

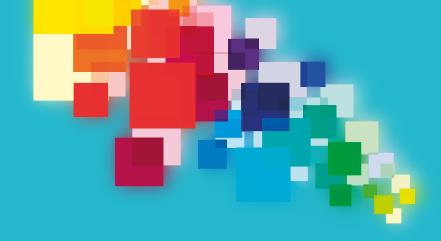
WORK PROGRAM 2020/21

MORGENSTADT INNOVATION NETWORK



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Morgenstadt Innovation Network



THE FRAUNHOFER MORGENSTADT INITIATIVE

The Morgenstadt Initiative is an innovation program of the Fraunhofer-Gesellschaft that aims to think ahead, develop and test innovations for the city of tomorrow. The Morgenstadt Initiative is based on the conviction that the key to the great challenges of our time lies in the transformation of our cities. It is therefore our declared goal to identify solutions and transformation paths for CO_2 neutral, livable and resilient cities as well as to implement them in an exemplary manner with the help of social, technical and organizational innovations. **System innovations are the key to a sustainable city** – and we can only achieve these through close and transdisciplinary cooperation between all the players involved. The Morgenstadt Initiative is therefore organized as a network between Fraunhofer Institutes, cities, municipal companies and private companies.

Through the collaboration of currently 11 Fraunhofer Institutes, the Morgenstadt Initiative pursues a systemic approach. This means that we transfer the **thematic sectors of urban development** (mobility, energy, water, information and communication technologies, building, governance, food production and logistics) into innovation fields in order to **take into account their interfaces and interdependencies**. On this basis, the Morgenstadt Initiative focuses on 11 innovation fields that are relevant across themes on the one hand and bring together different sectors on the other.

At the same time, the interactions between technologies, infrastructures, users, urban space, city administration, politics, local economy and business models are diverse and complex. We will therefore only succeed in transforming our cities in a sustainable manner if these interrelationships are shaped actively and in a transdisciplinary way. The **systemic approach** of the Morgenstadt Initiative **identifies innovation potentials** and **transfers them into new solutions, strategies and governance models**, which are tested in collaboration with the partners. Thus, on the one hand, new markets and development potentials in urban systems for existing products, technologies and system solutions can illustrated and quantified (evolutionary innovation), and on the other hand, upcoming technological leaps and disruptive developments for the city of tomorrow can be identified and new product systems and business models can be designed for them (revolutionary innovation).



The Morgenstadt Initiative was initiated in 2011 in collaboration of 10 Fraunhofer institutes headed by the Fraunhofer IAO. Since then, 35 cities, 42 companies and 13 Fraunhofer Institutes have jointly developed ideas, tested solutions and launched new projects. The total volume of the projects launched by Morgenstadt amounts to 500+ million euros – and well over 100 cities worldwide are currently working on projects and solutions that have emerged from the Morgenstadt Initiative. The first phase (2012–2013) was dedicated to analysis with the creation of the **Morgenstadt Framework** as a new type of analysis and transformation model for the city of the future. The first **joint pilot projects** were then started from 2014 onwards and intelligent, clean and interconnected technologies were piloted in partner cities in Europe. The Morgenstadt Framework, for example, was tested and refined in the first **City Labs** in Prague, Lisbon, Chemnitz and Tbilisi. Since 2017, Morgenstadt has been devoting itself increasingly to **systemic market issues**. In this context, the Fraunhofer-Gesellschaft has initiated the BABLE UG. In addition, with the "Urban Development Initiative" (UDI) in Eindhoven, the first regional innovation partnership, was established.

WORK PROGRAM 2020/21

With its work program 2020/21, the Morgenstadt Initiative aims to set the course for the market ramp-up of clean and interconnected urban solutions in Germany and worldwide as well as showing ways in which these can be brought to fruition from individual pilot projects. In doing so, we are placing a clear focus on solutions and processes that actively support the two priority goals of climate protection and climate adaptation of local communities. On the one hand, we concentrate **on concrete urban solutions** that result from the interaction of technology, infrastructure and users. On the other hand, we create – together with our partners from municipalities and business – **systemic preconditions** for the successful implementation and operation of sustainable urban technologies.

