

A Framework for State-Level Levers for Climate Mitigation: The Case of Wind Energy Expansion in Baden-Württemberg

Bachelor thesis

submitted in partial fulfillment of the requirements

to obtain the academic degree of

Bachelor of Science

in Liberal Arts and Sciences

at the University College Freiburg

of the University of Freiburg

submitted by

First and Last Name: Greta Marie Waltenberg

Matriculation Number: 5301653

Majoring in: Environmental and Sustainability Sciences

First examiner (supervisor): Prof. Dr. Dierk Bauknecht

Second examiner: Prof. Dr. Tanja Mölders

Word count: 11,899

Date of submission: 18/03/2026

Abstract

Subnational governments play an important role in climate governance. Accordingly, German states retain certain opportunities to shape climate mitigation policies. However, the range of these state-level policy levers remain insufficiently systematised in existing research. This thesis therefore develops a conceptual framework for analysing state-level levers for climate change mitigation and applies it to the case of wind energy expansion in Baden-Württemberg.

The study combines literature research, an analysis of Baden-Württemberg's climate action register with four expert interviews with representatives from academia, state administration, and the renewable energy sector.

The analysis shows that while many wind energy projects in Baden-Württemberg are currently planned or approved, a gap remains between project development and actual implementation. Expert interviews indicate that economic framework conditions currently represent the most decisive factor for project realisation. The main factor for this is the national Renewable Energy Sources Act (EEG). Nevertheless, the state retains important levers in areas such as leasing state-owned forest, potentially providing financial support, administrative procedures, spatial planning, and public communication.

The thesis concludes that although key economic conditions for renewable energy expansion are determined at higher governance levels, state governments play a crucial role in shaping the institutional, administrative, and spatial conditions for project implementation.

The conceptual framework developed in this study proves to be a useful tool for analysing state-level opportunities and may support further research on subnational climate governance.

I hereby declare that I am the sole author and composer of my bachelor thesis and that no other sources or learning aids, other than those listed, have been used. Furthermore, I declare that I have acknowledged the work of others by providing detailed references of said work.

I hereby also declare, that my bachelor thesis has not been prepared for another examination or assignment, either wholly or excerpts thereof.

I declare that the submitted electronic version of the bachelor thesis corresponds in content and formatting to the hard copy.

Place, date

Signature

Table of Contents

List of Figures	iv
List of Appendices.....	iv
1. Introduction	1
2. Methodology	3
2.1 Developing a Framework for States' Scope of Action	3
2.2 Case Study on Wind Energy in Baden-Württemberg	5
3. Background: Federalism and climate governance	7
3.1 General Distribution of Competences and Resources	7
3.2 Interactions and Coordination between the national and state level.....	8
3.3 Climate Governance in the Context of the German Federal System	9
3.4 Existing Frameworks of States' Opportunities for Climate Mitigation	10
4. Developing a Framework for State-Level Levers for Climate Mitigation	12
4.1 Table of Current and Potential Measures in Baden-Württemberg.....	12
4.2 Framework of State Policy Levers for Climate Mitigation.....	18
6. Case Study: Wind Energy Expansion in Baden-Württemberg.....	22
6.1 Targets and Status Quo of Wind Energy Expansion in Baden-Württemberg	22
6.2 Building a Wind Turbine in Baden-Württemberg: Actors, Framework Conditions and Process	23
6.3 State-Level Paths of Influence	25
6.4 Evaluation and Priority Measures.....	34
7. Discussion	36
8. Conclusion & Outlook	37
References	38

List of Figures

1. Overview of the Methodological Steps of the Study	3
2. Core Principles of Legislative Competences in the German Federal System	7
3. Overview of State and Municipal Opportunities to Promote Renewable Energy	10
4. States' Scope for Action Regarding the Development of Climate Protection Instruments and Measures	11
5. Key Characteristics of State-Level Climate Policy Measures	12
6. Distribution of Characteristics of Climate Policy Measures Implemented by Baden- Württemberg.....	16
7. State Policy Levers to Promote Climate Mitigation	18
8. Overview of Governance Levels and Public Actors Involved in Wind Energy Expansion	23
9. Evaluations of wind energy expansion in Baden-Württemberg by experts	34

List of Appendices

A. Table of Current and Potential Measures in Baden-Württemberg	42
B. Descriptive Statistics of Current and Potential Measures in Baden-Württemberg ..	58

