



*Sharing solutions for
better regional policies*



IRENES
Interreg Europe



**KLIMASCHUTZ
AGENTUR**
REGION HANNOVER



iup Institut für Umweltplanung





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Introduction

This Action Plan is developed within the Interreg Europe project IRENES that will put in place interregional knowledge and experience exchange process to identify gaps and barriers within current ERDF and energy policy instruments in relation to the Renewable Energy Sources (RES) and Ecosystem Services (ES) co-relation, including environmental, social, economic, and governance concerns.

The Millennium Ecosystem Assessment (2005), and recently the EU 2020 Biodiversity Strategy emphasizes that human well-being is tightly linked to environmental conditions through the delivery of ES, and therefore good territorial environmental management could, in principle, also deliver better outcomes for people and environment, resulting in win-win solutions. Low-carbon policies and RES development are challenged by the complexity of linkages between ecological, physical, social, and economic factors in relation to trade-offs and synergies between RES exploitation and the delivery of multiple ES. Generalizations and knowledge shortage lead to missing the acknowledgement of potential synergies between RES and ES within the governance and policy frameworks at territorial level.

The active commitment of Structural Funds Managing Authorities, and governing bodies of other policy instruments addressed in the project, was of paramount importance to integrate the potential RES development trade-offs and co-benefits with ES into the territorial development policies. Therefore, IRENES consortium priority was to communicate and dialogue with policy makers in order to trigger the knowledge transfer and to inform the decision makers about the potential of a win-win outcome that can be incorporated into the regional and national ERDF Operational programmes, energy and climate strategies and laws.

The main outputs of IRENES are the five action plans to improve regional and national structural funds programmes and other environmental and energy policies related to the use of renewable energy and ecosystem services.

In the interregional exchange, State Of The Art analyses (SOTA) and SWOT analyses of the policy target instruments were carried out as a basis for this, providing an overview of the state of knowledge. In this way, maps of trade-offs and synergies between the use of renewable energies and ES were created for each case study. The planned interregional field visits with in-depth peer review sessions were conducted online and allowed for an intensive exchange on methodologies and best practice projects.

IRENES knowledge accelerators (IKA) were introduced in each region to guide interregional and local experience sharing and policy learning through shared learning and participatory activities for stakeholders, e.g. in the form of capacity building workshops, job shadowing exchanges and role play simulations with several hundred stakeholders in total.

Portrait of Lower Saxony

Lower Saxony is the second largest of the 16 federal states of Germany. Around 8 million people live in 971 towns and municipalities. The importance of renewable energies for energy supply is continuously increasing in Germany and Lower Saxony. At 96 % in 2019, the share of renewable energy sources in gross electricity generation in Lower Saxony has reached its highest level up to now. Over 53 billion kWh of electricity was generated from renewables in 2020 (MU Nds., 2021). Wind power generation in particular increased sharply in Lower Saxony in 2020 and accounted for 75 % of total gross electricity generation from renewable energy sources. The shares of biomass (around 20 %) and photovoltaics (6.5 %) regress slightly compared to the previous year. Hydropower plays only a minor role in electricity generation (MU Nds., 2020).

In recent years, the use of wind energy in Germany has also picked up considerably at sea. In 2019, a total of around 7,516 MW of offshore wind power was connected to the grid, 60 percent of this is via Lower Saxony. By 2020, the installed capacity is expected to rise to up to 7,700 MW. (MU Nds., 2020)

