BEA-APP
BALTIC ENERGY AREAS
A PLANNING PERSPECTIVE

EU STRATEGY FOR THE BALTIC SEA REGION
FLAGSHIP

Interreg
Baltic Sea Region

EUROPEAN UNION
EUROPEAN
REGIONAL
DEVELOPMENT
FUND

RES mix in peripheral areas

Green industrial areas in Mecklenburg- Vorpommern

Ministry of Energy, Infrastructure and Digitalization Mecklenburg-Vorpommern, PP 1

CONTENT

1. Introduction

Based on the high interest of the stakeholders in the German federal state of Mecklenburg-Vorpommern (M-V), as well as the recognition of the necessity for the sustainable development of the business locations, the topic green industrial areas was brought to a higher level and anchored as a political goal in the coalition agreement of the state government. Instead of a one-site feasibility study, political support made it possible to develop a general methodology for transferring the approach to all commercial and industrial sites in the region and to set up and to launch a state initiative on green industrial areas.

The state initiative promotes the supply of industrial parks with renewable energies as well as the efficient use of this resource, as a contribution to the energy transition and to climate protection. Crucial key issues such as the security of supply and the reduction of CO_2 emissions will be further pursued in the future. However, this is only the first step. A sustainable, efficient land management, the further linking of the electricity, heat and transport sectors, as well as the strengthening of entrepreneurial cooperation in industrial parks, are additional aspects that are particularly supported in the context of the state initiative. The aim of the initiative is to increase the attractiveness of industrial and commercial sites, thus promoting the establishment of new businesses and job creation. At the same time, the generated synergy and marketing effects will be used.

2. Stakeholder involvement

The first step in implementing the pilot was the consultation of key stakeholders in the region. For this purpose, the dialogue forum “Green industrial areas in M-V” was established. Representatives from the spatial planning, energy, political and economic sector were invited. Initially, this forum was used to draw attention to the Interreg BSR project BEA-APP, to explore the interests of various stakeholders regarding sustainable management of industrial parks, and to develop cooperation in the region. During the course of this pilot, this platform was used to discuss drafts, collect feedback and strengthen the cooperation. In general, a core group of stakeholders, shown in Figure 1, was involved in the dialogue meetings to monitor and support the whole implementation process.

Very important stakeholders in the implementation process were the local actors – the municipalities, the mayors, economic development promoters, municipal utilities and local entrepreneurs. The collaboration with the local actors was essential for the success of the pilot case. For the analysis and mentoring of each pilot area several round table discussions with the local actors were carried out.

The discussion on specific topics regarding the strategic and conceptual development of the state initiative, such as the marketing strategy, were conducted in thematic dialogues

in small group round table discussions. Cooperation with regional research institutes and with the Metropolitan Region Hamburg were established during the pilot project.

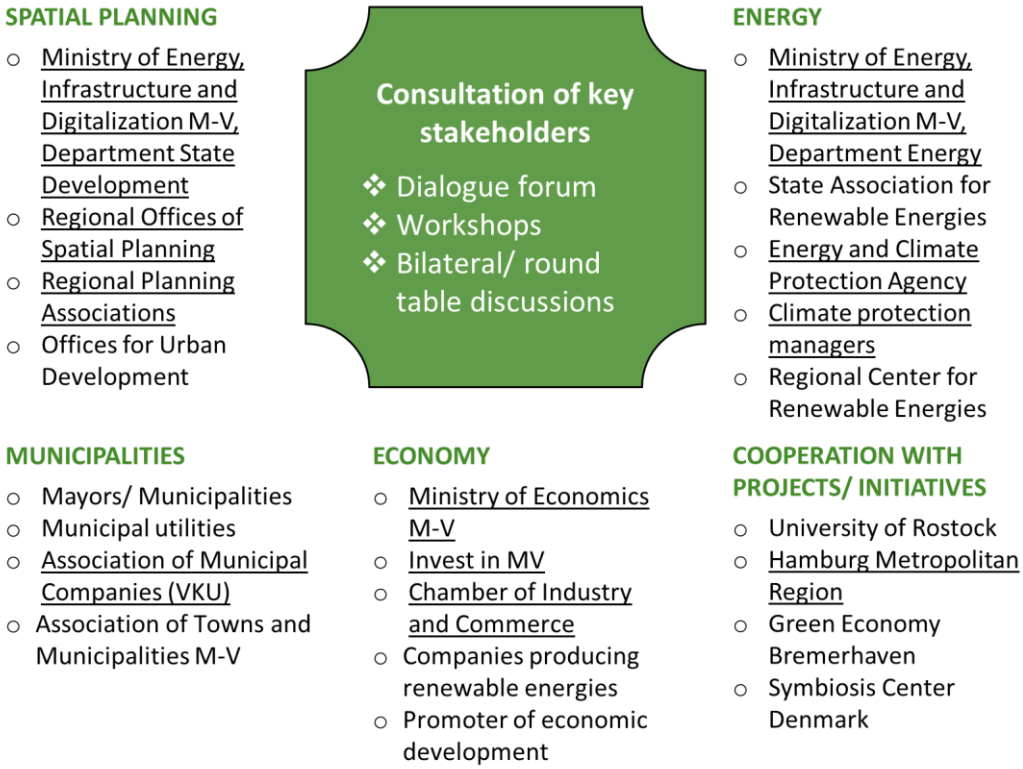

Fig. 1: Involved stakeholder

In the framework of the stakeholder involvement process, a promising market and a major demand for the establishment of green industrial areas especially by the marketing sector was identified. Good examples already exist in M-V, which are made "visible" within the state initiative. For example, several industrial sites already have a renewable energy supply and an integrated energy concept. Other industrial and commercial parks are on the way and have promising potential for demand-related development as a green industrial area.

Clear and transparent internal and external communication, in combination with a constructive culture of open criticism and discussion, were decisive factors for the successful involvement of stakeholders in M-V. Confidence building as well as early, interdisciplinary involvement of experts and regular feasibility checks have made a major contribution to the further development of the pilot project towards a state initiative.

3. Objectives and implementation process

The implementation process of the German pilot case included the following four phases:

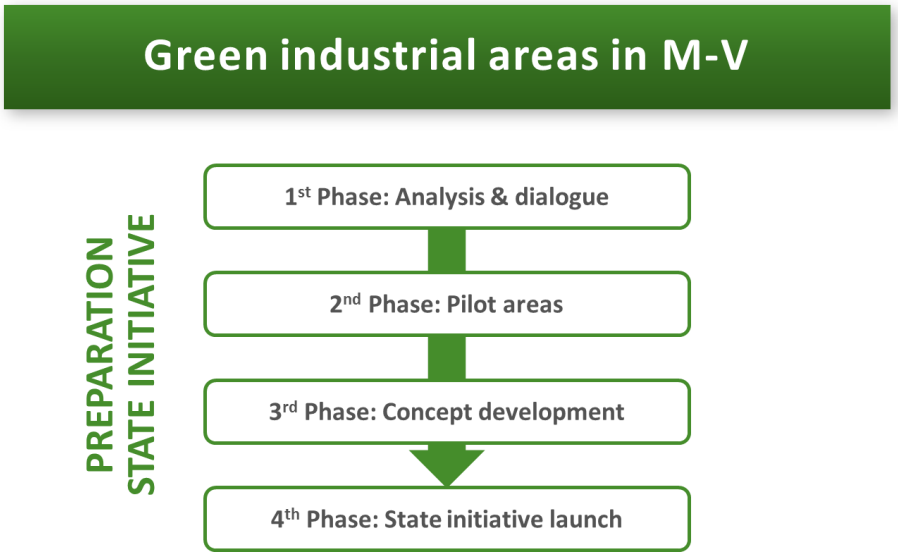

Fig. 2: Phases of the implementation process

The 1st phase started with the establishment of the dialogue forum and the analysis of existing certifications, criteria and similar projects and initiatives. On that basis, the term green industrial area was defined for the region M-V.

- Definition of GREEN INDUSTRIAL AREA:

"Green industrial areas consist of a cluster of companies that use renewable energy generated on site for their work and production processes, thus contributing to the implementation of the energy transition and the reduction of greenhouse gas emissions."

Another significant part of this phase was the determination of criteria for the selection of pilot areas in dialogue with regional stakeholders as well as the survey and assessment of industrial and commercial sites nominated by the participants of the dialogue meetings.

During the process, various industrial and commercial areas were nominated. A total of 28 proposals were submitted by the involved stakeholders.

The first phase was finished in June 2017 with the selection of the pilot areas (figure 3). In discussions with the members of the dialogue forum, six industrial and commercial sites were chosen for an in-depth analysis.

The 2nd phase was dealing with the pilot areas. For each selected pilot area, profiles were compiled in cooperation with the local actors. Therefore, the following aspects were investigated:

- Area size and actual available space,
- Planning status,
- Transport connection,
- Existing RES plants,
- Power and heating grid,
- Cooperation partners, as well as
- Local commitment, engagement and acceptance.

In addition, the potential for development in the fields of RES, mobility, digitalization and industrial symbiosis was analyzed.