1. Introduction

The recent state election in Baden-Württemberg in combination with the projection that the state will miss its 2030 emission reduction target by 17% (Steinbach et al. 2024) pose the question of the role of state governments in advancing climate mitigation. In particular, questions arise regarding which policy instruments are available to the state, how effectively they can be implemented, and where constraints imposed by national or European legislation limit action. Despite the importance of climate policy at the subnational level, there is a lack of systematic, instructive frameworks that allow for a structured analysis of state-level levers for climate action. This thesis seeks to address this gap by developing a conceptual framework of state policy levers and applying it to the case of wind energy expansion in Baden-Württemberg to answer the question of actionable steps for Baden-Württemberg to further climate mitigation.

The German federal system and its legal and institutional structures shape the possibilities for state-level action. While EU and federal targets, regulations, and funding streams provide an overarching framework, the states retain some space to design and implement climate policies tailored to regional circumstances (Eckersley et al. 2021; Schmidt et al. 2022). The national Climate Action Act explicitly allows for state-level climate protection laws, particularly where such initiatives already exist, highlighting the potential, albeit limited, scope for subnational action. This thesis therefore asks: Given these legal and constitutional constraints, what opportunities do German states have to advance climate mitigation, particularly in the energy sector?

The study is guided by several research questions: What role do state-level political instruments play in Baden-Württemberg's energy transition? Which political instruments and legal limitations define the state's capacity to influence the energy transition? To what extent does Baden-Württemberg make use of these instruments, and which opportunities remain underutilized? Given the scope of this work, wind energy expansion serves as a focused case study to explore these questions in depth. Specific sub-questions include: Which measures have proven most effective in promoting wind energy development? How do administrative, economic, and public acceptance factors influence project realisation? How can the state accelerate wind expansion under the constraints of national and international law?

Wind energy in Baden-Württemberg was chosen as a case study due to several reasons. The provision of renewable electricity is a central component of climate mitigation, and the expansion of wind energy has gained increasing political and economic significance in times of fluctuating energy prices and growing concerns about energy security. Wind power in Baden-Württemberg is considered essential not only for meeting national and state-level climate targets, but also for ensuring system complementarity, maintaining security of supply, and supporting distributive justice within the German energy system (Schmidt et al. 2025). Yet, wind energy development in this state remains lagging: Only

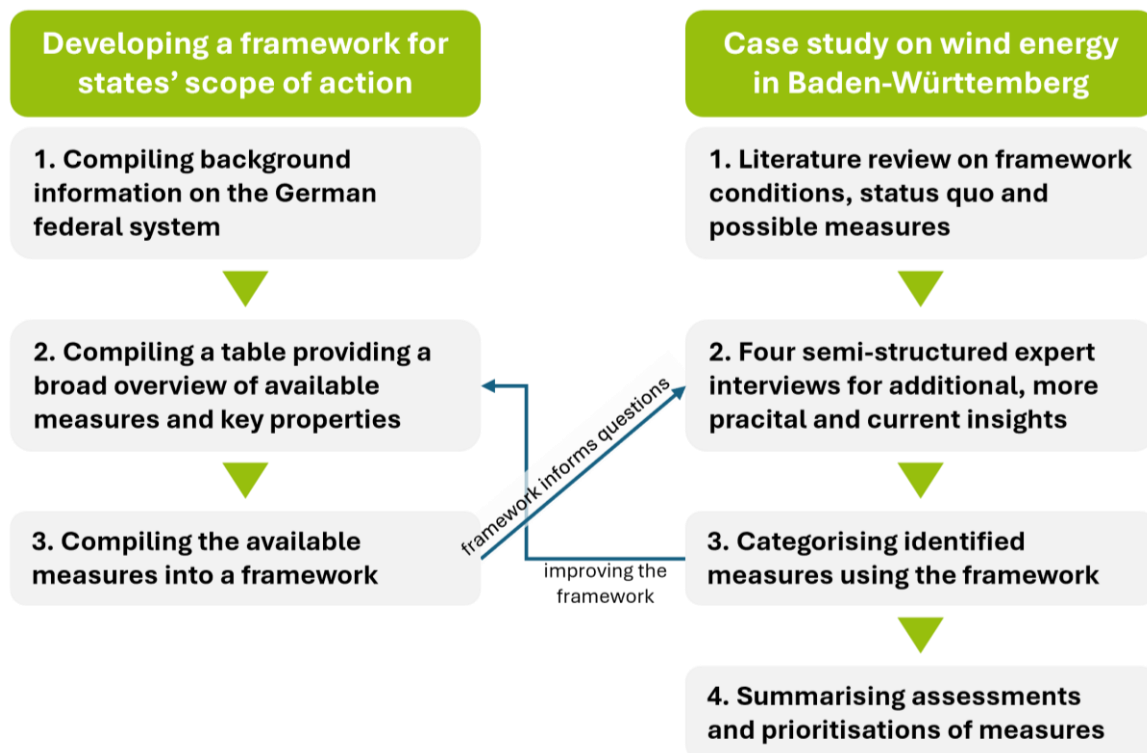
around one third of the capacity required to meet the 2030 wind energy target has been installed (LUBW 2026). This gap between policy objectives and actual deployment makes wind energy an ideal lens for analysing the opportunities, constraints, and practical levers available to the state.