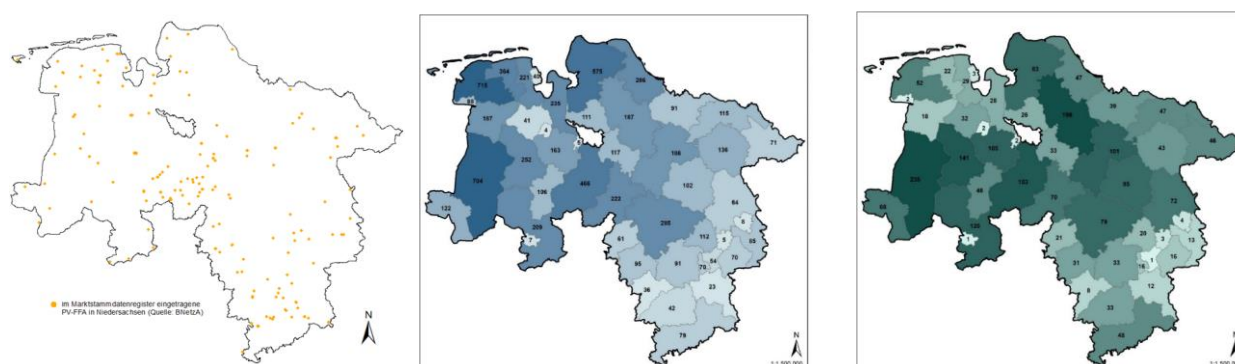


Figure 1: solar parks registered in Lower Saxony; Number of Wind Energy Plants per County in Lower Saxony; Number of Biogas Plants per County in Lower Saxony (Source: (Bundesnetzagentur, 2022))

At the end of 2018, 1,662 biogas plants (mainly agricultural) were in operation in Lower Saxony. (3N, 2019) 97 % (1,608 plants) of biogas plants were operated with renewable raw materials in 2018. The cultivation of energy crops for biogas in Lower Saxony takes up 282,000 ha (about 10.7 % of the agricultural area), of which 267,000 ha are arable crops and about 16,000 ha grassland. Among the arable crops, maize accounts for the largest share (85 %) with 227,000 ha. In areas with high biogas and livestock density, the increasing cultivation of maize for biogas production and livestock farming means that in some communities maize accounts for almost 50 % of the arable land. (3N, 2019)

The continued cultivation of energy crops has led to high nutrient surpluses in the region due to the additional accumulation of fermentation residues, and thus to further pollution of nature and especially of groundwater. The use of energy crops - such as maize - is to be significantly reduced. As a contribution to climate protection, the state government is committed to increasing the use of liquid manure as a substrate in future (MU Nds., 2017a).



Photovoltaics (PV) ranks third among the renewable energies in Lower Saxony in terms of electricity generation. The total installed PV capacity in 2018 was around 3,890 MW (MU Nds., 2020). The share of solar park systems is only 14.5 % (AEE, 2020). In 2017, heat generation via solar thermal energy in Lower Saxony amounted to 635 million kWh (MU Nds., 2020).

Part I – General information

Project: IRENES (Integrating RENewable energy and Ecosystem Services in environmental and energy policies)

Partner organisation(s) concerned: Leibniz University Hannover & Climate Protection Agency of Hannover Region

Country: Germany

NUTS2 region: Lower Saxony

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Part II – Policy context

The Action Plan aims to impact to the following Program:

Lower Saxony State Spatial Planning Programme (LROP)

Background

At the beginning of the IRENES project, the Operational Programme of the period 2014-2021 applied and was analysed by the project team according to the interregional agreed SWOT analysis methodology and the IRENES stakeholders.

The strengths of the Operational Programme for Lower Saxony, with regard to the project objective of IRENES, are, first of all, that the thematic field of ecosystem services is already mentioned and also taken up in the funding guidelines. This is generally a very positive development. However, the deeper analysis in the project shows that the Operational Programme is rather oriented towards economic aspects of regional development than towards nature conservation. For example, the funding guidelines do not aim to achieve an optimal spatial distribution for the use of ecosystem services in Lower Saxony. Although there are delimited areas based on spatial criteria in which the funding guideline applies, their boundaries are oriented only to economic values, not to the distribution of ecosystem services in the region. Neither the current nor the future Operational Programme make references to the existing state government documents on ecosystem services, which would provide information on spatial priorities for the expansion of production.

Part of the SWOT analysis was an external coherence analysis. For that, the programmatic framework of each Policy Instrument for each Region was drawn up, considering plans, programs and policies that consider or address ecosystem services and renewable energies.