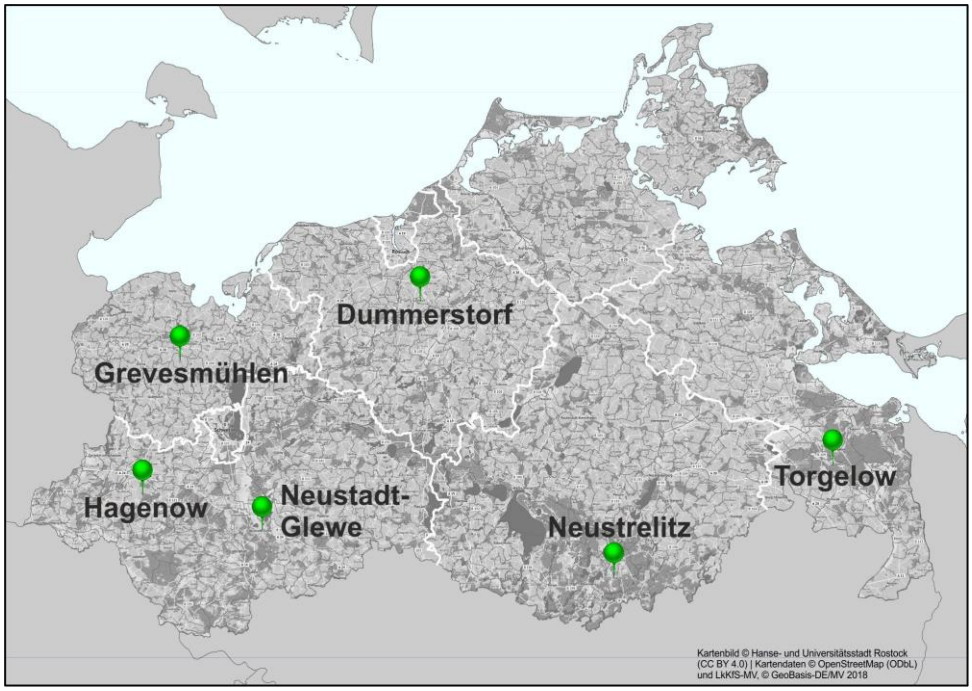

Fig. 3: Location of the pilot areas

In the second, third and fourth phase mentoring activities were carried out to support the local actors and the further development of the areas.

During the process, several meetings with local actors were conducted, including site visits to all pilot areas, to get detailed information on the local conditions and the planning situation, as well as to identify potentials and barriers. Based on this, the mentoring activities were adapted on the special needs of the local actors and the selected pilot areas.

The 3rd phase included the concept development for the state initiative. This required the determination of the structural and procedural organization. In the framework of the

mentoring activities within the state initiative, possible sources of funding on regional, state and EU level were compiled, addressing the following topics:

- Construction and expansions of RES plants/installations,
- Energy efficiency, energy management and energy consulting,
- Energy-efficient building,
- Electric mobility,
- Digitalization,
- Climate protection,
- Resource efficiency, and
- Environmental protection.

Based on the assessment and evaluation of the pilot areas, requirements were elaborated which have to be fulfilled by industrial and commercial areas for the certification as a green industrial area (G^3). This requirements catalogue consist of a mandatory part – the basic requirements – and a bonus system for the further qualification of the industrial parks.

Fig. 4: Label for the certification of industrial and commercial areas

In addition, the concept development focused on the communication and marketing aspect of the state initiative. For the visual identity of the state initiative, a brand was created and a label for the certification was developed. In order to draw attention to the state initiative, which arose from the Interreg BSR project BEA-APP, a brochure was elaborated.

In **the 4th phase** the implementation process of the German pilot case was finalized with the opening event of state initiative in July 2018.

4. Pilot areas – Feasibility of RES mix

The goal of the selection process was to choose industrial and commercial areas which are as different from one another as possible to get a wide range of input for the elaboration of certification requirements. Following the third dialogue meeting, six industrial and commercial sites were selected as pilot areas, which are located in the following municipalities:

- Dummerstorf,
- Neustrelitz,
- Torgelow,
- Grevesmühlen,
- Hagenow and
- Neustadt-Glewe.

In the course of the project, an industrial site in Anklam was chosen as an additional pilot area. The selected pilot areas are spread across M-V. These areas are characterized by completely different local conditions. There are smaller and bigger areas, and both industrial parks which are older with no additional capacity for the establishment of new businesses, as well as recently designated industrial and commercial sites. The selection includes also sites where an RES mix is already established, and areas which have potential for the integration of additional RES.

All of the selected industrial and commercial areas were analysed in detail. The focus of the in-depth analysis was on the one hand the establishment of a RES mix and the direct supply of these areas, on the other hand the acceptance and engagement of the actors with regard to renewable energy and the development of green industrial areas played an important role. Further aspects which are related to the development of renewable energies and which have been investigated aim at the sectors sustainable land development, alternative mobility and entrepreneurial cooperation.

Further stakeholder involvement formats were introduced on the basis of the dialogue meetings at which suitable pilot areas were proposed and mayors had the opportunity to promote their business locations and their commitment and the engagement of local decision-makers. These formats served in particular to explore and ensure the acceptance of the local actors and to advance the detailed analysis of the selected industrial and commercial areas.

For each pilot area round table discussions were organised with local actors - with the responsible mayors, city representatives and local utilities - in order to identify local needs, barriers and wishes and to establish cooperation between local actors on the issue of green industrial areas. At the same time, the state of planning and the development potential of the respective industrial and commercial area were discussed in detail in order to draw up the characteristics of the individual sites and to define a concrete set of actions for the implementation of a renewable energy supply and for the sustainable development towards a green industrial area. In addition, questionnaire campaigns and

interviews with local companies were conducted, particularly in the pilot areas of Anklam and Hagenow. In addition to data collection and potential analysis, the discussion rounds and interviews served to develop a feeling for local needs and to align the mentoring activities of the Ministry of Energy, Infrastructure and Digitalization M-V on it.

The Ministry of Energy, Infrastructure and Digitalization M-V as mentor is the contact partner and offers local actors a platform within the framework of the state initiative to inform and exchange information on current developments in the fields of RES, spatial planning, mobility and digitalization, among others, and at the same time acts as an interface to other consulting services in the state (e.g. subsidy consulting, efficiency consulting, acceptance campaigns). In this way, local actors are supported in implementing the planned measures to establish a RES mix or a RES supply of the industrial parks. The mentoring activities will also be continued after the end of the BEA-APP project.

In order to analyse the feasibility of RES-mix and the spatial possibilities for the renewable energy development of the selected pilot areas, various spatial analyses were carried out. The analyses of the renewable energy potentials took place both at the level of the federal state and in detail for the individual commercial and industrial sites on a municipal scale. The spatial analyses also include the investigation of the green space share and the potential for expansion areas.

The investigations at the federal state level related in particular to wind energy. The focus was on the capacity and the number of wind turbines within a radius of 5 km around the industrial and commercial areas (ANNEX 1 & 2). In addition, it was analysed when these turbines went into operation in order to be able to deduce when these wind turbines would no longer be eligible for support under the German Renewable Energy Act (EEG) and could thus be used for the direct electricity supply of industrial and commercial sites (ANNEX 3). In addition, at the level of the four planning regions in M-V, it was examined whether suitable areas for wind energy are located in the immediate vicinity of the industrial and commercial locations.

In addition, the spatial potentials of bioenergy were also included in the investigations at the federal state level, especially against the background of a possible renewable heat supply of the industrial- und commercial sites (ANNEX 4). The solar energy potentials were examined on the basis of the number and the orientation of the roof areas. For the industrial parks in Anklam and Hagenow, a company-specific analysis of the potentials for the installation of photovoltaic roof systems was carried out. In addition, a master thesis on the sustainable development of the industrial area in Anklam at the University of Rostock was initiated and supervised by the Ministry of Energy, Infrastructure and Digitalization M-V, which also dealt with solar potential analysis.

In the following, the in-depth analysis of the individual pilot areas are summarised, including details on the acceptance and commitment of the local actors. Based on the

results, measures regarding the feasibility and the implementation of a RES mix and/or r the further development of renewable energy supply will be derived.

Industrial park “Autobahnkreuz Rostock” (Dummerstorf)

The industrial and commercial park “Autobahnkreuz Rostock” is located in the municipality of Dummerstorf in the immediate vicinity of the largest city in M-V, the Hanseatic City of Rostock, and in the immediate vicinity of the Baltic Sea and Rostock-Laage Airport. The location of the industrial and commercial park directly on the motorway provides excellent transport connections to the Rostock and the Wismar seaport as well as to the metropolises of Hamburg, Berlin and Szczecin. The municipality of Dummerstorf has approx. 7,000 inhabitants and consists of six districts. Due to their convenient location, there is "above-average" demand for industrial sites in the municipality.

The municipality is planning a step-by-step implementation of the industrial and commercial park "Autobahnkreuz Rostock", an important industrial and commercial site throughout the state, which is anchored in the State Spatial Development Programme M-V. This industrial site is part of the Regional Spatial Development Programme Rostock with a total area of 100-120 ha. The land use plan for the first construction phase is legally binding (B-Plan „Gewerbe- und Logistikzentrum Ostsee“) and the development took place during the project period in 2017.

The goals of the municipality of Dummerstorf with regard to the state initiative primarily include the regional creation of value through the production and use of renewable energies. The municipality focuses on wind energy for the direct supply of adjacent residential and commercial areas. Sustainability and ecological development of the municipality play an important role. In 2012, the municipality set up a working group on energy topics to address the challenges of energy transition and climate mitigation. The municipality operates a biogas plant and a local heating network. The analyses showed that a further expansion of the network to supply the industrial park with renewable heat is not economically viable.

In the Rostock planning region, the energy chapter of the Regional Spatial Development Programme is currently being updated. This includes the designation of new areas suitable for wind energy in the region. Two potential wind energy areas are located in the immediate vicinity of the pilot area. Depending on the participation of citizens, a decision is expected at the beginning of 2020.

Numerous other actions for the spatial development of the renewable energy potential of these industrial and commercial site depend on this.