To address these questions, the thesis combines literature research, analysis of the state climate action register (KMR), and expert interviews. By focusing not on theoretical legal constraints but on measures already implemented by the state or explicitly recommended by experts the thesis provides actionable insights into how state governments can shape climate mitigation within their spheres of influence.

The findings suggest that, currently, economic factors build the bottleneck for wind energy expansion in Baden-Württemberg. These are largely determined at the national level but, potentially, the state could also provide financial support. However, investigating to what extent this is possible under state aid law lies beyond the scope of this work as no uniform expert assessment could be identified. Additionally, however, the state can further improve project outcomes through the improvement of administrative processes, benevolent standardisation of permission guidelines, and public communication. The framework developed in this thesis proves useful for structuring such analyses and offers a foundation for assessing and comparing potential state-level interventions in the energy transition when complemented with the legal and institutional framework conditions of the respective policy field.

2. Methodology

Figure 1: Overview of the Methodological Steps of the Study



Source: Own Illustration.

2.1 Developing a Framework for States' Scope of Action

1. Compiling Background Information on the German Federal System

The first step of this study was to provide an overview of the distribution of competences within the German federal system, particularly regarding climate mitigation. This was achieved through a review of relevant academic literature and existing conceptualisations of state-level policy levers in climate governance, as well as an analysis of the key principles of the German Basic Law. The literature review was conducted using academic databases such as Google Scholar, publications by governmental institutions and research organisations as well as the references in publications found in this way. Search terms included combinations of keywords such as “climate governance”, “German federalism”, “subnational climate policy”, “state climate policy”, “wind energy expansion Germany”, and “Baden-Württemberg renewable energy policy” both in German and in English. Particular attention was given to recent publications (primarily from 2020 onwards) to capture most current developments in climate governance, while earlier foundational works were included where necessary to explain institutional structures. The selection of literature focused primarily on peer-reviewed academic publications, official policy reports and studies by recognised research institutions.

2. Compiling a Table Providing a Broad Overview of Available Measures and Key Properties

It is hardly possible to develop a comprehensive and stable overview of all climate mitigation measures that are theoretically available to the states. Legally, it would only be possible to compile a list of measures that are not available to the states. To identify measures that are realistically available to the states, this study therefore adopts a more instructive approach: Instead of starting from theoretical exclusions, the analysis focuses on measures that have already been implemented at the state level or explicitly recommended by experts for state governments. Accordingly, the next step was to create a table which provides a broad overview of climate mitigation measures that Baden-Württemberg has adopted or could further pursue. Due to the limited scope of this paper, the overview does not aim to be exhaustive and focuses on the electricity and heat sector. The electricity sector was chosen due to its direct relevance to wind energy expansion. Additionally, measures of the heat sector were included to showcase further options not available in the electricity sector. Thus, the table presents a structured yet manageable set of measures which draws on four main sources:

- The KMR published by the Baden-Württemberg environmental ministry, which documents most measures currently implemented by the government. The version used in this study was provided to me by the state's environmental ministry with the status of 3rd December 2025.
- Scientific publications, including, e.g., studies by the Climate Expert Council Baden-Württemberg (KSVR) who are appointed by the state government to evaluate existing climate governance and recommend additional measures.
- A brief comparative investigation of another German state's measures, namely Bavaria (STMUV Bayern 2022). Bavaria was chosen because, as described by Eckersley et al. (2021), it shares several structural characteristics with Baden-Württemberg and both are described as "nuclear/solar states". They therefore face comparable conditions regarding renewable energy expansion and may offer similar policy opportunities.
- Additional online research on implemented or proposed measures, primarily using information published on the websites of state governments and relevant ministries.