COLLABORATIVE R&D

In collaborative innovation partnerships, current research topics from Morgenstadt are worked on in smaller groups and concrete options for action and pilot projects are defined.

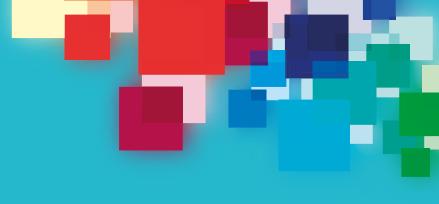
MARKET DESIGN

Together with partners from politics, business, research and society, the Morgenstadt Initiative is driving forward concrete projects to shape the market. Topics on the agenda include a data competence center, novel investment vehicles and solution certificates for Smart City products and components. One of the goals is to create functioning organizations with a lasting presence in the newly established market for the city of the future.

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The **link between applied research and strategic business development** is the key to achieving this goal. For this reason, the 2020/21 work program focuses on a balanced mix of technological innovation and the creation of conditions for disseminating sustainable urban development. The Morgenstadt Initiative is based on network management. From 2020 onwards, it will also build on the following three pillars:

- Market Design
- Collaborative Research and Development (R&D)
- Global Scalability and International Knowledge and Technology Transfer

The Work Program outlines goals to be implemented by 2021.

Network Management

The three pillars are embedded in the network management, which in addition to knowledge management also coordinates the Morgenstadt Steering Board and organizes three Morgenstadt meetings/conferences a year. Figure 2: The Three Pillars of the Morgenstadt Work Program 2020/21.

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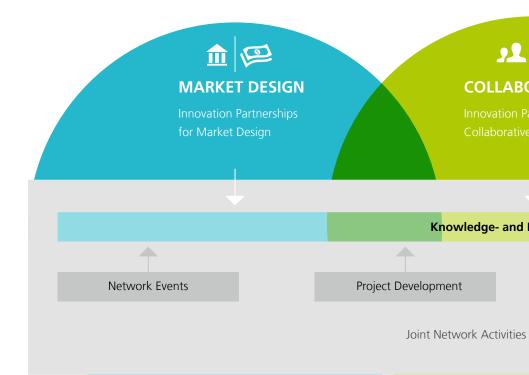
GLOBAL SCALABILITY

The central analytical instrument of the Morgenstadt Initiative is the Morgenstadt Framework and the associated City Lab. In cooperation with international partners, global scalability aims to establish the City Lab as an international standard for urban transformation strategies and to create replicable financing and implementation models that can be flexibly adapted to the respective context.



MODUS OPERANDI

The Morgenstadt Initiative is supported by the innovation network consisting of local authorities, companies and Fraunhofer Institutes. The activities in the individual pillars are defined by innovation partnerships, which are operated by interested partners and follow their own project description. Thus, innovation partnerships exist with a focus on **research and development**, with a focus **on global scalability and transnational knowledge and technology transfer**, and with a focus **on market design**. Each of the three areas is managed by one person in the network management, who is in close contact with the project leaders of the innovation partnerships. This ensures that the generated knowledge is made available to the entire network after the project is completed and that the partners of the Innovation Partnerships have access to the information and services of the network.



For an **Innovation Partnership**, Fraunhofer institutes, cities and companies join forces to address a specific challenge and develop projects that can serve different formats. On the one hand, this makes it possible to respond to a specific call for proposals, and on the other hand, it is possible to develop offers that are directly addressed to companies and cities. In addition, innovation partnerships can have a regional character by bringing together a selected group of actors in a regional context to respond to their local needs.