As part of the state initiative, the following measures were formulated to implement a RES mix:

- Power generation from wind energy and supply of the community (incl. industrial park)
- Storage of surplus power (battery storage)
- Surplus power use for local heat supply or cooling (power-to-X)
- Foundation of a municipal company for renewable energy supply (under discussion)
- Installation of e-charging stations

The settlement of the first company was completed in 2018. The logistics centre of the food retailer NORMA is a company in which sustainability aspects such as renewable energy supply and energy efficiency are components of the company strategy. The company is certified in accordance with the ISO 14001 environmental management standard. In addition, the latest building and logistics technology was used for the new location. The waste heat from the highly efficient CO_2 refrigeration and cooling plant is used to heat the logistics centre. In addition, a photovoltaic system on the roof of the new logistics centre generates electricity for the company's own consumption.

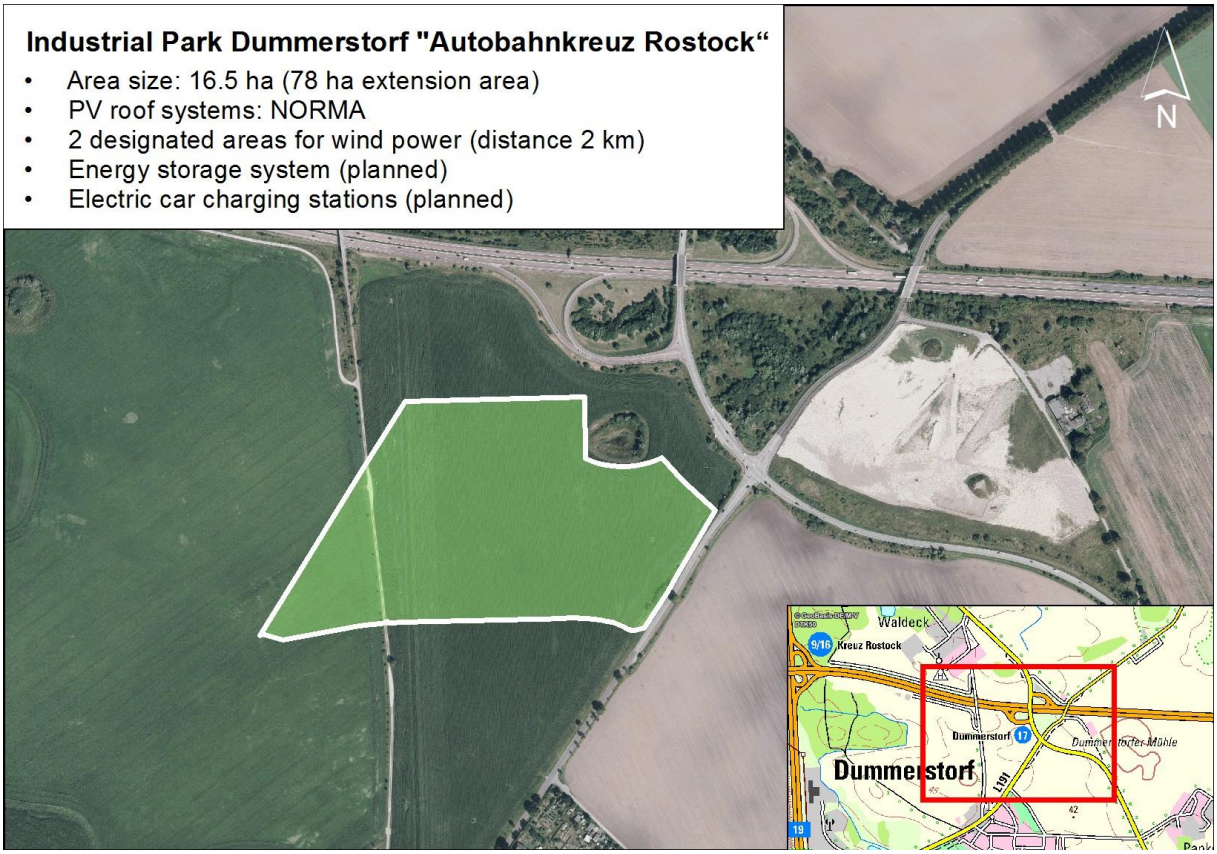

Fig. 5: Pilot area Dummerstorf

The municipality is currently holding talks with other companies regarding new settlements on the site, in which sustainable development plays a major role. Negotiations on the establishment of a petrol station and a fast food restaurant are about to be completed. In addition, a wholesaler of equestrian products has already shown great interest in the location.

Industrial park “Kiefernheide” (Neustrelitz)

The industrial and commercial park “Kiefernheide” is located in the town of Neustrelitz, in the southern part of M-V. Currently there are about 20,000 inhabitants living in the community, which consists of the city centre and 16 other districts. From a traffic point of view, Neustrelitz is situated a bit away from the main traffic routes, in some distance to the nearest motorway (approx. 50 km), the nearest port (approx. 150 km to Rostock seaport) and the nearest airport (approx. 100 km to Berlin-Tegel airport).

The city of Neustrelitz is a very ambitious municipality, especially in the areas of renewable energies, climate protection and digitisation. The local public utility company (Stadtwerke Neustrelitz), the municipality and the State Centre for Renewable Energy M-V work hand in hand to promote the sustainable development of the municipality. The new city strategy for 2025 “green smart digital” unites the visions of the local actors.

The city has set itself the goal of becoming a centre for modern information and communication technologies. The city's public utility company, for example, is planning to install the first comprehensive gigabit fiber-optic network in M-V. In addition, Neustrelitz plays a pioneering role in M-V in the field of renewable energy supply and can cover most of its electricity and heat demand from RES. For this reason, the city was awarded the title "Bioenergie Kommune 2016" by the Federal Ministry of Food and Agriculture.

The development and implementation of a green business park is a further component in the realisation of the city vision 2025. The pilot project and the state initiative offer the local actors the opportunity to continue their successful activities with the aim of expanding the renewable energy supply and linking the produced renewable energy with sustainable information and communication technologies.

With a total area size of approx. 12 ha and possible extension areas of approx. 10 ha, the "Kiefernheide" industrial area is the smallest pilot area investigated in the BEA-APP project. In the land-use plan, the commercial area was designated as a special area for renewable energy use. The site is fully developed and unbuilt. Preferably energy-intensive companies in the sectors of logistics, food production and IT are being sought for a new settlement.

To the south, the site neighbours the biomass CHP plant of the public utility company Neustrelitz and the site of the State Centre for Renewable Energy M-V. Both the biomass CHP plant, which produces electricity and heat from wood chips, and the State Centre for

Renewable Energy M-V are equipped with photovoltaic roof systems. In addition, three e-charging stations are installed on the parking space of the State Centre for Renewable Energies M-V.

The local actors are planning to combine existing renewable energy plants with new renewable energy plants. The focus is on further photovoltaic roof systems and the construction of wind power plants. The electricity generated will be stored in an energy storage facility. In addition, the linking of the electricity and transport sectors is another important component of the pilot project. Additional public e-charging stations are to be erected. In addition, the conversion of surplus power into hydrogen and the construction of a hydrogen filling station on site will be discussed. All these components are to be incorporated into a sustainable energy concept for the site.

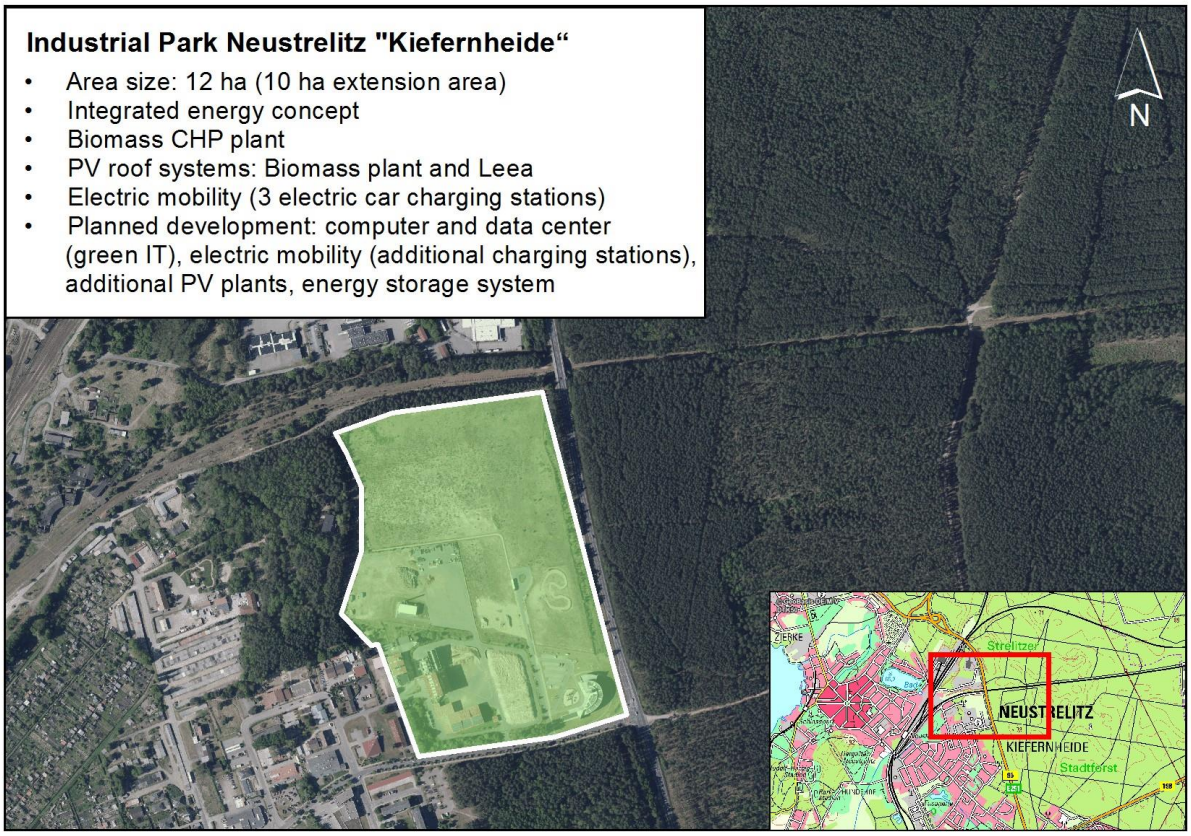

Fig. 6: Pilot area Neustrelitz

The following measures are planned as part of the pilot project for the realisation of a self-sufficient renewable energy supply:

