.

Overview Digitalisation

Back in 2010, the Cologne City Council commissioned the administration to present an overall concept for "Internet City Cologne". This was intended to effectively optimize the city's profile in the Internet sector and to "further develop Cologne as a national and international location for Internet technology and Internet infrastructure". Subsequently, the multi-stakeholder project "Internet City Cologne" was set up under the moderation of the city as a permanent and collaborative working forum of stakeholders from the Internet sector. The common goal is to de-

velop the city's positions on relevant Internet topics, projects in the area of open government, and innovative digital processes and products for the urban community.

The city of Cologne sees the "digital city" as a comprehensive cross-cutting issue for the entire city society; digital processes are to be established as universally as possible in all areas of the administration. In order to exploit the full potential of the new digital possibilities and thus position Cologne for the future, concrete, targeted programs with different focal points and addressees, for example on user-oriented services, on digital education and on networked services/Internet of Things, have been developed since 2018.

In the spirit of transparent city administration, the "Open Data" and "Open Government" approaches that have been successful in Cologne are being further expanded in order to open up structured knowledge of the administration even more and thus create transparency.

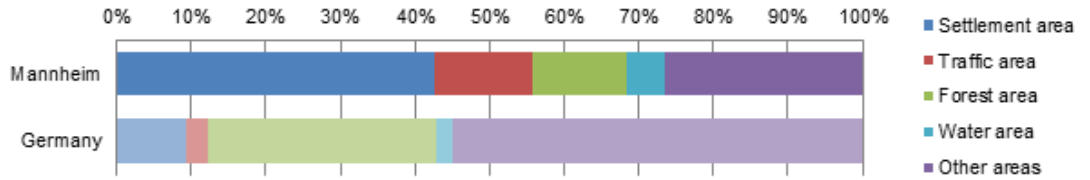
To support the process in the long term, a digital framework (digital frame work) with standards and principles for the digital transformation within the administration is also being further developed. This includes city-wide specifications for the use of central services such as a citizens' portal, end-to-end online appointment scheduling, a user-friendly and secure online payment process, uniform structures for e-files, the requirements assessment and procurement process, and even e-invoices. Another focus is on expanding the network infrastructure to provide a resilient broadband connection and a high-performance fiber-optic network as the foundation for all facets of digitization. This also includes the further development of the existing Cologne WLAN network and the identification of additional wireless technologies for municipal applications (e.g., 5G or LoRaWAN as technologies in the Internet of Things). The framework also regulates in particular the topics of data management and data exchange, geodata infrastructure and consideration of accessibility. It incorporates a city-wide project monitor, agile project management and further training concepts for employees in the interests of networked and transparent processes within the city.

The digital strategy takes into account interfaces with existing city strategies: as part of the administrative reform and the overall strategy Cologne Perspectives 2030, digitization was therefore recognized as a cross-cutting task for the topics of the entire city administration, which encompasses more than digital information offerings and the "electronification" of individual specialized procedures. The multi-stakeholder process ensures the overarching involvement of stakeholders in Cologne's urban society.

Mannheim

State	Baden-Württemberg
Population (as at: 31.12.2018)	309,370 inhabitants
Population density	2,134 inhabitants/km²
City foundation	1607 (first town privileges; 1652 establishment of the town constitution)
Special features	Historic inner city as a planned city, so-called "square city".

Total area Mannheim: 144.97 km²



Municipality type	Independent large city, growing
Central function	Regional centre
Employees of municipalities and municipal associations	21.5 per 1,000 inhabitants
Relevant awards	• Signatory municipality of the model resolution "2030 Agenda for Sustainable Development: Shaping Sustainability at the Municipal Level" of the German Association of Cities and Towns and the Council of European Municipalities and Regions/German Section • Fairtrade Town • DNP: German Sustainability Award Cities and Municipalities (Top 3 2019) • Declaration Climate Emergency – Climate Alliance (2019) • "Bicycle-friendly municipality"; member municipalities of the Working Group of Bicycle- and Pedestrian-friendly Municipalities in Baden-Württemberg e. V. (AGFK-BW)

Overview Climate Protection and Adaptation

Mannheim was one of the first German cities to submit a "Voluntary Local Review" on the implementation of the SDGs. Among other things, the city has set itself the goal of being climate neutral by 2050. The efforts for improved climate protection and climate-adapted urban planning and design are correspondingly broad: In October, for example, an urgent plan for mitigating the climate crisis was developed in the logic of the "climate emergency" and adopted by the municipal council. In the project "Mannheim on climate track", the citizens are also specifically involved – for example, various urban greening awards are offered that specifically increase the quality of life in the city in addition to climate and species protection functions. In addition, there are creative campaigns and projects in the field of sustainability communication and education for sustainable development, such as car-free weekends, joint marketing of climate protection-oriented businesses, especially in gastronomy and culture, a city-wide deposit cup system or a climate gourmet week.