In addition to the Innovation Partnerships, each of the three pillars contains activities aimed at **communicating** the content to the general public or specific stakeholder groups outside the Morgenstadt Initiative, as well as its economic **utilization**. Utilization therefore brings all three pillars together, in that the utilization of knowledge within one pillar provides impetus for the other pillars.

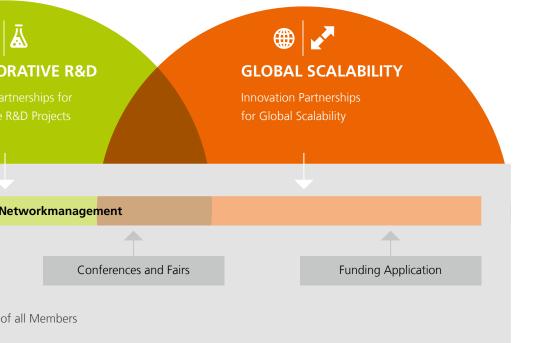


Figure 3: Network Activities and Modus Operandi of the Morgenstadt Initiative.

PILLAR 1: MARKET DESIGN – BUSINESS MODELS AND SCALE-UP FOR SOLUTIONS

For many Smart City applications and solutions in 2020, the following applies: there is no longer a lack of a proof of concept; rather, there is a lack of models and processes to quickly spread the solutions and scale them to a significant proportion of cities. Only if urban development transforms from pilot projects to a broad approach, smart solutions can develop their full potential for climate protection, resilience and a livable city. Another argument for scaling urban solutions is their economic potential. According to forecasts, the global sustainability market including infrastructure projects will grow to a volume of US\$ 65 trillion in the next 15 years. Sustainability technologies and their market introduction can therefore represent a central pillar for Germany/Europe as an innovational and industrial location in the future and at the same time contribute to a vital transformation of the economy.

By focusing on active market design, the Morgenstadt Initiative wants to make an active contribution to this. The scaling of sustainable urban solutions requires the scientific preparation of innovative technical solutions with regard to their variations, adaptation and financing possibilities in order to make them accessible to municipalities. In addition, **new, holistic value mo-dels** are needed that no longer calculate profitability on a purely market economy basis, but also take into account considerations of the common good and climate justice, as well as **new public-private partnerships** to finance and operate them. **Close coordination between local authorities, legislators and the private sector** is also needed to overcome not only financial but also legal barriers to innovative solutions in our cities. In this capacity, the Morgenstadt Initiative is creating new partnerships and innovative alliances to spread urban innovation across the board. The **utilization of existing Morgenstadt research** and the **creation of this** project.

Activities in Market Design (2020/21)

Communication, Networking and Collaboration

- Development and publication of a comprehensive position paper on a "Sustainable Cities and Regions" ("Zukunftsfähige Städte und Regionen") in Germany in cooperation with federal initiatives (e.g. Stadt.Land.Digital) and strategic partners Time schedule: publication in April 2020; Deliverable: publication
- Participation in the "European Innovation Partnership Smart Cities and Communities" (EIP SCC) for the development of transfer vehicles and solutions Time Schedule: 2020/21; Deliverable: participation in the events of the EIP SCC Action Clusters on Replication and Data Platforms
- Publication series on the sustainability of selected cities in Germany in a special supplement of the "Süddeutsche Zeitung". Time schedule: throughout 2020/21; Deliverable: analysis and reporting on 12 cities
- Publication on the sustainability of mediumsized towns Time schedule: throughout 2020/21; Deliverable: survey and evaluation with exemplary cities
- Development of the communication and networking format "Morgenstadt meets Mittelstadt" Time schedule: throughout 2020/21; Deliverable: identification of partners and development of pilot events

Innovation Partnerships

- Development and spinoff of the "Data Competence Centre Cities and Regions" (DKSR) as a central institution for the digital transformation of municipalities. Time schedule: by the end of 2020; Deliverable: establishment of the organization as a joint venture
- 7. Development of a quality certificate for IoT products and components (interoperability, safety, open standards) in the Smart City context, focusing on priority use cases such as air quality