This combination of sources allows the identification of measures that are already implemented, specifically recommended for Baden-Württemberg, or successfully applied in a comparable state. The resulting table includes several columns that capture different characteristics of the respective measures, such as policy instruments, areas of influence and governance levels (see respective chapter).

3. Development of a Conceptual Framework

In the next step, the identified measures were synthesised into a conceptual framework describing different ways in which a state government can promote climate mitigation.

This was achieved by analysing and clustering the individual measures according to several overarching dimensions, including, e.g. the impact pathways (How does a measure contribute to a reduction in emissions?), target levels (e.g., citizens, companies, municipalities, ...), or policy instrument types (e.g. regulatory, economic, ...). The result is a structured framework that categorises the various policy levers available to subnational governments in the field of climate governance.

2.2 Case Study on Wind Energy in Baden-Württemberg

As a first step of the case study, a literature review focusing on recent publications (primarily from 2020 onwards) was conducted to analyse the development of wind energy expansion in Baden-Württemberg and wind-related measures included in the KMR were examined. The resulting insights formed the basis for developing a structured set of questions for interviews.

To complement the literature review with current practical insights, four expert interviews were conducted representing different relevant perspectives:

- Moritz Vogel, researcher at the Öko-Institut, where he has been working for 13 years. He co-authored the recent study on wind energy expansion in Baden-Württemberg by Koch et al. (2025). Interview conducted on 11 February 2026; referenced in the following as MV.
- Maike Schmidt, head of the Systems Analysis Department at the Center for Solar Energy and Hydrogen Research Baden-Württemberg and since 2021 chair of the KSVR Baden-Württemberg. Interview conducted on 16 February 2026; referenced in the following as MS.
- Tobias Tusch, managing director for generation at the Elektrizitätswerke Schönau. In this role, he is involved in several stages of wind energy projects. Interview conducted on 17 February 2026; referenced in the following as TT.
- Two employees of the Baden-Württemberg Ministry for the Environment. One focuses overarching aspects of wind energy and one primarily on permitting procedures. Due to organisational reasons within the ministry, both were interviewed together on 25 February 2026; referenced in the following as UM.

The interviews were conducted in German – direct quotes translated into English were cleared afterwards. Each interview lasted approximately one hour and followed a semi-structured format: A set of guiding questions was prepared in advance and additional questions and thematic emphases were adapted during the conversation.

The interviews were structured around the following main sections:

1. Introduction and background
 - Brief overview of the interviewee's expertise.
2. General assessment of wind energy expansion in Baden-Württemberg
 - Rating the state's performance on a five-star scale
 - Assessment of whether Baden-Württemberg is on track to achieve its expansion targets
 - Identification of key barriers and enabling factors
3. General scope of action for the state
 - Open discussion of possible policy levers available to the state
 - Using the conceptual framework developed in this study to stimulate further discussion
4. Assessment of specific policy measures
 - Identification of the most effective measures
 - Identification of measures considered less effective
 - To improve comparability across interviews, a list of potential measures derived from the literature review was presented to the interviewees at the end for this prioritisation on which they could add additional measures
5. Concluding reflections
 - Opportunity for interviewees to highlight additional aspects