In Germany, the energy transition is primarily financed by the Renewable Energy Sources Act (EEG), which applies nationwide. This instrument defines development and expansion targets, differentiated according to the various energy sources. However, it does not make any statements on human- and nature-friendly spatial management, so that the EEG cannot be used to control the spatial impacts of wind or solar energy. In addition, the planning procedures for each energy source are carried out by different actors and there is no overall concept of specialised energy planning.

We found out, that the main actors of the energy transition in Lower Saxony are at other governance levels and in other ministries than those responsible for the development of the OP. The Ministry of the Environment, Energy, Construction and Climate Protection formulates the targets for the expansion of renewable energies,



the Lower Saxony Ministry of Food, Agriculture and Consumer Protection is responsible for spatial planning and thus for the overall planning of the locations of generation plants.

Support of the LROP revision in the first phase of IRENES until July 2022

One of the core instruments for the energy transition is the Lower Saxony Spatial Planning Programme (LROP), which applies to all regions within Lower Saxony. The current LROP dates from 2017. It mainly makes statements on wind energy: potential areas are identified in the state spatial planning programme and regional expansion targets are defined. These specifications are then concretised by regional planning and adopted in communal urban land use planning (see Fig. 2). With binding statements on spatially significant uses (settlement, transport routes, raw material extraction, energy, etc.) and their development, the LROP serves to coordinate the often conflicting economic, social, cultural and ecological interests in one area. It thus represents the planning concept for a sustainable land development.

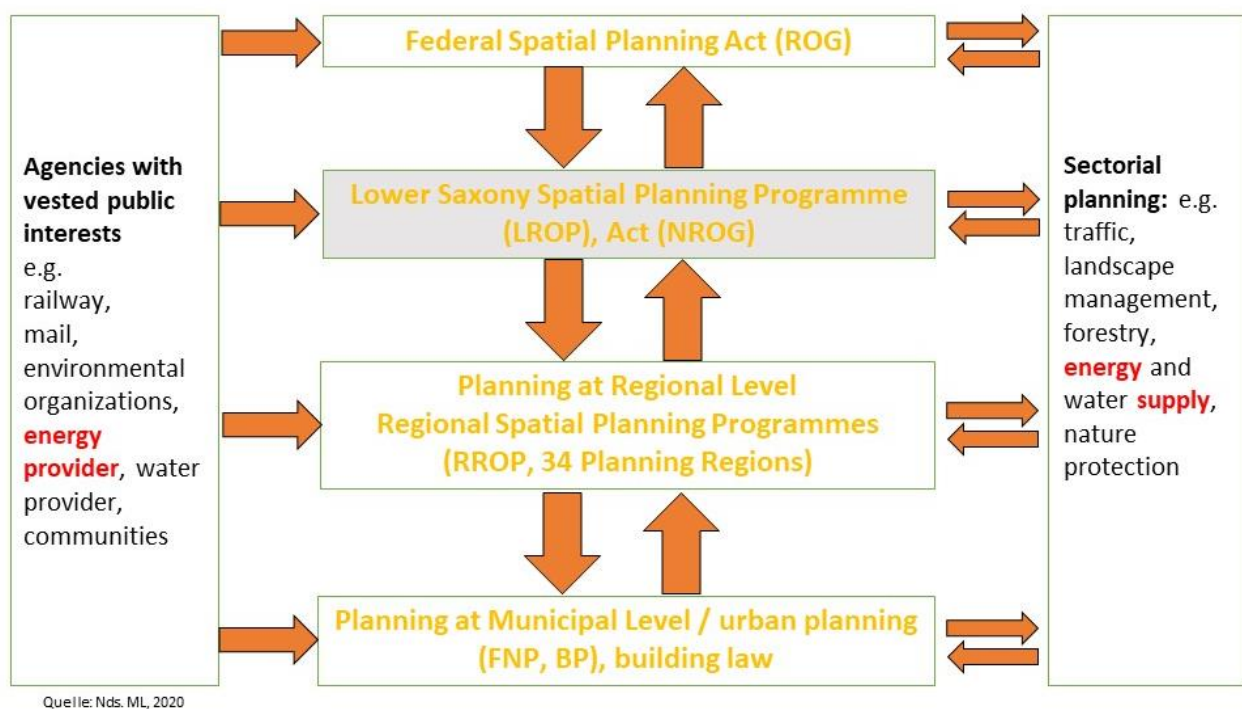


Figure 2: Spatial Planning System in Germany/Lower Saxony and Overview on Regulation (source: ML 2020)