Mobility overview

In addition to the above-mentioned measures, the goal of emission neutrality by 2050 also includes ambitious goals for the design of sustainable mobility. For example, there is the 21-point cycling concept, which, in addition to expanding the cycling infrastructure, also aims to improve the overall quality of road spaces to promote cycling and walking. Mannheim is also one of five model cities for the reduction of air pollution, especially nitrogen dioxide. With a subsidy of about 28 million, the public transport system is being expanded and the ticket price reduced by about one third. A comprehensive evaluation of this measure, especially with regard to the goal of improving the modal split, is still pending. However, automatic counting points suggest that the annual total of cars had decreased before the Corona pandemic began.

Overview Digitisation

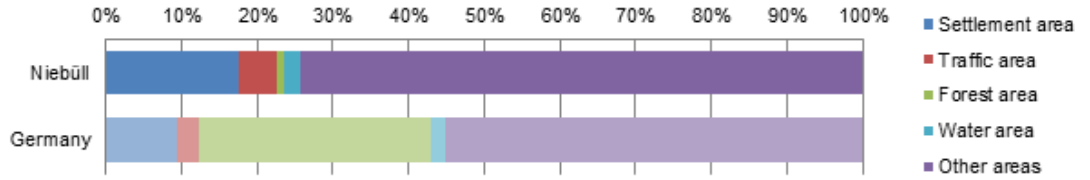
Overall, Mannheim's administration takes a pioneering role in Germany in the "Smart City Index" of the digital association Bitkom: For example, the city was awarded for the best e-government in 2019. In addition, the Ministry of the Interior has selected Mannheim as one of 12 cities for funding as part of the Smart City model project. Currently, the focus is also on the network connection of schools, the expansion of a "Long Range Wide Area Network" (LoRaWan), which enables the energy-efficient transmission of data over long distances, as well as the expansion of W-LAN hotspots in public spaces.

Niebüll

in the Südtondern administration of the county Nordfriesland (North Frisia)

State	Schleswig-Holstein
Population (as at: 31.12.2018)	10,086 inhabitants
Population density	323 inhabitants/km²
City foundation	1960 (granting of the town charter)
Special features	Health resort and administrative centre of the Südtondern administration (an association of 30 municipalities).

Total area Niebüll: 30.63 km²



Municipality type	Small town, growing
Central function	Sub-centre with partial functions of a medium-sized centre
Employees of municipalities and municipal associations	4 per 1,000 inhabitants at Amt Südtondern
Relevant awards	• Signatory municipality of the model resolution "2030 Agenda for Sustainable Development: Shaping Sustainability at the Municipal Level" of the German Association of Cities and Towns and the Council of European Municipalities and Regions/German Section • Fairtrade Town • Membership Municipal Working Group for the Promotion of Walking and Cycling in Schleswig-Holstein e.V. (RAD.SH) • Award-winning partner of the Schleswig-Holstein Wadden Sea National Park

Overview Climate Protection and Adaptation

Niebüll has a natural interest in climate change issues simply because of its special geographical location near the North Sea, about three metres above sea level – situated in the middle of marshland and in the Wadden Sea National Park. It is not without reason that various measures have already been implemented in the area of climate protection and climate adaptation. These include – in addition to the creation of a climate protection concept, the hiring of a climate protection manager at county level and the conversion of street lighting to LED lighting technology – the signing of a declaration against oil drilling, a national park partnership and various initiatives to reduce plastic waste, which the city realises together with local partners. Furthermore, Stadtwerke Niebüll ensures general access to affordable, reliable and modern energy services with a focus on renewable energy and energy efficiency. This includes, among other things, a district/ local heating concept through biomass, to which many public, but also private buildings are connected. Stadtwerke Niebüll also offers drivers of electric cars a favourable mobile electricity tariff, which is also valid at all of the more than 2,100 public charging points in Germany. At the county level (Kreis Nordfriesland), a climate protection management was newly set up, which can serve not least to further initiate integrated policies and plans to promote resource efficiency, mitigation of climate change and climate adaptation also in Niebüll. To this end, it was unanimously decided to promote and develop a broad North Frisian climate alliance. The North Frisia Climate Alliance will create a regional platform for joint climate protection-related action in the county.

Mobility overview

The main objectives in Niebüll in the field of mobility, include promoting walking and cycling, in order to make the city safer, to promote the mental health and well-being of Niebüll residents and visitors to the city, to reduce the number of traffic accidents, and the number of illnesses due to pollution and contamination of air, water and soil. In order to become a pedestrian and bicycle friendly city by 2023, short routes and clear traffic axes are to be created in the city. Special attention will be paid to local supply, recreation, tourism and school routes. In addition, the expansion and new construction of sidewalks and cycle paths, the installation of bicycle priority lanes, the expansion of the existing bicycle parking facilities at the railway station, improvements in cycling guidance, but also speed reductions for motorised traffic, such as the expansion of 30 km/h zones, as well as the safe design of school routes and their announcement to parents and pupils will be promoted. Niebüll has also been a member of "RAD.SH – Kommunale Arbeitsgemeinschaft zur Radverkehrsförderung in Schleswig-Holstein," (municipal work group for the promotion of bicycle transport) since 2017. Thereby, Niebüll wants to continuously improve and expand the range of services for cyclists and pedestrians in the sense of the mobility transition.