Time schedule: by the end of 2020; Deliverable: certification methodology

 Regional Partnership of the Innovation Network in Local Innovation Ecosystems to pilot systemic transformation agendas in the "Urban Development Initiative" (UDI) in the Brainport Region (NL) in cooperation with the municipalities of Eindhoven and Helmond. Time schedule: throughout 2020/21; Deliverable: five joint projects in the Brainport Region with partners from Morgenstadt

Utilization

- Transfer of existing Morgenstadt instruments and methods into marketable and scalable offers, e.g. by means of licensing, spin-offs or industrial partnerships.
 Time schedule: by the end of 2020; Deliverable: license agreements with companies for the commercialization of Morgenstadt tools
- 10. Development of a financing option of City Labs for medium-sized cities Time schedule: by the end of 2021; Deliverable: financing plan

PILLAR 2: COLLABORATIVE RESEARCH AND DEVELOPMENT (R&D)

In addition to our focus on market design, collaborative research activities continue to play a central role in the Morgenstadt Initiative. In line with our systemic approach, we focus on critical interfaces between sectors and systems in order to translate **holistic transformation agendas** into applications – e.g. networking of technologies and infrastructures to achieve CO₂ **neutrality in cities** and the integration of energy systems, mobility systems, data, buildings, nature-based solutions and public space in **neighborhood projects and smart districts**. On the other hand, the Morgenstadt Initiative addresses overarching issues of sustainable urban development – such as the **digital transformation** of cities, **novel planning instruments** or stakeholder based innovation formats.

While some of the Collaborative R&D projects are already established or even underway at the beginning of the 2020/21 work program, new research topics and questions can be introduced by all partners at any time. If a sufficient number of interested partners are identified, the network management will set up a corresponding R&D program.

Activities in Research and Development (2020/21)

Communication

Communication directly from the R&D projects is carried out mainly through publications and relates directly to the content of the various projects. Due to the different status of the projects, up to now, mainly publications from the "Urban Data Partnership" (see below) are planned. However, publications from the other projects are quite feasible.

 Publication from the Urban Data Partnership: "Urbane Daten – von der Nutzung bis zur Wertschöpfung" ("Urban Data – From Use to Value Creation") Time schedule: by the end of May 2020; Deliverable: study



 Publication from the Urban Data Partnership: "Data Governance – Bausteine einer Organisationsfunktion für die Datenexzellenzorganisation" ("Data Governance – Building Blocks of an Organizational Function for Data Excellence Organization")
 Time schedule: until the end of April 2020; Deliverable: study

Innovation Partnerships

3. Urban Data Partnership: The Urban Data Partnership is an innovation network that addresses digitization officers and Chief Digital Officers (CDOs) of public utilities and other drivers of the digital transformation of our cities. The initiative aims to create a common understanding of the complex structures, processes and decisionmaking principles involved in the digital transformation of cities and municipalities and to provide practical assistance to the responsible specialists and managers. This is intended to create the strategic foundations for the organizational development of urban data governance on site. Expert contributions and the dialogue with likeminded colleagues help to make better decisions, to develop and apply the right tools and to speak with a strong voice towards national and EU policy and industry.

The Urban Data Partnership with 12 municipalities and their partners (municipal utilities/ data centers) has already been started in autumn 2019. A second group will be organized if there is sufficient interest. The research contents of the Urban Data Partnership refer to

- Data Governance (decision bases, data sovereignty, data ecosystem, data strategy etc.),
- Data platforms and architectures (standards, interoperability, open systems data models etc.),
- Data valorization (data management, use cases, data sets, employee training, holistic cost-benefit analyses).