- Construction and operation of additional PV plants
- Construction and operation of an energy storage system
- Heat/cold supply via existing heat conduction of the biomass CHP plant
- Expansion of e-mobility and establishment of e-charging infrastructure (additional e-charging stations, e-car and e-bike sharing)
- Construction and operation of wind turbines
- Post-utilisation concept for existing renewable energy plants (after EEG funding)

The business location is equipped with a fiber optic connection with up to 1 Gbit/s. In addition to this connection to the fast FTTH network (fiber to the home), the establishment of a computer centre (Green IT) in the commercial area is being planned, which will be cooled with the heat from the biomass CHP plant. These two aspects significantly increase the quality of the location and are intended in particular to appeal to companies from the IT sector who are looking for a location with a high level of data processing.

Industrial park “Borkenstraße“ (Torgelow)

The industrial park “Borkenstraße” is located in Torgelow, a small town with approx. 9,000 inhabitants in the eastern part of M-V. The town has been a foundry location since the 18th century and is still characterised by the industry today. One of the most modern iron foundries in Europe is located in the industrial area Borkenstraße. This metalworking company produces large castings, especially for wind turbines, and is the city's largest employer (approx. 400 employees).

The total size of the industrial park is 70 ha, of which 14.1 ha are still available. But for immission regulation reasons, no further company settlement is possible. However, expansion areas are available. In 2014, the fully developed industrial park was extended by 20 ha. In addition to the iron foundry, 15 other companies, including mechanical engineering, model and tool manufacturing and maintenance companies, are situated on site.

A biogas plant was built on the 2014 extension area and went into operation in 2018. The biogas plant processes approx. 65,000 t of renewable raw materials per year. The biogas produced is processed into biomethane and fed into the public gas grid. In addition a wood chip plant is operated to heat the fermenters of the biogas plant.

Furthermore there is a potential area suitable for wind energy 2 km away from the site. In the Planning Region Vorpommern the chapter Energy of the Regional Spatial Development Programme is also being updated. If the suitable wind energy area will be confirmed, the construction and operation of wind turbines will be a key component in supplying the industrial park with renewable energies and in implementing a RES mix.

In particular, supplying the energy-intensive iron foundry with wind power would represent a milestone in Torgelow's municipal development and contribute significantly to a sustainable and future-oriented development of the industrial park “Borkenstaße”. The iron foundry endeavors to generate its own wind power. The first talks with the owners of the areas, the city and the local public utility company in this matter already took place in 2017.

The industrial and commercial area has substantial potential for renewable energy development. The high amount of unused roof space, which is predestined for the installation of photovoltaic roof systems, is remarkable. In addition, the site also offers considerable potential in the field of alternative mobility.

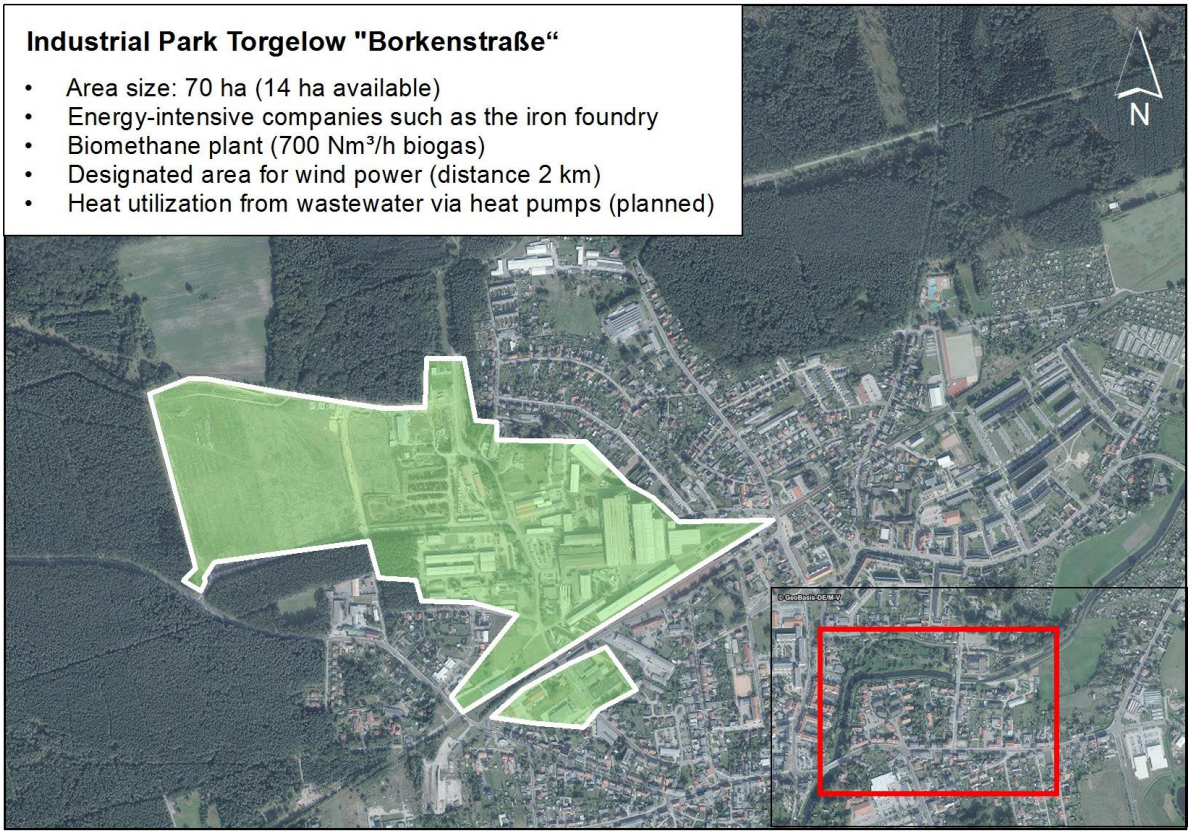

Fig. 7: Pilot area Torgelow

Overall, however, the industrial park is still at the beginning of a sustainable development, which is why the central action to exploit the renewable energy development of the pilot area is to strengthen the acceptance and commitment of local actors and to promote awareness of sustainability aspects. One focus in this context is the field of entrepreneurial cooperation.

Industrial park “Nord West“ (Grevesmühlen)

The city of Grevesmühlen, located in the western part of the German federal state of M-V and in the metropolitan region of Hamburg, has four designated commercial and industrial areas. One of them is the industrial and commercial area “Nord West”, which has a total size of approx. 21 ha. Grevesmühlen is located in the immediate vicinity of the motorway and has a direct connection to the Baltic Sea ports of Wismar and Lübeck. The city has 13 districts and approx. 10,000 inhabitants.

The industrial park “Nord West” is fully developed. An extension up to 40 ha is possible. The occupancy rate of the industrial and commercial site is approx. 85 % of the total area. The local public utilities (Stadtwerke Grevesmühlen), the Grevesmühlen waste water

association (Abwasserzweckverband Grevesmühlen), the Happy Texx textile printing works and Norddeutsche Wasser-Logistik GmbH have all settled here.

The municipality is a pioneer in the federal state and has comprehensive experience in the field of renewable energies. The city of Grevesmühlen and the cooperation of local actors are characterised by sustainable and ecological actions. In 2003 the network "Stadt ohne Watt" was founded, an association to promote sustainable municipal and regional development. Within the framework of this network, innovative projects for energy transition are increasingly being implemented. The local public utility company is also an active partner in the development and implementation of renewable energy projects. Currently, the local municipal utilities operate one wind energy plant, two biogas plants and nine photovoltaic plants.

In the industrial and commercial area, the waste water association runs a wastewater treatment plant equipped with a sewage sludge digestion. The sewage gas produced is used to generate renewable electricity and heat via CHP plants. A gas storage tank and a heat storage system are used to store the generated sewage gas and the generated heat. In addition, waste heat is recovered from the wastewater stream and used to heat the buildings. The wastewater treatment plant is the first energy-plus wastewater treatment plant in Germany, i.e. the plant produces more energy than it consumes. In addition, a shrimp farm is in operation at the site, whose wastewater is treated directly in the wastewater treatment plant. At the same time, the wastewater treatment plant supplies the shrimp farm with the high quantities of heat required for shrimp production via a local heating network. This is a very good example of entrepreneurial cooperation in the field of energy and material flow management (industrial symbiosis).

In addition, two solar parks are operating in the industrial and commercial area “North West”, one of them as a citizen solar park. In addition, a large number of the roof areas at the site are equipped with PV roof systems. There are no areas suitable for wind power in the immediate vicinity of the industrial site, so there is also no potential for the direct supply of wind power and the use of surplus power via power to x technologies. The wastewater treatment plant was expanded during the pilot project so that additional heat can be used. By expanding the local heating network, other companies could be supplied with renewable heat. This is a decisive location factor for the settlement of further companies. In the sector of alternative mobility, the installation of e-charging stations is being planned.