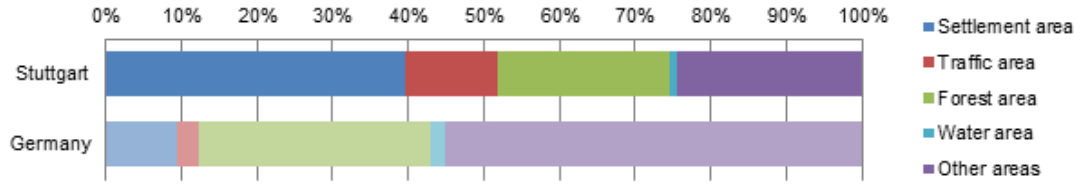
Overview Digitisation

The city of Niebüll, together with other municipalities and shareholders, supports productive activities, the creation of decent jobs, entrepreneurship, creativity and innovation by securing North Friesland as a business location and safeguarding jobs through the expansion of fibre optics. In 2010, Breitbandnetz GmbH & Co KG was founded for this purpose, with the aim of installing and operating an area-wide fibre optic network with around 24,000 connections in the approximately 50 municipalities of Mittleres Nordfriesland, Südtondern and the municipality of Reußenköge. The shareholders are mainly entrepreneurs from the renewable energy sector, municipalities and some private investors. The broadband network company has an investment volume of about 60 million euros and is building one of the most modern and powerful fibre-optic networks in Germany. The plan is to connect all the towns in the Mittleres Nordfriesland and Südtondern administrations as well as the municipality of Reußenköge to the network. Every citizen, no matter how remotely he or she may live, will have the fibre optic cable laid to his or her house free of charge, if he or she so wishes. In addition, Niebüll is planning to connect to the statewide #SH_WLAN network, which will enable free wi-fi in the public, extended city center area.

State capital Stuttgart

State	Baden-Württemberg
Population (as at: 31.12.2018)	634,830 inhabitants
Population density	3,062 inhabitants/km²
City foundation	926 – 948
Special features	Capital of Baden-Württemberg, important business location

Total area Stuttgart: 207.33 km²



Municipality type	Independent large city, growing
Central function	Regional centre
Employees of municipalities and municipal associations	28 per 1,000 inhabitants
Relevant awards	• Signatory municipality of the model resolution "2030 Agenda for Sustainable Development: Shaping Sustainability at the Municipal Level" of the German Association of Cities and Towns and the Council of European Municipalities and Regions/German Section • Fairtrade Town • Special mention for fair trade impact monitoring in the 2021 EU Fair and Ethical Trade City Award • German Sustainability Award for Cities and Municipalities (Top 3 2020 and 2019, Finalist 2021) • "Bicycle-friendly municipality"; member municipalities of the Working Group of Bicycle- and Pedestrian-friendly Municipalities in Baden-Württemberg e. V. (AGFK-BW)

Overview Climate Protection and Adaptation

The state capital Stuttgart is very well positioned in the area of climate protection, which is due to long-standing activities – Stuttgart has been a member of the Climate Alliance of European Cities since 1995, for example. Various projects and measures attest to the use and expansion of renewable energies as well as in climate-friendly procurement; there are funding programmes, networking systems, educational projects and measures for improved internal management. A clear distinction is made between the strategic, integrative work in staff units and the operational work in various sectoral offices. There are also diverse activities in climate adaptation. For

example, the Stuttgart climate change adaptation concept KLIMAKS, which was already adopted by the city council in 2012, includes more than 50 measures in all areas of adaptation and has a special focus on the urban climatic-air-hygienic situation in the city area. In 2019, the action programme "World climate in need – Stuttgart acts" was also developed, in which a climate protection fund was formed from 2018 budget surpluses and thus around 200 million euros could be additionally invested in climate protection and adaptation projects. Furthermore, the state capital has been regularly balancing its GHG emissions since 1990 – most recently even annually.

Mobility overview

In response to the generally known problems of traffic congestion and environmental pollution in Kesselstadt, the city adopted the Traffic Development Concept 2030 back in 2013. The focus here is on upgrading public spaces – in conjunction with the planning principle of "inner development before outer development – and the guiding principle of a city of short distances. The concept was supplemented by the dynamic element of the "Sustainable mobility action plan", which describes various measures in nine fields of action. A steering committee chaired by the Lord Mayor ensures the implementation of the measures. In the implementation of the measures, a well-functioning cooperation between different actors at different levels has been established. The plan is regularly updated. The choice of environmentally friendly modes of transport is continuously increasing.