Time schedule: until July 2021; Deliverable: thematic workshops with cities, networking meetings

4. Innovation Program CO₂ neutral Cities: The program is aimed at municipalities that wish to develop a master plan for achieving CO₂ neutrality and at companies that wish to develop new solutions and transfer vehicles for the planning process and/or the implementation of the master plan. It aims to develop integrated energy concepts for municipalities on the basis of well-founded analyses of local conditions and to develop target-oriented technology and infrastructure paths as well as implementation measures to achieve CO₂ neutrality. The basis is the establishment of a database for the evaluation of the climate neutrality of a city and a methodology for regular evaluation of progress. Companies are given the opportunity to



check their solution approaches for planning and implementation with regard to their integrability into the procedure. Based on the conception phase, demonstration projects for CO_2 neutral transformation in several cities in Germany and Europe are to be initiated from 2021 onwards and funding applied for.

The innovation program will start in mid-2020 and is open to interested cities and companies. The research contents of the Innovation Program CO₂ neutral Cities refer to:

- Analysis, evaluation and monitoring (collaborative development and testing of an energy and emissions database with a concept for regular, preferably automated data collection, design of an analysis methodology to assess the climate status and the effectiveness of possible measures),
- Energy concept and master plan development (identification of methods for integrated energy concept development as well as development of measures and master plan development (roadmap) to achieve CO₂ neutrality in various scenarios),
- Innovation partnership in the implementation of the master plan (market dialogue and innovation partnership to close existing gaps in supply),
- Master plan for process control (development of a procedure for establishing and implementing a master plan process including political decisions, citizen and expert participation, financing, etc.).

Time schedule: throughout 2020/21; Deliverable: innovation workshop, solution portfolios

5. "The Future of Public Space": This innovation partnership bundles several solutions for the efficient and sustainable use of urban space. It is aimed at solution providers with innovative ideas and concepts for the design of livable, efficient and networked public spaces and at municipalities that want to upgrade their public space. The aim is to identify coherent future options and solutions for municipal decision makers and administrations. The core of the innovative municipalities from all over Europe can apply to pilot one or more innovations in their own context. Jointly defined requirements for municipalities serve as criteria for evaluating and prioritizing applications. Fraunhofer experts will select the winning communities, which will become part of the Morgenstadt Initiative and receive support in piloting and evaluating the solutions for public space. The program will begin once ten companies and five cities have registered.

The contents of the innovation partnership are divided into:

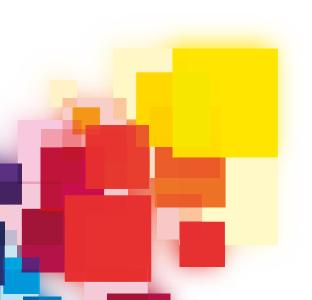
- Supply and system integration (identification and aggregation of innovative solutions for public space),
- Morgenstadt Challenge (Municipal competition for the enhancement of public space),
- Implementation (development and implementation of a proof of concept with the winning municipalities),
- Evaluation (scientific monitoring, analysis and recommendations for action).

Time schedule: throughout 2020/21; Deliverable: Morgenstadt-City-Challenge

Utilization

6. Development of a methodology for solution-oriented process organization for the transformation of urban systems as a marketable tool. Basis is the processing of innovation governance consulting offers and formalized processes.

Time schedule: by the end of 2020; Deliverable: workshop for the definition of formalized process flows



PILLAR 3: GLOBAL SCALABILITY OF THE MORGENSTADT APPRO-ACH AND INTERNATIONAL KNOWLEDGE AND TECHNOLOGY TRANSFER

The systemic approach of the Morgenstadt Initiative is also reflected in the development of the **Morgenstadt Framework** and its application model, the **Morgenstadt City Lab.** Both are based on the recognition that cities are complex adaptive socio-technical systems and that the transformation of a city must involve all these levels – from the technology and infrastructure level to the planning, governance and financing level, as well as the level of civil society and citizens. The Morgenstadt Framework provides a methodology to identify the most effective interventions for a city and to direct measures, investments and actors towards rapid system change in all sectors and institutions. It is important to bear in mind that the technical, economic and social contexts are different. Solutions must therefore be geared to the respective needs of the cities. In particular in innovation processes with a high degree of initial uncertainty, such as the transfer of solutions with a large distance between the context of creation and use, there is a risk of a mismatch between needs and solutions. To address this challenge, a toolbox for **successful international knowledge and technology transfer (KTT)** is currently being developed on the basis of various research projects.