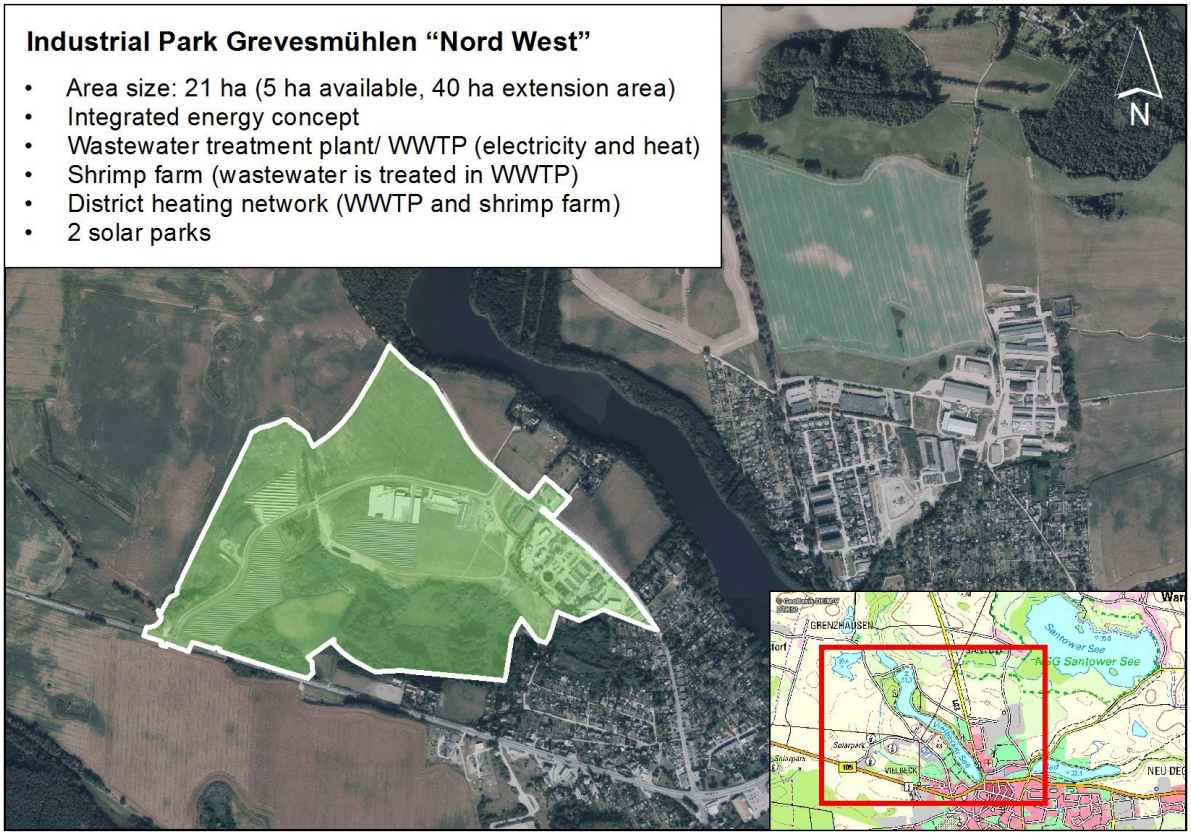

Fig. 8: Pilot area Grevesmühlen

Local actors are highly committed and have already tapped extensive renewable energy potential since the turn of the millennium. Grevesmühlen is a model commune of the energy transition and attracts a wide variety of delegations from all over the world every year. On the way to a green industrial area, it is therefore not primarily a question of developing further renewable energy potential, but of ensuring the direct supply of companies with renewable energy in the industrial area and expanding the area network. The renewable electricity tariff offered by local public utility company could also be an option for supplying the business location with a mix of renewable energies.

Industrial park "Lederwerk" (Neustadt-Glewe)

The industrial park "Lederwerk" is located in the town of Neustadt-Glewe in the immediate proximity of the motorway. It is a traditional industrial location, which was shaped by the leather industry and has a direct connection to rail and sea transport. Neustadt-Glewe is a small town in the administrative district of Ludwigslust-Parchim with approx. 7,000 inhabitants. The city has set itself the goal of becoming CO2 neutral by 2030 and has anchored this goal in the cities climate mitigation concept.

The industrial and commercial area "Lederwerk" is fully developed and has a total area of approx. 25 ha, of which approx. 6 ha are available for new settlements. The industrial park is characterized by some vacancies and underutilizations. Companies from the building

industry, metalworking business and medical technology as well as manufacturers of leather products and packaging materials are located at the site.

Neustadt-Glewe is the location of a geothermal heating plant which went into operation in 1995 and is located in the immediate vicinity of the industrial site. It was the first power plant in Germany to use geothermal energy from thermal water to generate electricity. The geothermal plant generated electricity and heat until 2010. Currently, the hot thermal water extracted from a depth of approx. 2,400 m is only used for heat production. The renewable heat produced is used to supply households and businesses in the city, with additional capacity available. New companies settling in the industrial area could use the existing geothermal energy to cover their heating needs. For this purpose, the local heating network has to be expanded.

Adjacent to the industrial area, there is also an old landfill, which was used for the deposition of leather remains. A photovoltaic plant is operating on this conversion site. Two other companies in the industrial park have equipped their roofs with PV systems. Overall, there is still potential to expand the use of solar energy in the industrial and commercial area. In addition, potential in the sector of alternative mobility has been identified. The installation of e-charging stations is under discussion.

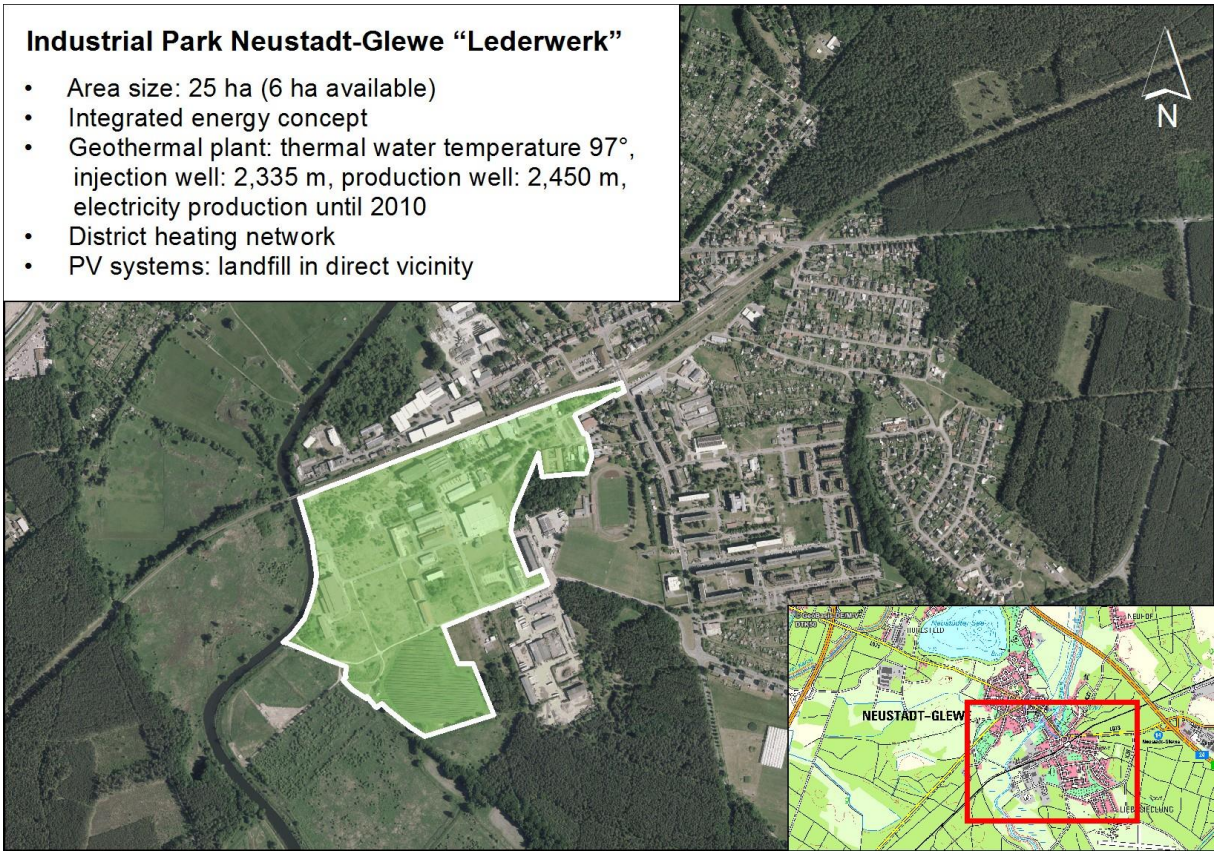

Fig. 9: Pilot area Neustadt-Glewe

In general, the municipality faces other challenges than the establishment of a RES mix or the further development of renewable energies at the site in order to successfully market the industrial park. From an urban planning point of view, parts of the business location

must first be revitalised. Further actions in preparation for a sustainable further development of the industrial and commercial area "Lederwerk" include the involvement of stakeholders and the increase of acceptance with regard to sustainability issues. In particular, activation, consultation and support as well as the establishment of cooperation structures play a decisive role in this process.

5. State initiative “Landesdialog Grüne Gewerbegebiete in M-V”

The state initiative addresses municipalities and companies as well as marketers of industrial and commercial areas. All industrial sites in M-V can participate - regardless of whether these are planned areas or already developed areas.