Overview Digitisation

The digitization strategy "Digital MoveS: Stuttgart.Gestaltet.Zukunft" aims to provide citizens with customer-oriented and efficient administrative processes that are fully digitized on the basis of modern and secure IT infrastructure. The focus is on the triad "people – process – IT", in connection with which the expansion of online services and mobile working is taking place, the digitization of processes and specialized procedures or the further development of the IT infrastructure and broadband expansion. Under the umbrella of this strategy, the offices are currently working with their digital movers to develop supplementary digitization strategies. Digital MoveS focuses on digital city administration, which is the basis for a "smart" city. There are also other digital projects in the areas of mobility, climate and energy, society, IT infrastructure and urban planning. In the 2019 and 2020 Smart City Rankings of the BITKOM association, Stuttgart was among the top 10 municipalities in each case, and in the area of mobility, Stuttgart even took first place in 2019.

Workshop programme partner municipalities

Title

Workshops to advise selected partner municipalities on the implementation and monitoring of the New Urban Agenda goals.

Objectives

The overarching goal is to make the preparation of the national progress report on the implementation of the New Urban Agenda for the United Nations more goal-oriented, to better reflect city-specific characteristics in data collection, data preparation and data provision, and to establish the compatibility of local data with regionalised and national data, as well as to eliminate data-related ambiguities.

Questions:

- What experiences have you had in the process of implementing sustainability measures in the above-mentioned thematic fields in your city?
- How has progress in sustainability been measured?
- Which indicators were used for this?
- What data is available?
- What challenges arise in the survey? What are alternative indicators?

Participants

from Sustainability Management; Climate Protection Management; Departments of Strategic Management, Sustainable Urban Development, Environment; Administrative Coordination; Mayors, Difu Scientists

Programme proposal

10:30 a.m.	Impulse (Difu) *Welcome & presentation of the project, the New Urban Agenda and links to the municipality*
10:45 a.m.	Discussion / input (municipality): City-specific features in the implementation of sustainability measures and monitoring *What goals does the municipality have in connection with the SDGs / the New Urban Agenda? Which measures have already been implemented? What measures are planned for the future? Will smart technologies / big data approaches be used? Does the municipality have an open data strategy? What other city-specific features / framework conditions exist today / in the future?*
11:15 a.m.	Discussion of the compatibility of local data with regionalised, national and international data and data-related ambiguities *What synergies / conflicts exist with higher-level data? Where are the biggest challenges in monitoring the SDGs / New Urban Agenda goals?*
12:00	Lunch Break
12:45 p.m.	Impulse (Difu) *Presentation of the main topics of the New Urban Agenda monitoring, comparison of New Urban Agenda / Agenda 2030 indicators, target congruencies/conflicts*
01:00 p.m.	Discussion of the focus topics & individual indicators *Discussion on the feasibility of the indicators in the thematic fields* *"Climate protection,* *"Mobility in the context of towns and cities and their surrounding",* *"Digitalisation"*
03:00 p.m.	Coffee break
03:15 p.m.	Gap Analysis: Qualitative Responses to Gaps in the Indicator Set *Which fields of action / projects are not covered by the indicators? What does the municipality want? Change in the framework conditions? Survey aids?*
04:00 p.m.	Summary and outlook
04:30 p.m.	Workshop conclusion

National Progress Report
on the implementation of the New Urban Agenda

Appendix II

Indicator sets used

Climate protection and climate adaptation

Description of the indicator		Primary assignment to the New Urban Agenda Paragraph ↓	Primary assignment to the SDGs Target / subtarget
Name of the indicator	**Definition or calculation of the indicator**		
Final energy productivity	(gross domestic product) / (primary energy consumption)	44	7.3
Energy-efficient street lighting	(number of street lights with LED technology) / (number of street lights) * 100	54	7.3
Share of renewable energies in gross final energy consumption	(energy supply from renewable energies) / (gross final energy consumption) * 100	54	7.2
Share of electricity from renewable energy sources in gross electricity consumption	(electricity supply from renewable energies) / (gross electricity consumption) * 100	54	7.2
Power from Wind power	(Installed wind energy capacity) / (number of inhabitants)	54	7.2
Power from Photovoltaics	(Installed photovoltaic capacity) / (number of inhabitants)	54	7.2
EMAS-certified sites	(EMAS-certified sites) / (number of sites) * 1,000	58	12.6
Locations with environmental or sustainability certificates	(Number of sites with EMAS certificate, ISO 14001 certificate, ISO 50001 certificate, DNK declaration, Ökoprofit certificate, GRI balance sheet or common good balance sheet) / (Number of sites) * 1,000	63	12.6
Retention areas	(Average retention volume) / (area)	64	13.1
Ecological forest conversion	(Ecologically converted forest area) / (forest area) * 100	67	13.1
Trees in public space	(number of trees in public space) / (total area of public space)	67	13.1
Recycling rate	(Amount of recycled waste) / (Total amount of waste) * 100	71	12.5
Forest area	(Forest area) / (Total area) * 100	71	15.2.2
Greenhouse gas emissions – Private households	(greenhouse gas emissions of private households in t CO_2-eq) / (number of inhabitants)	79	13.2