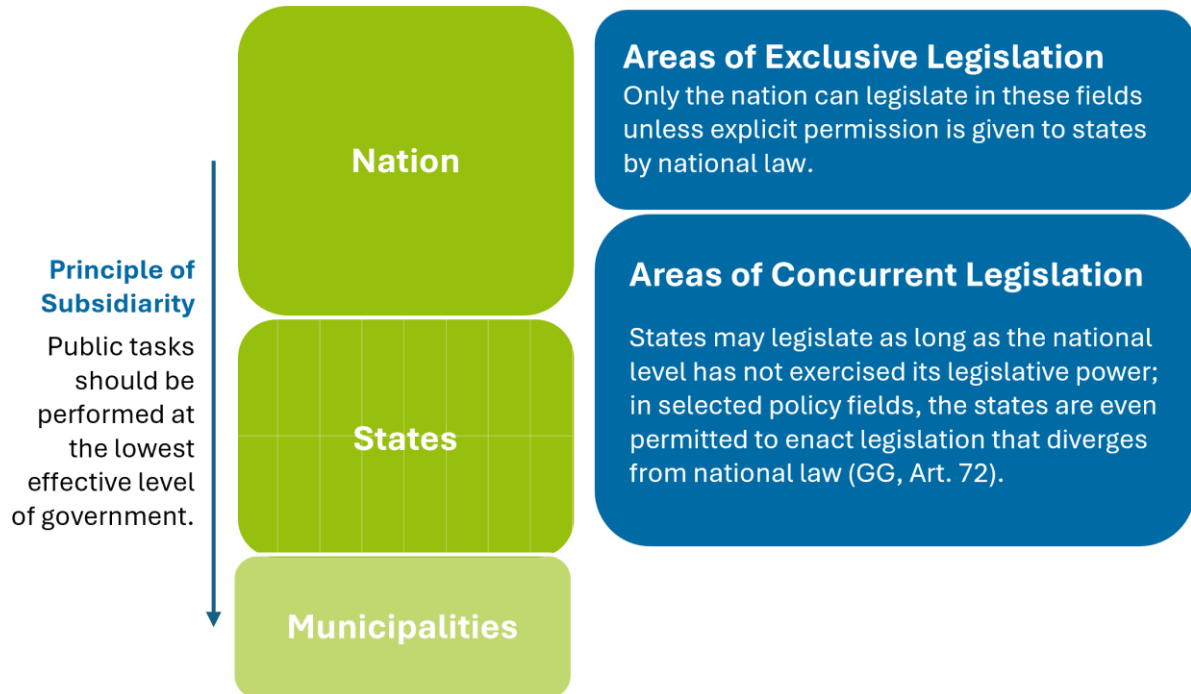
The interviews were analysed qualitatively: The interview notes and recordings were reviewed and relevant statements were extracted. Particular attention was given to identifying recurring themes, policy recommendations and perceived barriers to wind energy expansion.

Finally, the measures and challenges identified in both the literature review and the expert interviews were categorised according to the dimensions of the conceptual framework. This allowed a systematic comparison of the different sources and provided the basis for drawing conclusions regarding the policy levers available to the state of Baden-Württemberg, as well as possible refinements and future applications of the conceptual framework.

3. Background: Federalism and climate governance

3.1 General Distribution of Competences and Resources

Figure 2: Core Principles of Legislative Competences in the German Federal System



Source: Own Illustration.

The German system is characterised as administrative federalism, meaning that the exercise of state powers and the fulfilment of public tasks, are primarily the states' responsibility, unless the Constitution provides otherwise (Fenna et al. 2024). A central principle is subsidiarity, which holds that public tasks should be performed at the lowest effective level of government (Fenna et al. 2024). In practice, this grants municipalities and states primary responsibility for policy implementation, whereas the national level only intervenes if objectives otherwise cannot be sufficiently achieved or when nationwide coordination is required.

The autonomy of the states, however, is constitutionally constrained. State legislative authority exists only as long as the national level has not enacted contradicting legislation (GG, Art. 31). The Basic Law therefore distinguishes between areas of exclusive and concurrent legislation (GG, Art. 70). In areas of exclusive national competence, the states may legislate only if explicitly authorised to do so by national law (GG, Art. 71). In areas of concurrent legislation, the states may legislate as long as the national level has not exercised its legislative power; in selected policy fields such as nature protection, land distribution, or regional planning, the states are even permitted to enact legislation that diverges from national law (GG, Art. 72).

Within this constitutional framework and its restrictions, the states retain considerable scope for autonomous action (Fenna et al. 2024). Yet, this autonomy is increasingly shaped by dynamic and overlapping competences as modern federalism is characterised by a blurring of responsibilities across levels of government (Fenna et al. 2024). Intensified national activity limits states' room for manoeuvre and necessitates instrumental flexibility at the state level. State regulations must regularly be adapted to changing national frameworks, while political compromises at the national level can dilute the ambition of national instruments and create new implementation challenges for the states (Schmidt et al. 2022).

Fiscal arrangements further structure the distribution of competences. Generally, each level of government has to come up with the costs associated to its own tasks. However, when the national level mandates specific tasks to the states, it is obliged to bear the resulting expenses, the same regulation applies to states if they mandate tasks to municipalities. This is called the principle of connectivity (*Konnexitätsprinzip*) (GG, Art. 104).

3.2 Interactions and Coordination between the national and state level

Intergovernmental horizontal and vertical interactions and coordination are an important part of policy-making and implementation in federalism. The two dividing lines are vertical - between the national government and the states - as well as horizontal between the different states (Fenna et al. 2024).