The Lower Saxony Spatial Planning Programme (LROP), as well as the Wind Energy Decree play a central role for the nature compatible expansion of wind energy (see Fig. 3). The Wind Energy Decree makes spatially non-specific specifications for the planning and approval of wind energy plants in Lower Saxony. It is binding for the authorities in the municipalities, insofar as they are involved in the approval and monitoring of wind turbines. For the regions, it serves as a guideline for consultation with other land uses.



The Regional Planning Programme of Lower Saxony (LROP) also contains objectives and principles on the planning of spatially significant sites for wind energy and makes statements on the spatial distribution of energy production. The objectives of the LROP must be observed by the regional planning authorities.

Both documents set targets for the regions in terms of generation quantities and spatial distribution of wind turbines. In contrast, solar energy, including the construction of solar parks, is planned by municipal planning authorities (see Fig. 3). The regional planning system does not make any specifications for this energy source. Thus, there is currently no decision-making level that would bundle the expansion of all available energy sources. A bundled planning of renewable energies would allow a holistic energy transition that takes into consideration the trade-offs and synergies with the different renewable energies as well as ecosystem services.

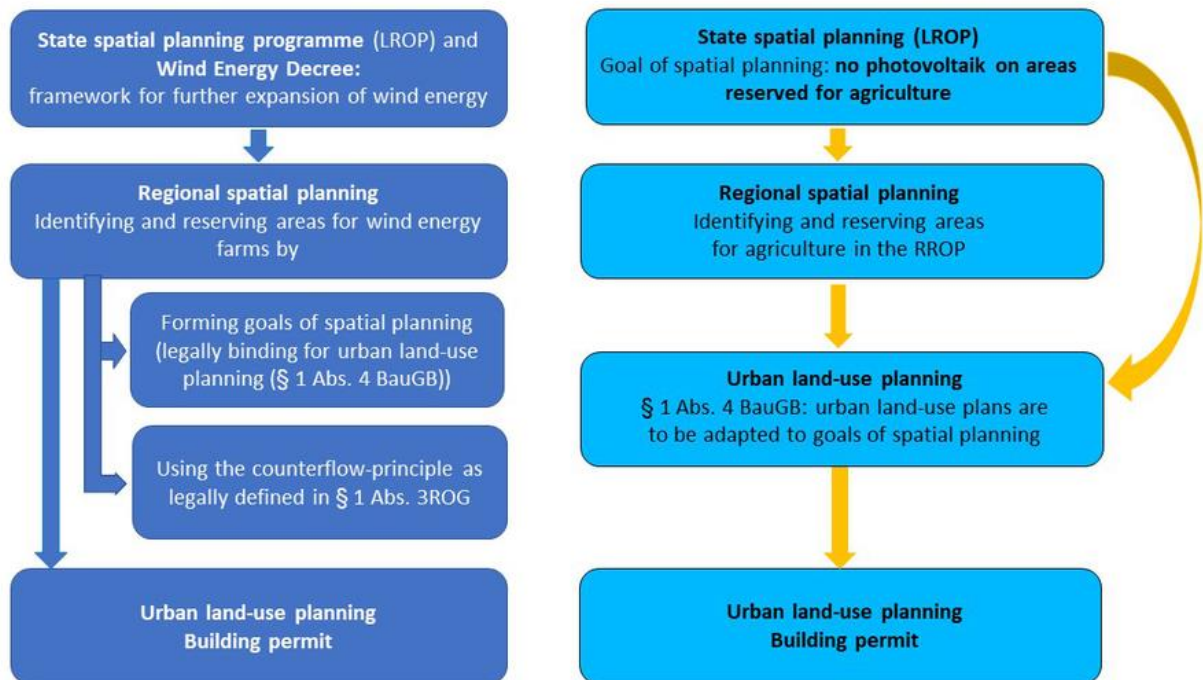


Figure 3: Planning of wind and solar energy in Lower Saxony according to the LROP 2017.