Description of the indicator		Primary assignment to the New Urban Agenda	Primary assignment to the SDGs
Name of the indicator	Definition or calculation of the indicator	Paragraph ↓	Target / subtarget
Greenhouse gas emissions – industry and manufacturing	(Greenhouse gas emissions from industry and manufacturing in t CO_2-eq) / (number of inhabitants)	79	13.2
Greenhouse gas emissions – trade, commerce, services (GHD) and other	(Greenhouse gas emissions from trade, commerce, services (GHD) and other in t CO_2-eq) / (number of inhabitants)	79	13.2
Greenhouse gas emissions – Municipal facilities	(Greenhouse gas emissions from municipal facilities in t CO_2-eq) / (number of inhabitants)	79	13.2
Greenhouse gas emissions – motorised private transport (MIV)	(Greenhouse gas emissions of motorised private transport in g CO_2-eq) / (passenger kilometres)	79	13.2
Greenhouse gas emissions – public transport	(Greenhouse gas emissions of public transport in g CO_2-eq) CO_2-eq) / (passenger kilometres)	79	13.2
Greenhouse gas emissions – road freight transport	(Greenhouse gas emissions from road freight transport in t CO_2-eq) / (Gross domestic product)	79	13.2
Personnel in municipal climate protection	(full-time equivalents) / (number of inhabitants) * 1,000	80	13.3
Index "Municipal Climate Protection"	Sum index of dichotomous variables (see Annex 6.4)	80	13.2
Index "Municipal Climate Adaptation"	Sum index of dichotomous variables (see Annex 6.4)	80	13.1
Municipal expenditure for the expansion of renewable energies	(Investment and promotion expenditure for the expansion of renewable energies) / (Municipal expenditure) * 100	121	7.a
Completed residential buildings with renewable heating energy	(Number of newly constructed residential buildings with renewable heating energy) / (Number of newly constructed residential buildings) * 100	121	11.b
Rate of energy refurbishment of buildings	Rate of energy refurbishment of buildings	121	11.b
Energy consumption – Private households	(Direct and indirect energy consumption of private households) / (number of inhabitants)	121	12.2
Energy consumption – Industry, trade, commerce and services	(Direct and indirect energy consumption of industry, trade, commerce and services) / (number of employees subject to social security contributions)	121	12.2

Mobility in the urban-rural context

Description of the indicator		Primary assignment to the New Urban Agenda Paragraph ↓	Primary assignment to the SDGs Target / subtarget
Name of the indicator	**Definition or calculation of the indicator**		
Public transport – accessibility of bus stops	(Number of accessible stops) / (Total number of stops) * 100	34	11.2
Mobility in an urban-rural context" index	Sum index of dichotomous variables (see Annex 6.4)	50	11.2
Noise pollution	(number of inhabitants in residential areas exposed to traffic noise) / (number of inhabitants) * 100	54	3.4
Immission of air pollutants	Immission of air pollutants (nitrogen dioxide, particulate matter (PM_{10}), ozone)	54	3.9
Basic care close to home – family doctor	Population-weighted linear distance to the nearest GP	70	3.8
Basic services close to home – Pharmacy	Population-weighted linear distance to the nearest pharmacy	70	3.8
Basic services close to home – Primary school	Population-weighted linear distance to the nearest primary school	70	4.1
Basic services close to home – supermarket	Population-weighted linear distance to the nearest supermarket or discount store	70	11.1
Traffic accident victims	(Number of persons injured or killed in road accidents) / (Number of inhabitants) * 1,000	113	11.2
Modal split	(volume of walking, cycling and public transport) / (volume of traffic) * 100	114	11.2
Car density	(number of passenger cars) / (number of inhabitants) * 1,000	114	11.2
Car-Sharing offers	(CarSharing vehicles) / (number of inhabitants) * 1,000	114	11.2
Passengers by mode of transport	Passengers in road passenger transport, rail transport, air transport, motorised private transport (MIV) in pkm	114	9.1
Cycle path network	(length of the dedicated cycle path network) / (number of inhabitants) * 1,000	114 a	11.2
Public transport – local supply with bus stops	(Number of inhabitants with a maximum linear distance of 1,000 m to the nearest public transport stop with at least 10 departures per day) / (Number of inhabitants) * 100	114 a	11.2
Public bicycle rental system	(number of bicycles in a public rental system) / (number of inhabitants)	114 a	11.2

Description of the indicator		Primary assignment to the New Urban Agenda	Primary assignment to the SDGs
Name of the indicator	**Definition or calculation of the indicator**	**Paragraph ↓**	**Target / subtarget**
Public transport – accessibility of medium/regional centres	Population-weighted average travel time by public transport from each stop to the nearest medium/regional centre in min	114 c	11.2
Freight transport by rail and inland waterways	Freight transport expenditure in mill tkm	114 d	9.1
Freight volume by mode of transport	Freight volumes in rail transport, inland waterways, air transport, road transport, pipelines: Crude oil, in tkm	114 d	9.1
Stock of passenger cars with electric drive	(Number of privately registered passenger cars with electric drive (including plug-in hybrids)) / (Number of privately registered passenger cars) * 10,000	118	11.2
Final energy consumption in transport	Final energy consumption in freight and passenger transport	121	11.2
Final energy consumption of transport per inhabitant	Final energy consumption of transport per inhabitant	121	11.2