First, vertical coordination between the states and the national level is primarily institutionalised through the Bundesrat. Through the Bundesrat, the states can directly influence national policy-making (Fenna et al. 2024), thereby complementing predominantly top-down intergovernmental relations with bottom-up channels of influence (Eckersley et al. 2021). The national government is required to involve the Bundesrat in legislative processes if the states are responsible for implementation (GG, Art. 23). Moreover, the national government should take the Bundesrat's opinion into account if the states' interests are affected. If the states' administrative structures, authorities, or procedures are concerned, the Bundesrat's position must be given particular weight in the decision-making process. In the Bundesrat, members vote on behalf of their respective states, submitting unified state positions rather than individual votes, which requires each state to form a joint position on each issue (Bloquet and Carstensen 2024). Beyond the Bundesrat, vertical coordination also takes place through federal-state working groups ("Bund-Länder-Arbeitsgemeinschaften") that operate in specific policy fields, such as climate, energy, mobility, and sustainability (Eckersley et al. 2021) as well as more informal arrangements (UM).

Second, horizontal coordination among the states is only weakly regulated by the law. Respective institutions exist anyway: Currently, around 18 ministerial conferences bring together ministers and senior officials from the state governments and, in some cases,

representatives of national ministries to exchange information and coordinate policies within specific policy fields (Behnke and Kropp 2025). In addition, a wide range of more informal formats exists, including ad hoc meetings, working groups, and task forces, which may either operate over longer periods or be set up only temporarily (Behnke and Kropp 2025).

3.3 Climate Governance in the Context of the German Federal System

For the implementation and design of climate mitigation measures, the states need - and possess - specific legislative competences, administrative authority, and financial resources (Fenna et al. 2024).

Climate governance is shaped and constrained by a combination of constitutional and fiscal principles. In particular, the adoption of binding measures is often limited and politically unattractive for states for several reasons. First, although both the federal and the state levels are entitled to legislate on climate mitigation, federal law takes precedence in overlapping cases (Müller et al. 2024). Second, the constitutional right to local self-government and the principle of connectivity create disincentives for states to impose legally binding climate obligations on municipalities (Eckersley et al. 2021).

Despite the overall hierarchical framework, the states retain room for manoeuvre and can pursue individual approaches to climate mitigation. In their responsibility for implementation of national regulations states can influence the effectiveness of certain measures (Eckersley et al. 2021). For example, they do licensing and approval procedures, as well as regional, spatial, and land-use planning, and thus have the authority to designate areas for renewable energy development (Ohlhorst 2015). Through these activities, states can decisively shape the conditions for the expansion of renewable energy and associated grid infrastructure (Ohlhorst 2015). In addition, there are many issues in the area of concurrent legislative competence (GG, Art. 74) where the nation did not pass laws (yet), allowing state parliaments to legislate (Hager and Stefes 2016). In certain fields, including nature protection, land distribution, and regional planning, the states are even explicitly permitted to enact legislation that diverges from national law (GG, Art. 72). Moreover, the states enjoy substantial autonomy in organising their administrative structures, allocating responsibilities among authorities, and distributing financial resources. This has a significant impact on the effectiveness and pace of climate mitigation (Müller et al. 2024). Finally, states frequently respond to overarching policy objectives with strategies tailored to their specific local contexts. Although state energy strategies often lack detailed or legally binding provisions, they typically serve as guiding frameworks and can exert meaningful influence on climate-related developments (Eckersley et al. 2021).

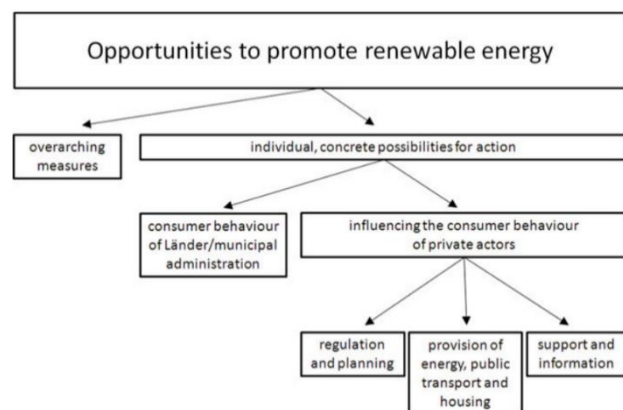
3.4 Existing Frameworks of States' Opportunities for Climate Mitigation

The following two existing publications describe and categorize states' opportunities to further climate mitigation. Both provide a good basis for understanding states' options for action but lack in detail and instructiveness.