Fig. 10: Brand of the state initiative

The Ministry of Energy, Infrastructure and Digitalization Mecklenburg-Vorpommern supports the engagement of local actors through consulting services on funding opportunities, development of energy and management concepts, communication and knowledge transfer. On the one hand, thematic workshops are planned for all those interested, and on the other networking workshops will be held in the industrial parks to promote exchange between companies and to support the entrepreneurial cooperation.

The requirements of the G^3 label are subdivided into basic requirements and additional qualifications, and once an industrial area meets the basic requirements, it can be awarded the new label. The most important basic criterion for the awarding of the label is the supply of renewable energy. Those who produce renewable energy and primarily use it can be certified. Applicants must also indicate which measures they have already implemented or are planning to implement regarding the criteria energy management and energy efficiency. Information campaigns on sustainable land management represent the last basic requirement.

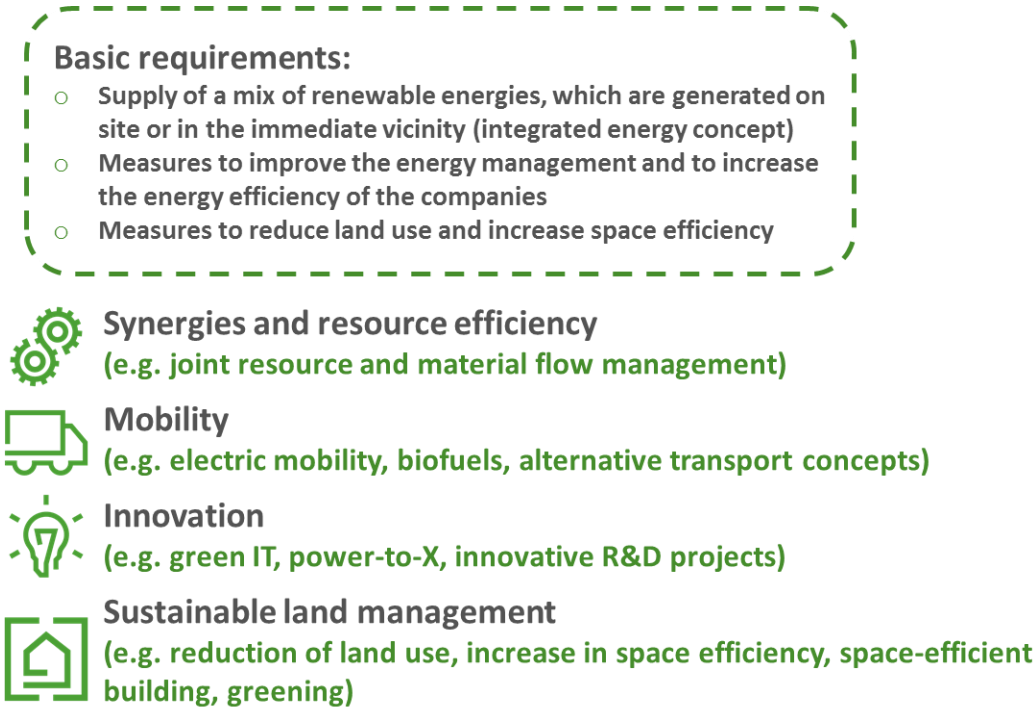

Fig. 11: Certification requirements for the G^3 label

A viable, sustainable development of industrial parks also requires that the sectors electricity, heat, transport are linked (sector coupling) and that the work and production processes of the companies are coordinated (industrial symbiosis). On-site collaborations will be encouraged through a bonus system which creates incentives for the further development of the awarded business parks and the creation of synergies. As part of the bonus system, the industrial parks can acquire additional qualifications if they are characterized by particular sustainability in four categories: synergies and resource efficiency, mobility, innovation and sustainable land management.

Fig. 12: Certification label with all bonus qualifications

The launch of the state initiative G^3 took place on 2nd of July 2018 in Anklam with 100 participants from politics, economics and science hosted by the Minister for Energy, Infrastructure and Digitalization M-V.

Source: Fotostudio Pixelperle

Fig. 13: Opening event in Anklam

Industrial park "Bluthsluster-, Industrie- und Werkstraße" (Anklam)

The industrial park "Bluthsluster-, Industrie- und Werkstraße" in Anklam is one of these industrial sites where sustainability aspects already play a vital role in the industrial park development. The Hanseatic city of Anklam is situated in the east of M-V, by the river Peene, in the immediate vicinity of the Baltic Sea and the island of Usedom. The municipality is located in the Szczecin Metropolitan Region, consists of 4 districts and has approx. 13,000 inhabitants.

The municipality is very active in the area of climate protection and has developed an integrated energy and climate mitigation concept in which measures such as the increased use of renewable energies, the conversion to LED street lighting, the installation of e-charging points or training in the area of energy efficiency and energy saving are anchored. The integrated energy and climate mitigation concept is currently being implemented, for this purpose the Hanseatic City of Anklam has hired a climate change manager.

The industrial park "Bluthsluster-, Industrie- und Werkstraße" has a total area of 104 ha. The sugar factory is the central player in the industrial park and the largest employer in the city. In addition to the sugar factory, about 30 other companies from the service sector,

the building industry and crafts businesses have settled here. This industrial site is a very good example of existing synergies, high potential and local commitment. Therefore it was chosen for the opening event even if it does not meet all the requirements for the G^3 certification.

The resident sugar factory is the only sugar factory that is still in operation in M-V. It produces biomethane from residues of the sugar beet processing and feeds it into the natural gas grid. It produces and markets bioethanol, produces sewage gas from the waste water of the sugar beet washing plant, supplies the local indoor swimming pool with heat and increasingly shifts its transport to rail. The company pursues a development concept aimed at increasing the sugar production while maintaining the energy consumption. In addition, it cooperates with other companies in the region in various sustainability areas, such as in the framework of the Bio-economic Cluster Western Pomerania.

Two more industrial areas in the south of the sugar factory were included in the detailed analysis in order to identify substantial development potential, particularly in the area of entrepreneurial cooperation. The investigations revealed potentials in the field of material flow management on the one hand and in the field of solar energy use on the other. For example, a company produces residual materials and wastewater that could be recycled or treated in the sugar factory under certain circumstances. In addition, many south-facing roof areas in the industrial and commercial areas are unused.

For the further development of renewable energies in the industrial park "Bluthsluster-, Industrie- und Werkstraße" the installation of a wind turbine on the site of the sugar factory is under discussion. Other considerations are the use of alternative fuels for the sugar factory transport, in particular for regular transport on fixed routes, and the establishment of a filling station for biofuels. For example, the sugar factory supplies Trolli located in the industrial park "Steegener Chaussee" in Hagenow. By converting the fuels of LKW´s on this route to biofuels, a significant contribution could be made in the area of alternative mobility, thus achieving a sustainable link between the two pilot areas.

The industrial park "Bluthsluster-, Industrie- und Werkstraße" is on a good way to promote the development of renewable energies at the location, to implement a supply from a mix of renewable energies and to achieve the award as a green industrial area. The Ministry of Energy, Infrastructure and Digitalization M-V will continue supporting and mentoring the local actors on this path. Further local activities are planned for the coming months.