Digitisation

Description of the indicator		Primary assignment to the New Urban Agenda Paragraph ↓	Primary assignment to the SDGs Target / subtarget
Name of the indicator	**Definition or calculation of the indicator**		
Broadband supply – private households	(Number of households with broadband coverage (≥ 50 Mbit/s)) / (Number of households) * 100	34	9.c
Broadband supply – Business	(Number of businesses with broadband coverage (≥ 50 Mbit/s)) / (Number of businesses) * 100	34	9.c
IT equipment in schools	Number of computers (desktop PCs, notebooks, tablets) per pupil (all school types)	34	4.a
Broadband supply to schools	Broadband coverage of schools (broadband coverage of schools across all technologies; in % of schools ≥ 50 Mbit/s)	34	4.a
Internet usage of the population	Proportion of the population using the internet (%)	34	9.c
Access to public wifi	Proportionate availability of public W-Lan	34	9.c
Population covered by the mobile network	Share of households covered by UMTS in %, share of households covered by LTE	50	9.c
Digital Municipality Index	Sum index of dichotomous variables (see Annex 6.4)	66	16.6
Electronic waste	Generated e-waste (kg / inhabitant)	74	12.5
Municipal online services	(Number of municipal services that can be carried out online) / (Total number of municipal services) * 100	156	16.6
Open Data	Number of open records of the administration	160	16.6
Digital participation	Number of platforms for digital citizen participation	160	16.6

Questionnaires Index Indicators

Index "Municipal Climate Adaptation"

#	Questions	Yes	No	See comment
1	Have a climate analysis and climate hazard map been prepared for your municipality? *Comment if applicable*			
2	Is there a political decision on climate adaptation? *Comment if applicable*			
3	Is there a concept that deals with the impacts of climate change in the municipality, considers the specific municipal impacts and threats and develops a local strategy with suitable adaptation measures (climate adaptation concept)? *Comment if applicable*			
4	Has this climate adaptation concept been adopted? *Comment if applicable*			
5	Does adaptation to the consequences of climate change (protection against flooding, heat, drought, storm damage, etc.) receive attention in urban planning and development? *Comment if applicable*			
6	Have measures for adapting to the consequences of climate change already been implemented in public projects / buildings / areas (e.g. green roofs and facades, unsealing and greening measures on squares, retention areas and much more)? *Comment if applicable*			
7	Is there an interdisciplinary/interdepartmental "climate adaptation" working group in your municipality? *Comment if applicable*			
8	Is there a municipal heat action plan or similar instrument for heat prevention? *Comment if applicable*			
9	Have measure been taken to raise awareness and inform citizens about climate change and adaptation? *Comment if applicable*			
10	Are there municipal support programmes for private climate adaptation measures and self-provisioning for actors in urban society? *Comment if applicable*			
	Total			

Index "Municipal Climate Protection"

#	Questions	Yes	No	See Comment
1	Is there a political decision on municipal climate protection targets in your municipality? *Comment if applicable*			
2	Has a climate protection concept been prepared in your municipality? *Comment if applicable*			
3	Does your municipality have staff explicitly responsible for climate protection? *Comment if applicable*			
4	Has a greenhouse gas/CO_2 balance been drawn up and updated at least once? *Comment if applicable*			
5	Is there regular or institutionalised interdepartmental cooperation within the local government on climate protection? *Comment if applicable*			
6	Is there staff exclusively responsible for energy management? *Comment if applicable*			
7	Does your municipality have a cycling or walking officer? *Comment if applicable*			
8	Are renewable energies used on municipal properties? *Comment if applicable*			
9	Has a systematic investigation been carried out in your municipality as to which of the municipal buildings could be considered for the use of (certain) renewable energies? *Comment if applicable*			
10	Is there a systematic study for the use of (certain) renewable energies for your entire municipality or region (beyond municipal properties)? *Comment if applicable*			
11	Are there specific targets for the use of renewable energies in your own properties? *Comment if applicable*			

#	Questions	Yes	No	See Comment
12	Are there specific expansion targets for renewable energies for the entire municipality? *Comment if applicable*			
13	Is climate-friendly procurement the rule in your municipality? *Comment if applicable*			
14	Does your municipality use existing land-use planning, urban planning or other regulatory competences to obtain regulations or stipulations in the sense of climate protection? *Comment if applicable*			
15	Are the municipality's offers for sensitising and informing citizens about climate protection and renewable energies available? *Comment if applicable*			
16	Are there one or more currently running municipal support programmes for climate protection / energy for actors in the local community? *Comment if applicable*			
17	Is your municipality a member of the Climate Alliance, the European Energy Award, the "Covenant of Mayors for Climate & Energy", a comparable association or is it a "dena Energy Efficiency Municipality"? (dena: German Energy Agency) *Comment if applicable*			
18	Has your municipality received a climate protection award in the last 10 years? *Comment if applicable*			
19	Does your municipality have an international municipal climate partnership? *Comment if applicable*			
	Total			