Since 2014 Morgenstadt City Labs have been successfully implemented in a total of 14 cities worldwide. Increasingly, the approach also functions as an urban transformation model in the context of international sustainability initiatives. Building on this work, the Morgenstadt Network aims to address the key challenges facing cities worldwide in 2020/21 and to apply the City Lab approach globally in various formats. These range from **joint modular consulting** to the definition and implementation of **systemic urban investment strategies**. At the same time, the aim is to further develop the toolbox for the successful international transfer of solutions developed in Germany and Europe within the framework of international project cooperation. In addition, cooperation with international organizations is sought in order to involve

them in the scaling efforts and to open up new markets and opportunities. Morgenstadt members are invited to become **part of the assessment and development team** and to participate in the planning and implementation of projects within the City Labs and KTT projects.

Activities in Global Scalability (2020/21)

Networking and Scalability

1. Establishment of the cooperation with UNHABITAT and the UN-SDG Action Group to apply the Morgenstadt City Lab approach through the UN network in 109 cities in emerging and developing countries.

Time schedule: throughout 2020/21; Deliverable: piloting of the collaboration with UN-HAB-ITAT and the UN-SDG AG in two joint City Labs in the Global South

 Partnership with the "Fond Mondial de Développement des Ville" (FMDV) to promote new innovative urban development projects in Gambia, the Ivory Coast, Morocco and other African countries with regard to participatory budgeting.

Time schedule: by end of 2020; Deliverable: methodology for participatory budgeting

 Partnership with strategic partners from politics and international financing institutions in South East Asia to strategically develop the ASEAN region for the Morgenstadt Initiative. Time schedule: development of innovation partnerships until March 2021, Deliverable: first joint projects

Innovation Partnerships

4. "Morgenstadt Global Initiative" (MGI): innovation partnership for the development and implementation of measures to reduce CO₂ emissions and to adapt to climate change in countries of the Global South. The project, which is financed by the International Climate Initiative, uses City Labs to develop roadmaps for reducing CO₂ emissions in three cities: Saltillo (Mexico), Piura (Peru) and Kochi (India), and to implement one measure each.

The research content of the project includes:

- Adaptation of the Morgenstadt Framework to the conditions of cities in the Global South.
- Development of financing plans for the implementation of measures in countries of the Global South.

Time schedule: May 2019 to April 2022; Deliverable: revised framework, financing plans.

5. Further development of the KTT toolbox into a scalable advisory instrument. Collaboration with Morgenstadt Partners to develop and test online-based partial instruments and a partner-based scaling strategy.

Time schedule: September 2020 to June 2022; Deliverable: validated tools

Utilization

6. Further development of the Morgenstadt Framework into a scalable consulting instrument. Collaboration with Morgenstadt Partners to transform the framework into a semi-automated and online-based survey and analysis tool. Development and testing of a partner-based scaling strategy.

