

BEA APP – Supporting the
implementation of the
Regional Energy Concept
Vorpommern
(Executive summary)

Ministry of Energy Infrastructure
and Digitalization Mecklenburg-
Vorpommern, PP1



Brief summary of the Regional Energy Concept Vorpommern

The Regional Energy Concept of the planning region Vorpommern was commissioned by the regional Planning Association Vorpommern. One aim of the concept is to cover 100% of all energy needs in the region by renewable energies in 2030 and to export renewable energies to other regions. The Regional Energy Concept comprise priorities and methods to achieve this goal.

The primary energy consumption in the region Vorpommern in the Year 2012 was around 37 PJ. Households represent the largest consumption sector. In the region a total potential of renewable energy of about 60 PJ was determined. Currently, less than 20% of this potential is used.

Potential analysis of the region, conducted in previous studies, revealed that:

- The regional potential for renewables energies clearly exceeds the current one as well as the expected future energy demand
- With an appropriate use of the existing renewable energy potential a complete (at least mathematically) self-supply with (renewable) energy is possible
- It is expected, that the self-supply with energy firstly in the electricity sector will be achieved
- For heat a self-supply of energy from the region is much more challenging - heat self-supply of the region could be achieved by an improvement of energy efficiency

The Regional Energy Concept includes also different strategies how to achieve the goal of 100% renewable energy in the planning region Vorpommern. The regional energy production strategy relies on a replacement of fossil fuels through renewable energies, on the use of technical innovation, on the expansion of the grid, on intelligent grid control as well as energy storage.

In addition, a biomass strategy is part of the concept, which suggests that the biomass, produced in the region, should be processed to higher value products for export.

A second strategy is the biofuel concept. It builds on the biomass strategy and suggests that biofuel production should be used in the regions to gain added value.

Implementation of the concept, supported by the BEA-APP project

By the end of 2015, the development of the Regional Energy Concept of Vorpommern was accomplished. Since then, implementation of the concept is being forced to change from fossil to renewable energy sources, to implement energy storage concepts, and to develop e-mobility as well as financial participation of the inhabitants in renewable energy projects in the region Vorpommern.

In the implementation process of the Regional Energy Concept Vorpommern three studies were carried out so far which tackle the topics district heating, storage systems and settlement structures.

The **study on district heating** included the analysis of the existing heating networks, of the consumption and production of heat in the planning region as well as the investigation of the integration of renewable energies in these heating networks. On that basis measures and recommendations for the regional planning were derived.

In the **study on energy storage systems** the spatial structure of energy distribution, the settlement structure and the conditions of digital and legal steering were evaluated with the aim to build a regional system of storages fitting to the area. Therefore, the energy balance 2015, the relation between energy production and consumption were analyzed on municipal level as well as the existing electricity and gas networks. Based on these analyses, a proposal for an energy balance 2030 were drawn (goal: reduction of electricity export and gas import). In addition, criteria and suggestions for the locations of energy storage systems were developed.

The most recent **study on settlement structures** focused on the analysis of possibilities to link the requirements of the energy transition with the spatial planning of settlement development. This is of central importance because in the planning region, single-family houses are high on resource, space and energy consumption compared to other types of housing. In addition, in the planning region of Vorpommern, the private sector plays a decisive role in energy consumption. To pave the way for the implementation of the Regional Energy Concept, an analysis of the development of the residential building structure in the municipalities and a typing of settlements in terms of their energy environment and comparison of municipalities was conducted. In addition, an analysis of the interactions between settlement structure development, energy consumption and energy supply against the background of the energy transition was carried out. Requirement for the development of future settlement areas, particularly with regard to the heat supply with open-space solar thermal energy, geothermal energy and bioenergy were also tackled. In the context, the transferability to the other countries around the Baltic Sea was examined taking into account the general planning criteria developed in the BEA-APP project.

General planning criteria used in the implementation process

Spatial planning is a key instrument for establishing long-term frameworks for social, territorial and economic development both within and between countries of the Baltic Sea Region (BSR). In the BEA-APP project, the partnership developed a commonly agreed set of general spatial planning criteria for furthering the production and use of renewable energy in the participating regions.

In the BSR there are increasingly complex social, economic, technological, and environmental factors that are present in planning. In addition, planning processes and planning criteria as well as management and prevention of conflicts often go together.

The general planning criteria represent framework conditions for the implementation of renewable energy installations in the BSR. These central aspects comprise the thematic fields planning, society and economy as well as crosscutting aspects.

The developed general spatial planning criteria are taken into account in the spatial planning for renewable energy in Mecklenburg-Vorpommern and respectively in the implementation process of the Regional Energy Concept Vorpommern as follows.

Planning

Spatial planning in Mecklenburg-Vorpommern is cross sectoral and balances economic, social and environmental aspects and demands in the field of spatial development. Furthermore, spatial planning contributes to the prevention and solution of conflicts.