Index “Mobility in an urban-rural context"

#	Questions	Yes	No	See Comment
1	Is there a joint transport development plan (VEP) or similar of the local authorities in the urban-rural interlinkage area? *Comment if applicable*			
2	Is there a joint local transport plan (NVP) of the public transport authority organisations in the urban-rural interlinked area? *Comment if applicable*			
3	Is there a social ticket that is valid in the city-surrounding area? *Comment if applicable*			
4	Do you combine push and pull measures in your municipal transport policy? (In other words, do you rely solely on improvements in public transport services as a pull measure in order to achieve a modal shift towards environmental transport?) *Comment if applicable*			
5	Is there a settlement development strategy coordinated with the municipalities in the surrounding area that is aligned with the axes of the rail-bound public transport system (suburban railway, regional railway, light rail)? *Comment if applicable*			
6	Do you pursue a coordinated strategy for the development of cycling together with the municipalities in the surrounding area? (e.g. an inter-municipal network of so-called cycling fast links / routes) *Comment if applicable*			
7	Do urban and suburban municipalities have a pedestrian strategy that improves the accessibility of railway stations and bus stops on foot? (e.g. creation of shortcuts, traffic lights, defusing areas of fear). *Comment if applicable*			
8	Is there an app that provides information about travel options with different mobility services and allows booking / payment? *Comment if applicable*			
9	Are there any rail transport projects with regard to urban-rural linkages that are currently being implemented or are scheduled to start within the next five years? *Comment if applicable*			
10	Are there any projects in bus transport with regard to urban-rural linkages that are currently being implemented or are to be started within a year? *Comment if applicable*			

#	Questions	Yes	No	See Comment
11	Are new mobility services being implemented in the urban-suburban area or are there concrete plans for this? (meaning in particular car and bike sharing services that are also offered in surrounding communities) *Comment if applicable*			
12	Are mobility concepts implemented in new housing construction in the core city and in surrounding communities so that tenants are offered an alternative to private cars? *Comment if applicable*			
13	Is there a coordinated strategy for the implementation of charging infrastructure in the core city and in the surrounding municipalities, so that the switch to an electrically powered vehicle is facilitated? *Comment if applicable*			
14	Are there concepts for commercial transport such as a master plan? *Comment if applicable*			
15	Will city logistics be implemented? *Comment if applicable*			
	Total			

Index “Digital City”

#	Questions	Yes	No	See Comment
1	Does the municipality have a digital agenda / digital strategy? *Comment if applicable*			
2	Is the digital agenda / digital strategy fundamentally aimed at sustainable urban development and does it include individual strategic fields of action for this purpose? (e.g. higher efficiency of administration, more transparency and participation, achievement of concrete climate targets, optimised mobility and traffic flows, regional innovation and business promotion). *Comment if applicable*			
3	Does the municipality have a permanent working group / staff unit / competence centre as a steering unit that deals with the topics of digitalisation and smart city? *Comment if applicable*			
4	Are the effects and the achievement of the goals of the digital agenda / digital strategy checked by long-term monitoring? *Comment if applicable*			
5	Do municipalities or municipal enterprises have sovereignty over the data that are relevant for the fulfilment of their tasks? *Comment if applicable*			
6	Does the municipality have a long-term strategy for dealing with big data? (Data protection and security) *Comment if applicable*			
7	Does the municipality publish its data as Open Data? *Comment if applicable*			
8	Does the digital agenda / digital strategy follow an inclusive and enabling approach that ensures the participation of all citizens and does not exclude individual groups? (e.g. continue to provide all municipal services in analogue form). *Comment if applicable*			
9	Are there target group-specific education and support services for dealing with information and communication technologies or media literacy on site? *Comment if applicable*			
10	Does the municipality support the provision and access to equipment and software? *Comment if applicable*			
11	Are digital platforms used in the municipality to make local information that is important for democratic decision-making more available? *Comment if applicable*			

#	Questions	Yes	No	See Comment
12	Are there collaborations with business and science in the field of digitalisation to support innovation and development locally? *Comment if applicable*			
13	Does the digital agenda take into account improving the location and securing local knowledge and value creation? *Comment if applicable*			
14	Are digital technologies used in the municipality to support the local energy transition on site? (e.g. smart grids, smart metering, smart lighting) *Comment if applicable*			
15	Does the digital agenda / digital strategy include local sharing approaches and sustainable business models that promote a more resource-efficient economy or circular economy? *Comment if applicable*			
16	Does the digital agenda / digital strategy take into account possible spatial effects, such as land consumption and conversion potentials or transport requirements? *Comment if applicable*			
	Total			