Time schedule: September 2020 to June 2021 – Deliverable: online tool

Market Design	Collaborative R&D	Global Scalability
Communication, Networking and Collaboration	Communication	Networking and Scalability
 Position Paper "Sustainable Cities and Regions" ("Zukunftsfähige Städte und Regionen") in Germany Participation in the European Inno- vation Partnership Smart Cities and Communities (EIP SCC) Publication series on the sustaina- bility of selected cities in Germany Publication on the sustainability of medium-sized towns and cities Development of the communicati- on and networking format 	 Study: "Urbane Daten – von der Nutzung bis zur Wertschöpfung" ("Urban Data – From Use to Value Creation") 	 Cooperation with UNHABITAT and the UN-SDG Action Group Partnership with the Fond Mondial de Développement des Ville (FMDV) Partnerships with strategic partners in South East Asia
 Governance & Process R&D Datenkompetenzzentrum Städte und Regionen (DKSR) ("Data Com- petence Centre Cities and Re- gions") Quality certificate for IoT products and components Regional Partnership Urban De- velopment Initiative (UDI) in the Brainport Region (NL) 	 Technological R&D Urban Data Partnership Innovation Program CO₂-neutral Cities »The Future of Public Space« 	Governance & Prozess R&D Morgenstadt Global Initiative (MGI)
 Commercialization Marketable and scalable offerings Deliverable Workshops Financing of City Labs for medium-sized cities Development of a methodology for the solution-oriented utilization of offers 	Utilization Revision of a framework for process development in decision-making processes 	 Global Utilization Further development of the Morgenstadt Framework
Knowledge- and Network Management		

Three Network Events (Conferences, Meetings) annually



NETWORK MANAGEMENT

The principle of the Morgenstadt Initiative is based on the **network effect.** The central network coordination provides the instruments for all partners to exchange and connect on activities and partial results. A **knowledge management system** with continuous updates ensures that all partners can follow the progress of individual projects and activities – and can participate if they are interested. The overall coordination of the Morgenstadt Network is carried out by the Fraunhofer Institute for Industrial Engineering IAO. Its tasks include:

- Network communication by coordinating the flow of information between all parties involved
- Communication about the status of projects
- Knowledge management through the administration of the Morgenstadt OwnCloud
- Organization of events and workshops
- Public Relations and Dissemination
- Coordination of contractors and third parties within the projects
- Network Communication: communication in the network takes place between all partners and is centrally supported by the Morgenstadt management. Information and updates are provided in the form of e-mails, newsletters, reports and briefings. All members regularly receive the Activity Tracker with current information on research projects, conferences and events as well as important developments and initiatives in Morgenstadt.
- Knowledge Management: all members receive access to the Morgenstadt Owncloud Platform, where all documents, contacts, current newsletters, activity trackers and projects are stored. Regular consultations between the Morgenstadt management and members serve to connect members with synergy potential or to identify individual options for cooperation resulting from the work.



- Networking Events: all members and strategic partners of the Morgenstadt Network are invited to attend the Morgenstadt Network events to exchange ideas and gain insights into the latest developments in sustainable urban development. The network events serve to communicate updates from the projects and innovation partnerships, prepare new projects and funding applications, network the Morgenstadt partners and learn about best practices on site. The following events are currently planned:
 - 1. Network meeting in June 2020 with workshops on various innovation partnerships and planned funding applications
 - 2. International Morgenstadt-Event to present first results of the Urban Development Initiative in Eindhoven in October 2020
 - 3. Closing event of the Urban Data Partnership in March 2021
 - 4. Morgenstadt Workshop on the Morgenstadt Framework and its possible applications
- Dissemination: the Morgenstadt Initiative actively participates in important trade fairs and conferences on sustainable urban development and represents its members there. Depending on interest and participation, joint stands and content-related contributions can be organized and offered. Participation in the following trade fairs is planned for 2020:
 - 1. Smart Country Convention in Berlin in October 2020
 - 2. Smart City Expo in Barcelona in November 2020

PROJECT LANGUAGE

The project is bilingual (German/English), the main project language being English. Research activities and project development in German cities will be conducted in German. International research activities and project development will be carried out in English. Relevant result documents will be written in German and English for all project members. The discussion language at the network meetings and project steering meetings is usually English, but may vary depending on participation.

FURTHER INFORMATION

and our partners can be found on www.morgenstadt.de/en.html



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