The LROP 2017 is currently being revised and in particular, the chapter on energy supply is being adapted to the current situation and the requirements of the energy transition targets. The amendment procedure of the new LROP began in November 2019 with the announcement of the general planning intentions (see Fig. 4). At the beginning of 2021, there was an opportunity for the IRENES-Team to comment on a first draft of the amendment ordinance. We have used the chance and handed in an official statement to the first draft, where we have proposed the following:

- The restrictions on solar parks shall be lifted so that the municipalities have more suitable areas for manoeuvre.
- In line with the results of the IRENES project, a nature-friendly design of the solar parks shall be included.
- We have also proposed amendments in the area of wind energy use. These related to the opening of the usable area to a possible wind energy expansion in the forest.

In the meantime, based on the comments on the first draft, a second draft ordinance on the planned amendments to the LROP has been prepared with a justification of the amendments and an environmental report describing and assessing the likely significant effects on the environment. On 30 November 2021, the Cabinet released this revised draft Amendment Ordinance.

From 03.01.2022-24.01.2022, the draft documents were publicly displayed at the Ministry in Hanover. In addition, the documents were made available from 03.01.2022 on the internet platform for the participation procedure with the possibility to submit comments. From the beginning of the display period until 31 January 2022, public bodies, associations and organisations as well as the public had the opportunity to submit comments on the amendments to the first draft, including the explanatory memorandum and the environmental report. Again, we took the chance and handed in an official statement to the second draft, the explanatory memorandum and the environmental report. We have commented following points:

- We supported the change that compared to the first version of the LROP, the usable area for solar energy has been significantly expanded.
- We supported that in the environmental report our calculated needed installed solar power for Lower Saxony was basis for the LROPs underlying expansion targets.
- We supported the recommendation to create regional energy concepts because they will help municipalities to deal with the issue of energy transition and to draw up implementation plans.

Due to the COVID 19 pandemic, a discussion as a face-to-face event was dispensed. Instead, the discussion was replaced by a video conference. This video conference took place from 28.03.-30.03.2022. The Lower Saxony IRENES team took part in the video conference.