Overview of sustainability strategies of the federal states

State	Strategy (name)	Publisher (responsible department)	Publication (year)	Further development / update (year)	Indicators (number)	Focal points / special features
Baden-Württemberg	Sustainability Strategy "Acting Sustainably	Ministry for the Environment, Climate and Energy Management Baden-Württemberg	2007	2011, 2014	47 objective indicators, 6 subjective indicators	Focus areas: Energy and climate, resources, education for sustainable development, sustainable, sustainable mobility SDG integration since 2016 with regular indicator reports (most recent 2019).
Bavaria	Sustainability Strategy "For a Sustainable Bavaria	State Ministry for the Environment and Consumer Protection	2013	2017	27	Intergenerational justice in 11 fields of action: Climate change, sustainable energy, conservation and management of natural resources, sustainable mobility, social cohesion, education and research, sustainable economy and consumption, health and nutrition, state and administration, sustainable financial policy, global responsibility and networking.
Berlin	Sustainability profile	Senate Department for the Environment, Transport and Climate Protection	2012	2014, 2016	not reported	Focal points: Sustainability in urban development, environmental justice and the linking of economic, social and ecological goals – taking into account global trends and the compatibility as well as implementation with/of sustainability issues.
Brandenburg	State Sustainability Strategy (LHS)	Ministry of Agriculture, Environment and Climate Protection, Department of Environment, Climate Protection, Sustainability	2014	2017, 2019	49	Securing Brandenburg's development potential – taking into account global trends and sustainability principles; anchoring the idea of sustainability in politics, the economy and society; promoting the participation of local actors
Bremen	Mission statement	The Senator for the Environment, Construction and Transport (SUBV)	/	/	Not available	Focal points: Climate-friendly urban design, creating an economic, ecological and social balance

State	Strategy (name)	Publisher (responsible department)	Publication (year)	Further development / update (year)	Indicators (number)	Focal points / special features
Hamburg	Implementation of the 2030 Agenda in Hamburg	Authority for Environment and Energy, Presidential Department	2017	/	Application Country Initiative Core Indicators (LIKI)	4 cluster themes: Environment and the City, Participation and Social Cohesion, Sustainable Economic and Financial Policy, Education and Science
Hesse	Learning and acting for our future	Hessian Ministry for the Environment, Climate Protection, Agriculture and Consumer Protection Wiesbaden; Since 2019: Decision-making body: Hessian Alliance for Sustainability (HBN)	2008	2014, 2015, 2016	40	Focal points since 2019: Mission statement and business initiatives as well as the overarching promotion of visibility and awareness of sustainability
Mecklenburg-Western Pomerania	/	/	/	/	/	Development of a strategy in coordination with the national sustainability strategy of the Confederation by 2021
Lower Saxony	Sustainability Strategy for Lower Saxony	Lower Saxony Ministry for the Environment, Energy, Building and Climate Protection	2017 (2008 "Environmentally Just Prosperity for Generations)	2016, 2020	60	26 fields of action in the areas of: economic performance, social cohesion and protection of natural resources
North Rhine-Westphalia	Sustainability Strategy NRW	Ministry of the Environment, Agriculture, Nature Conservation and Consumer Protection of North Rhine-Westphalia (MULNV)	2016	2018	70	NRW is the first federal state to address all SDGs and understands sustainable development as a combination of social justice and economic reason with ecological responsibility.
Rhineland-Palatinate	Sustainability strategy	Ministry of Economy, Transport, Agriculture and Viticulture	2005	2007, 2011, 2015	not reported	

State	Strategy (name)	Publisher (responsible department)	Publication (year)	Further development / update (year)	Indicators (number)	Focal points / special features
Saarland	"Taking responsibility together – for today and tomorrow".	Ministry for the Environment and Consumer Protection	2016	/	39 (Application Country Initiative Core Indicators LIKI)	Priorities: Education, knowledge and innovation, financial sustainability, demography, sustainable settlement development, climate and resource protection, preservation and strengthening of the business and industrial location, mobility.
Saxony	Sustainability strategy	Saxon State Ministry for the Environment and Agriculture	2013	2018	31	9 fields of action: Education and science, public finances, energy and climate, natural livelihoods and resource conservation, cities and rural areas, economy, innovation and skilled workers, health and quality of life, cultural diversity, social cohesion and equal opportunities, international relations and development cooperation.
Saxony-Anhalt	Together for a future worth living – Sustainability Strategy of the State of Saxony-Anhalt	Ministry of Agriculture and Environment (MLU)	2014	2016	not reported	Priorities: Demographic change, fiscal policy, regional planning and land development, urban development, rural development, education and science, health, transport policy, agriculture and forestry
Schleswig-Holstein	Land development strategy	Ministry for Energy Transition, Agriculture, Environment, Nature and Digitalisation (MELUND)	2016	/	not reported	Priorities: Quality of Life, Education, Innovation and Research, Economy, Natural Resources, Digitalisation, Modern State and Society
Thuringia	Thuringian Sustainability Strategy	Thuringian Ministry for the Environment, Energy and Nature Conservation	2011	2018, 2019, 2020	33	Priorities: Education and Lifelong Learning, Climate, Energy and Sustainable Mobility, Sustainable Consumption and Management, Biodiversity Protection, Reducing Inequalities