Framework by Schönberger and Reiche (2016)

The “*overview of state and municipal opportunities to promote renewable energy*” compiles states' and municipal paths of influence. It distinguishes between five governance modes: overarching measures, consumer behaviour of public administration, regulation and planning, provision of energy, public transport, housing, and support and information. “These five categories refer to different levels of action” (Schönberger and Reiche 2016, p. 31) as can be seen in Figure 3. However,

Figure 3: Overview of State and Municipal Opportunities to Promote Renewable Energy



Source: Schönberger and Reiche (2016, p. 31)

this categorisation is not specific to the German states, as it also applies to municipalities and subnational governments in other countries. Moreover, its broad and general character limits its instructiveness for analysing concrete state-level action. This points to the need for a more detailed and state-specific framework.

Framework by the ifeu (2021)

The framework shown in Figure 4 visualises the different roles a state can assume in promoting climate mitigation. This approach is valuable, as it goes beyond formal competences and highlights functions such as acting as an experimentation space or advancing climate action at the national level. At the same time, the framework remains highly abstract and does not specify the concrete types of measures available to the state or the mechanisms through which it can influence other actors. Consequently, its instructiveness for analysing state-level climate policy instruments is limited, but it provides a useful complement to more measure-oriented analyses.

Figure 4: States' Scope for Action Regarding the Development of Climate Protection Instruments and Measures



Source: ifeu, "Klimaschutzgovernance und die Rolle der Bundesländer," internal working paper commissioned by a German federal state, unpublished, Heidelberg, 2021 as cited in Schmidt et al. (2022, p. 15)

4. Developing a Framework for State-Level Levers for Climate Mitigation

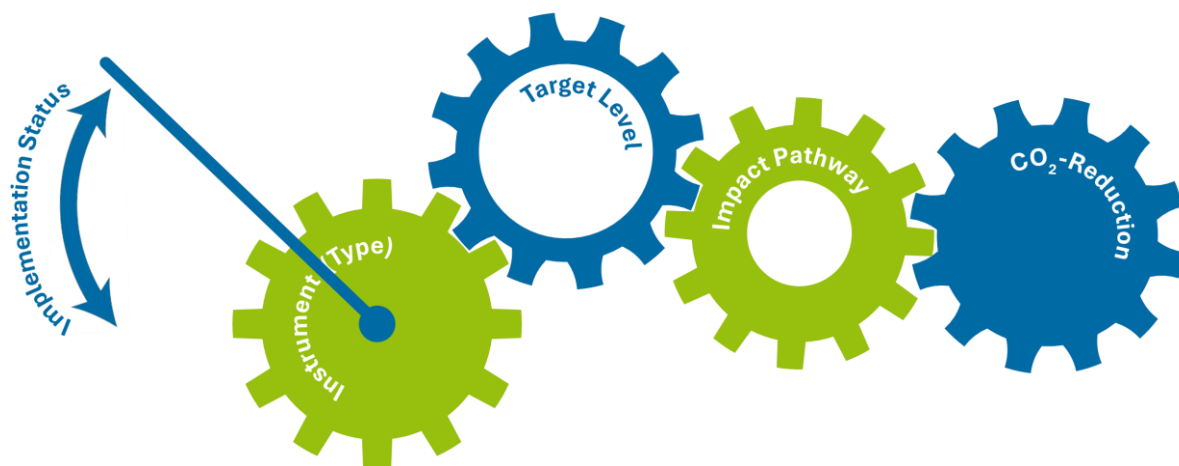
4.1 Table of Current and Potential Measures in Baden-Württemberg

Categories of the Table

To identify measures available to the states, the table in Appendix A compiles an overview of measures that have been implemented by or recommended to Baden-Württemberg.

Categories in the Table of Measures

Figure 5: Key Characteristics of State-Level Climate Policy Measures



Source: Own Illustration.

The measures identified were further characterised in the following columns.

Measure

In this column, a short title of the measure is stated.

Cluster

Some of the measures are associated with the same goal or regulation and therefore have a common title in the Cluster column. The four clusters identified are municipal heat planning, provision of space for renewable energy plants, PV obligation, and the climate neutral state administration.