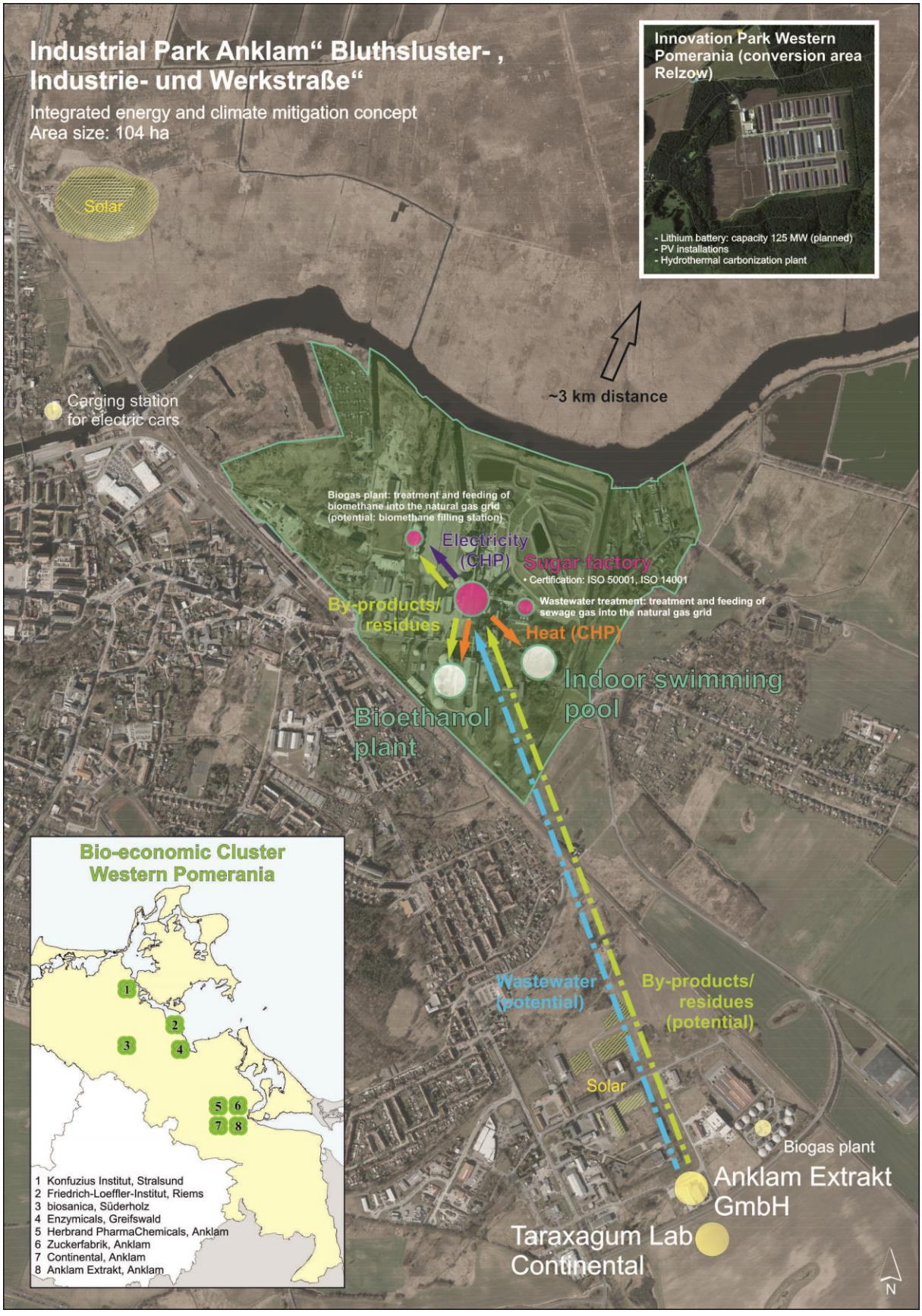

Fig. 14: Pilot area Anklam

6. Green industrial area Hagenow

The industrial park "Steegener Chaussee" in Hagenow was awarded as the first green industrial area in M-V on 5th of November 2018 by Minister for Energy, Infrastructure and Digitalization. The award ceremony was integrated in a stakeholder event with specialist lectures and subsequent workshops.

Source: Rainer Cordes

Fig. 15: Stakeholder event in Hagenow

The industrial and commercial area "Steegener Chaussee" in Hagenow is a historically grown site on which companies from the food industry, wood and plastics processing and metal construction have settled. In addition, there beats the energetic heart of the city Hagenow. A total of 50 companies are represented at the location, which cooperate with each other and employ about 1,200 people.

The industrial park is one of the pioneers in terms of renewable energy production and energy efficiency. The local generation of electricity from renewable energies exceeds the electricity demand of all companies in the industrial site. In addition, the heat generated locally from renewable sources covers more than 50 percent of the total heat consumption.

The topics energy efficiency and energy management are of high importance in numerous companies settled in the industrial park. Companies are certified according to the energy management standard ISO 50001, perform energy monitoring or use efficient energy management systems. In addition, many companies have converted to LED lighting and purchased energy-efficient machines.

The co-operation of the companies in the industrial park is pronounced and shows itself particularly in joint energy management. The industrial area "Steegener Chaussee" is not only a good example for a renewable energy supply based on bioenergy, but is also characterized by dedicated companies which focus on energy and material flow management, as well as on sustainability aspects such as resource efficiency and the use of synergies.

Furthermore, the business park is characterized by promising potential, especially in the area of alternative mobility. Currently, the implementation of a self-service car wash is carried out on the industrial site which will be supplied with electricity via PV roof systems (carport). The settlement is realized in combination with an electric car rental and the installation of charging stations (electric mobility center).

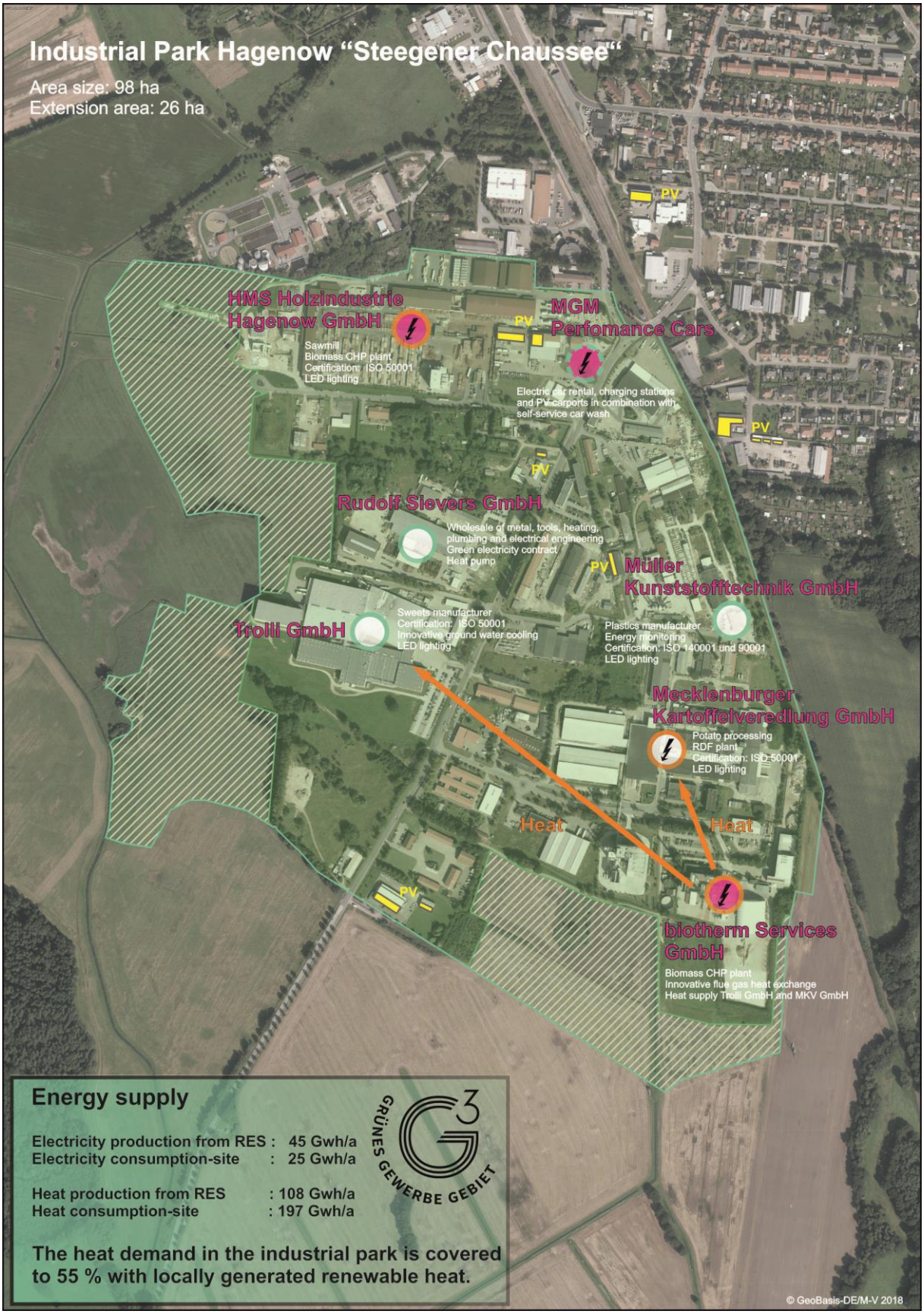

Fig. 15: Pilot area Hagenow

ANNEX

ANNEX 1: Wind energy potential of industrial- and commercial areas in M-V in relation to the capacity of wind turbines

ANNEX 2: Wind energy potential of industrial- and commercial areas in M-V in relation to the number of wind turbines

ANNEX 3: Wind energy potential of industrial- and commercial areas in M-V in the context of EEG funding

ANNEX 4: Bioenergy potential of industrial- and commercial areas in M-V

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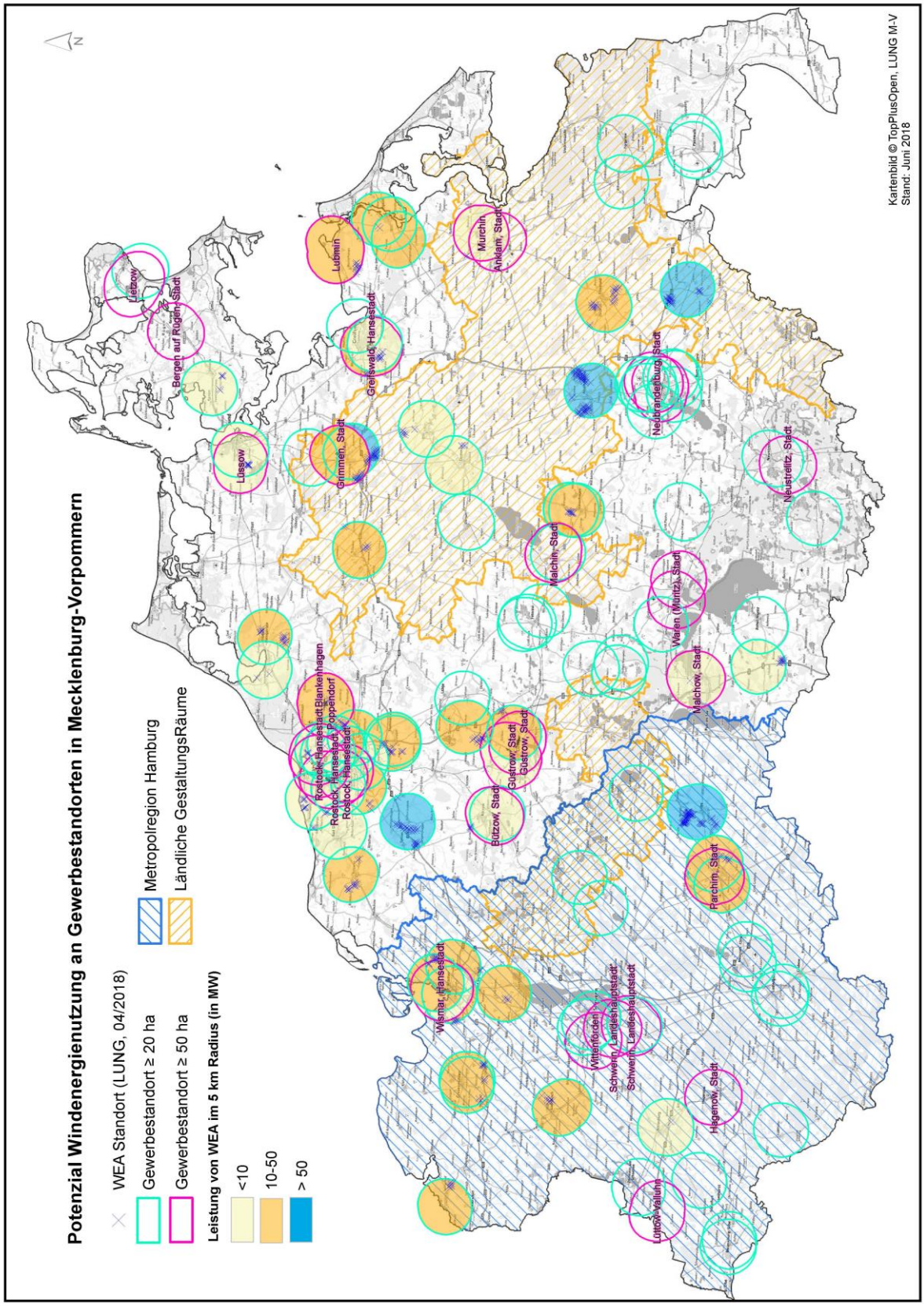