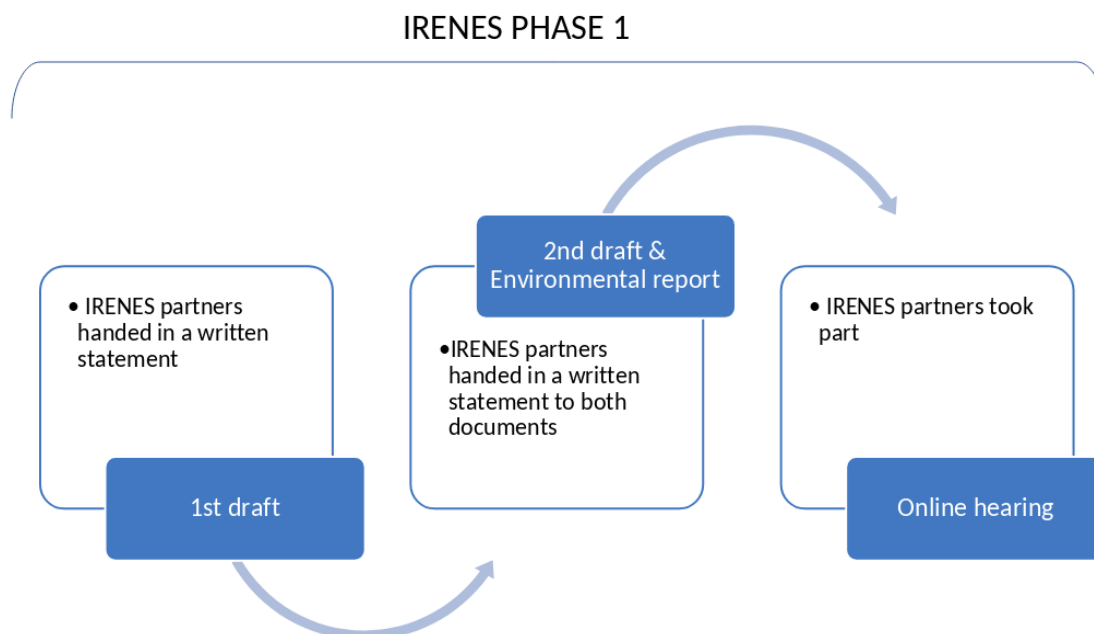


Figure 4: Action started in phase 1

Lessons learnt from interregional exchange

One part of the IRENES project was the interregional knowledge and experience exchange process. This part of the project was very helpful for our regional work and stakeholder engagement process.

The project partner from Estonia, the Estonian Environmental Agency and the Estonian University of Life Sciences, have produced a communication and engagement tool in order to disseminate the results generated in the IRENES project. They developed digital data on the possible expansion of wind energy and made it available to stakeholders (also see PR 1 2021; PR 2 2021). They also published the tool on an ArcMap-based storytelling app that displays all the maps produced within IRENES, alongside with explanatory texts on the potential applications of the maps (Keskonnaagentuur 2021). This also encourages us to use the geodata for discussions with local decision-makers. Within the framework of the research repository of Leibniz University of Hannover, we were able to publish them and make them accessible to the planning authorities.¹ The responsible policy makers of the LROP also work with maps, so maps are a familiar communication tool for them. Therefore, it is very helpful to explain the objectives and findings of IRENES. With the help of the maps, it is possible to quickly visualise which connections must be taken into account when linking renewable energies and ecosystem services, and how their distribution varies in the regions. On this basis, the policy learned to make well-founded statements about suitable locations for energy production that will be part of the LROP.

¹ <https://data.uni-hannover.de/dataset/dataset-areas-with-low-and-medium-spatial-vulnerability-to-a-prototype-wind-turbine>
<https://data.uni-hannover.de/dataset/areas-in-lower-saxony-with-low-and-medium-spatial-vulnerability-to-ground-mounted-photovoltaics>



Part III – Details of the actions envisaged

ACTION: Inclusion of IRENES results of the combination of ecosystem services and renewable energies in the new Lower Saxony State Spatial Planning Programme (LROP)

Relevance of the action

The state spatial planning program is the central instrument for spatial planning in Lower Saxony. It is here that the planning specifications for the regions are made. In the previous LROP, the expansion of ground-mounted solar energy is severely limited in Lower Saxony. Solar parks are a cheap and fast way to produce renewable energy and reduce carbon emissions. In addition, as IRENES demonstrated, it is possible to increase biodiversity and other ecosystem services with solar parks.

Action

During Phase 1 of the IRENES project, we carried out potential calculations and analyses on how to design an energy transition that is compatible with human well-being and nature (e.g. IRENES-SWOT, IRENES-SOTA, RES&ES potential maps). Furthermore, we collected best practices with the IRENES partners that are inspirational for Lower Saxony. As mentioned before, we have participated in the first participation phases of the LROP, discussed the contents with partners and IKA afterwards, and handed in official statements to the LROP drafts.

The following planned changes in the new LROP are made possible due to our effort and support in phase 1 of IRENES:

- Suitable forests can be used for wind energy in accordance with the Federal Nature Conversation Act.
- Solar parks can be used on agriculturally used and undeveloped areas.
- Agricultural photovoltaic can be installed.
- Regional energy concepts are to be developed.

The new LROP will connect wind and solar planning within regional energy concepts. This is the first step towards bundling the planning of renewable energies. This would allow a holistic energy transition that takes



into consideration the trade-offs and synergies with the different renewable energies as well as ecosystem services.

The Lower Saxon Ministry for Agriculture will work over the summer 2022 to complete the new and final LROP and integrate all feedback received during the participation phase. In addition, the ministry will publish a guideline on developing regional energy concepts for municipalities.