1. Aspect: Designated areas for renewable energies

Specific areas are designated for renewable energy especially for wind turbines in Mecklenburg-Vorpommern: At the beginning of the planning process, it is considered where wind turbines should not be allowed and where they cannot be excluded but only be permitted after careful examination in order to avoid disturbances and disruptions caused by wind turbines as early as possible. This results in a list of criteria for the area selection. The first group are the exclusion criteria ("here under no circumstances") and the second group are the restriction criteria ("carefully considered in individual cases"). The list of criteria is prepared by the State Spatial Planning- and Nature Conservation Authorities. The Ministry of Energy, Infrastructure and Digitalization Mecklenburg-Vorpommern suggests these criteria as a recommendation to the four Regional Planning Associations. The Regional Planning Associations designate areas suitable for wind energy in the Regional Spatial Development Programmes based on these criteria and on the basic principles included in the State Spatial Development Programme Mecklenburg-Vorpommern.

2. Aspect: Standard planning processes

In Germany, spatial planning is carried out at national, regional and municipal level. The spatial planning processes are standardized and in force for specific sizes and types of renewable energy installations and define the need for public participation, the legislative framework and authorities in charge.

Society and Economy

The social acceptance of renewable energy installations is essential for the success of the energy transition. In order to ensure a high level of local acceptance, an early participation of affected citizens and communities is indispensable. Public participation in the context of renewable energy projects can be organized differently. In particular, a distinction must be made between financial participation in the revenues of the renewable energy plants and participation in their planning process.

3. Aspect: Models for participation in spatial planning

Numerous participation models are in force and are considered for the spatial planning for renewable energy in Mecklenburg-Vorpommern. One form of participation is the public participation in spatial planning which can be distinguish in Germany between formal participation procedure, that is regulated by law, and informal, flexibly designed by the actors. In Mecklenburg-Vorpommern, citizens are involved in the development and implementation of local and regional energy concepts and also in the planning process of individual renewable energy plants.

4. Aspect: Economic participation models

Economic participation can be achieved in the context of participation in regional energy cooperatives, community wind farms and solar parks and other formats. The socio-economic benefits can help to change local people's perception of the establishment of renewable

technologies. The goal is to increase local benefits for affected people from the added value of energy production. In addition to these widespread participation opportunities in the BSR, the federal state government of Mecklenburg-Vorpommern has created a legal option for the financial participation in wind turbines with Citizens' and Community Participation Act M-V. It obliges wind project developers to set up a company and to offer up to 20 % of the shares in the project to the neighbouring citizen or the community in their area. The maximum price of a business share is limited to 500 euros. A second possibility for the project developer is to offer the municipalities within a radius of 5 km an annual compensatory levy as an alternative form of participation. This not only involves new wind energy projects, but also repowering projects. Finally, there are other options such as a cheaper local electricity tariff or a savings product with reduced financial risk such as savings bonds or fixed-term deposits.

Other and crosscutting aspects

Besides the thematic areas of planning, society and economy the general planning criteria also refer to cross-sectional aspects which are taken into account in the realisation of plants for the use of renewable energy in Mecklenburg-Vorpommern.

5. Aspect: Natural renewable energy resources

Due to the fact that the renewable energy resource availability differs throughout the different states in Germany and, for variable resources and in relation to time, the natural renewable energy resources are evaluated by the use of renewable energy resource data sets providing information on e.g. feedstocks for bio-energy (e.g. crop or forestry residues), the characteristics of solar energy (e.g. irradiance, ground measurements) and wind energy (e.g. wind speeds, power density, ground measurements) in Mecklenburg-Vorpommern.

6. Aspect: Grid capacity

Renewable energy production from wind and solar are subject to natural variability. This variability creates distinct challenges to integrate the generated power into larger power systems and grids. The integration of renewable energy is a multilayer-challenge involving multiple decision-makers like energy storage resources, grid operators, energy market operators and transmission planning bodies. Therefore, a consideration of the grid capacity is a general aspect for the planning of renewable energy in Mecklenburg-Vorpommern

7. Aspect: Capacity and height of installations

In Germany, especially in the context of wind energy, the height of the turbines is a central aspect in the planning process. Capacity for power generation plays an important role for the establishment of bioenergy plants and solar power plants.

8. Aspect: Conflict potential

Conflicts related to renewable energy installations occur in all participating regions around the Baltic Sea. In Mecklenburg-Vorpommern, bioenergy is often associated with conflicts regarding air quality and noise protection. In the framework of wind energy, conflicts about the designation of suitable areas have increased in recent years. The conflicts also comprise environmental conflicts, caused by the influence on avifauna and species protection, and landscape conflicts caused by the impact on cultural landscape and nature values. In addition, the noise, blinking and shadowing of wind turbines are conflicting. For this reason, a multilayer, interdisciplinary conflict assessment to evaluate the conflict potentials for new renewable energy installations is necessary in the course of spatial planning in Mecklenburg-Vorpommern.