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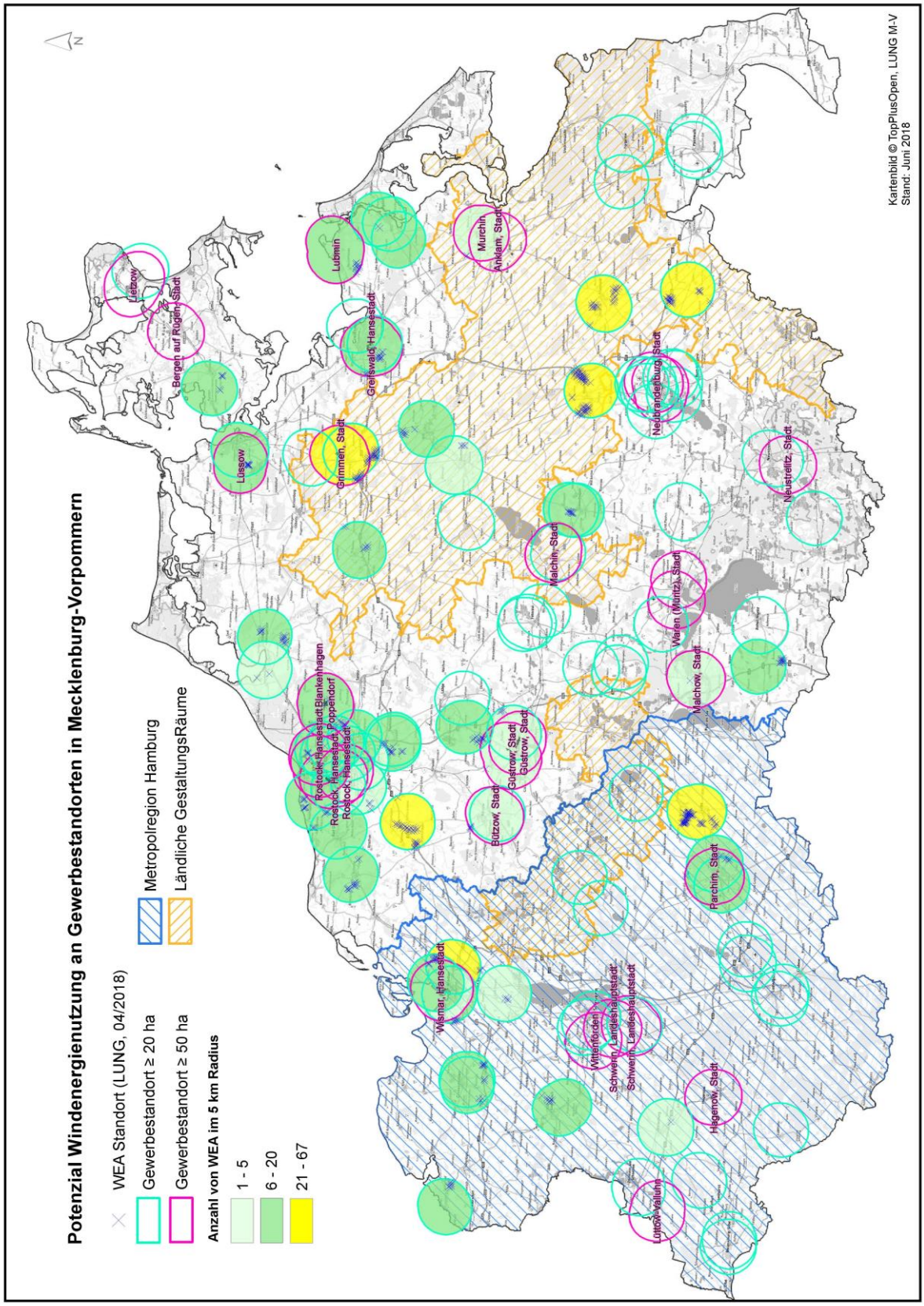

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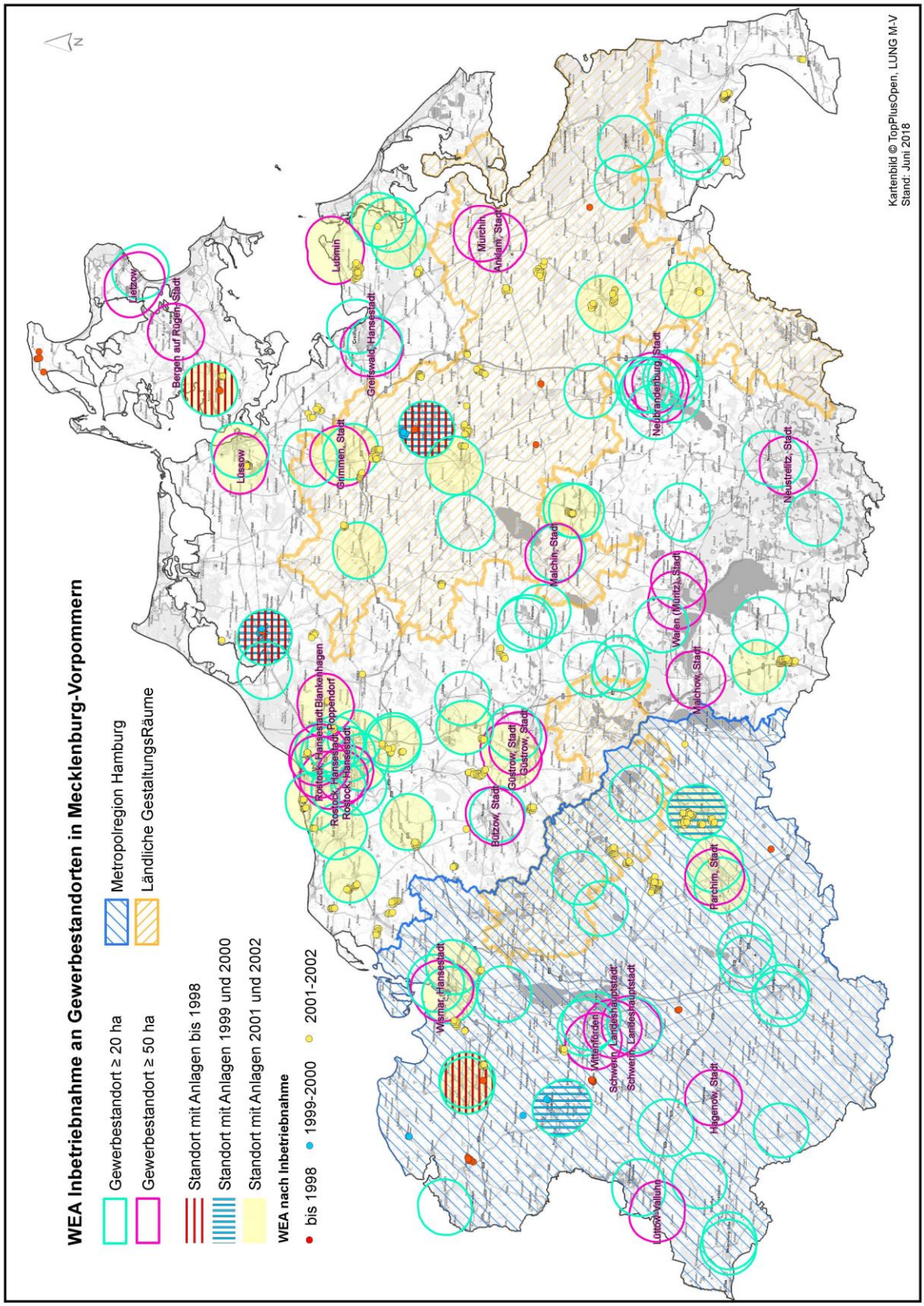

ANNEX 4: Bioenergy potential of industrial- and commercial areas in M-V