The IRENES partner will submit the IRENES results in the form of texts and maps (IRENES-SWOT, IRENES-SOTA, RES&ES potential maps) to the ministry to aid drawing up the guideline on developing regional energy concepts for municipalities. Our results will be recommended to the ministry as basis for the proposed regional energy concepts. This will help them reach their target achievement.

Once the final LROP is published, the State Parliament will be given the opportunity to comment. Afterwards, the State Government will adopt the final LROP version and publicities it in the Ministry Journal. When the new LROP is valid, the regional planning bodies will change their regional plans according to the LROP. The Lower Saxony Ministry of Food, Agriculture and Consumer Protection will approve the new regional plans.

During the evaluation phase, the IRENES partners will participate in shaping the new instrument of regional energy concepts. We will develop criteria with which monitoring is possible and the implementation of the energy transition can be examined at regional level. This evaluation, based on the principle of a strengths and weaknesses analysis, can be used to derive improvement potentials and ice-breakers for the new instrument. The results will be submitted in the form of a report to the partners in the responsible ministries (environment and agriculture).

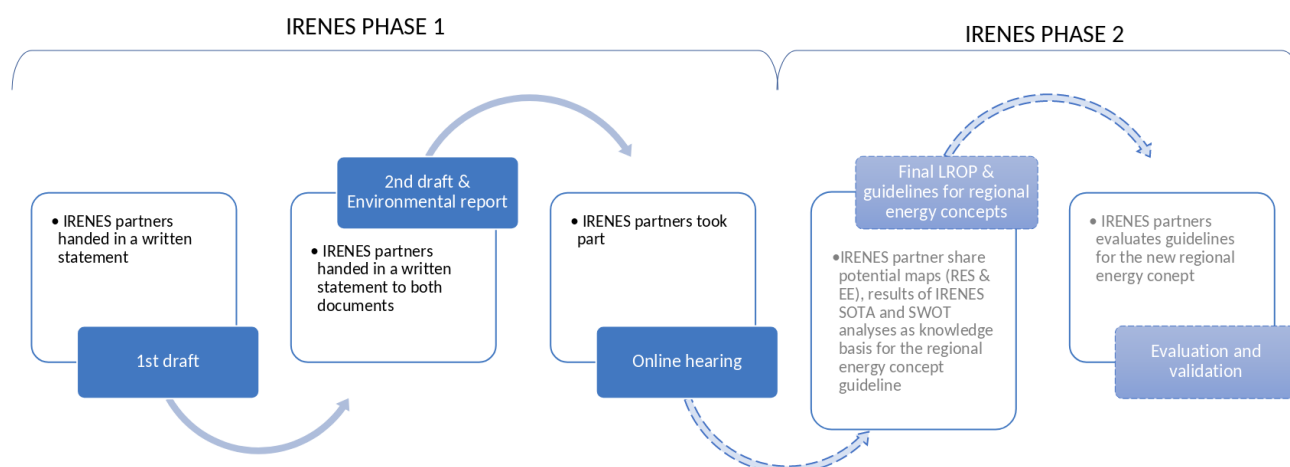


Figure 5: overview of action in phase 1 and phase 2



Timeframe

The timeframe for this action can be summarized as following:

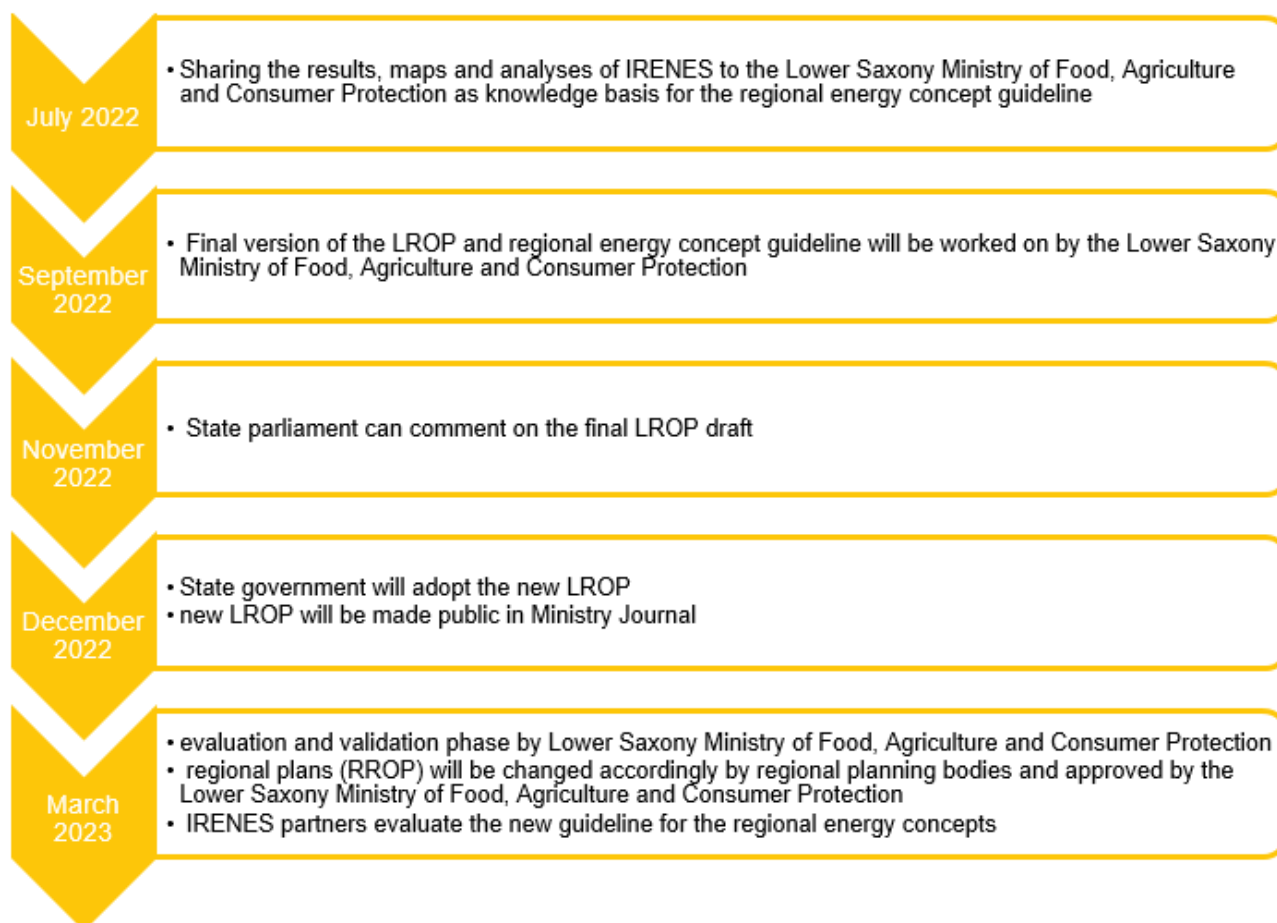


Figure 6: Timeframe of the planned action

Stakeholders involved

The main implementation partners of the action are:

- Climate Protection Agency Hannover Region gGmbH (practical partner)
- Leibniz University Hannover, Institute for Environmental Planning (scientific partner)
- Lower Saxony Ministry of Food, Agriculture and Consumer Protection; Department 303 - Spatial Planning and Land Use Planning



Costs

The costs for this action are mainly staff costs for evaluating the process.

Funding sources

The costs for the action will be covered mostly of the lump sum and will be supplemented with internal funding.

Expected results

The results of the analysis done in the IRENES project will be incorporated in the new version of the LROP and the guidelines for regional energy concepts. Furthermore, it is expected that the new LROP will be approved and adopted within the end of this year. The amended LROP will thus support the design of an environmentally sound energy transition towards a better linkage of renewable energies and ecosystem services. Concrete expansion targets and area potential analyses are an important support for regional and municipal planning.

The new LROP is a step in the direction of bundling renewable energy expansion with the new regional energy concepts. Thereby, Lower Saxony will close the gap that was identified within IRENES.



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