Sector

This column states whether the measure belongs to the sector of heat transition, to the electricity transition or affects both ("cross-cutting"). As Schmidt et al. (2022), I adjusted the sector boundaries of the KMR. The sector "heat transition" includes, e.g., district heating so that the "Electricity Transition" can be defined more narrowly than the "Energy

Industry” sector in the KMR. Thus, the sector of electricity transition is focused on the generation, storage and distribution of electricity while the sector of heat transition is focused on the generation, distribution and use of heat.

Instrument Type

The measures can be grouped into different types based on their approach to driving change. The categorization follows the framework in the KMR but is adjusted for clarity and consistency. A measure can belong to more than one category.

- **Consulting & Participation**
Measures aimed at improving decision-making processes by involving external expertise and citizens in legislative or political processes. This includes advisory councils, public consultations, and citizen participation processes.
- **Cooperation & Coordination Instruments**
Instruments that enhance synergies and visibility of climate mitigation efforts by promoting cooperation among various actors, including private sector players, municipalities, and different political levels (e.g., federal and state governments).
- **Economic Instruments**
Instruments that provide economic incentives to encourage climate mitigation actions. Examples include funding programs, low-interest loans, tax relief, carbon pricing mechanisms (e.g., CO₂ shadow price).
- **Education & Campaigns**
Measures designed to increase awareness, engagement, and motivation for climate mitigation among citizens and other stakeholders by providing education, information campaigns, and social norm-building activities.
- **Informational & Supporting Instruments**
Instruments that provide targeted support for the implementation of specific measures, such as advisory services, digital tools, and direct technical assistance. These instruments aim to help actors navigate complex processes and apply specific climate actions.
- **Planning & Strategic Instruments**
Instruments that help shape the long-term direction of climate actions, including goal-setting, strategic planning, and the coordination of policies across different sectors and spatial levels.
- **Regulatory Instruments**
Legally binding measures that mandate, prohibit, or standardize behaviours to achieve climate goals. This includes laws, regulations, emission limits, and obligations that steer behaviour towards the desired outcomes.
- **Other/All**
This category includes measures that do not fall into the above categories or are framed so broadly that they encompass elements of multiple categories.

Target Level

The addressees in the KMR are categorised in a very detailed way which does not provide additional insight for the goals of this paper. Therefore, I clustered and summarised them into the following categories.

- Private Households
 - Persons acting in their personal interests
- Civil Society
 - Organisations or groups of people with specific common interests (e.g. youth, land users, multipliers, NGO's, social institutions, labour unions)
- Companies & Economic Actors
 - Individuals or organisations that act in their own economic interest.
- Bundesrat / Nation
 - Measures that are directed at changing policy or practice at higher political levels
- State institutions
 - Institutions that belong to the state administration, its government, or are mainly owned by the state
- Science, Research & Education
 - Actors in research, universities, science, and educational institutions
- Municipalities / Regional Authorities
 - Political and administrative organisations that are below the state level.
- Other
 - Measures that are directed to actors which do not fit in the categories mentioned above
- Various / All
 - Measures that are targeted at (almost) all actor-categories above

Implementation Status

For each measure, this column shows whether it has been implemented in Baden-Württemberg. The respective categories are:

- Implemented
- Partly Implemented
- Decided on / Planned
- Not Implemented
- Expired / Ended

Impact Pathway

The impact of all listed measures is a reduction in greenhouse gas emissions – this category aims at showing how this reduction is ultimately achieved as many measures are rather indirect ways of aiming at this reduction.

- Reduced Energy / Heat Demand
 - Measures that promote efficiency or sufficiency which reduce the demand for energy regardless of the source of the energy.
- Renewable Energy Expansion
 - Measures increasing the supply of renewable energy in form of electricity or heat.
- Energy Infrastructure Expansion / Optimisation
 - Measures regarding the distribution and storage of energy including, e.g., grid expansion or grid design
- Fuel Switch
 - Measures aiming at replacing fossil energy systems with renewable ones, e.g. by incentivising the placement of heat pumps, changing the energy source of heat grids or by disincentivising or prohibiting fossil systems.
- New Technologies
 - Measures promoting the development or rollout of new climate friendly technologies, including, e.g., fuel cells or hydrogen applications.
- Various
 - Some measures, e.g. overarching strategies or decarbonisation targets, do not have one specific impact pathway but promote several ones – those are listed in this category.

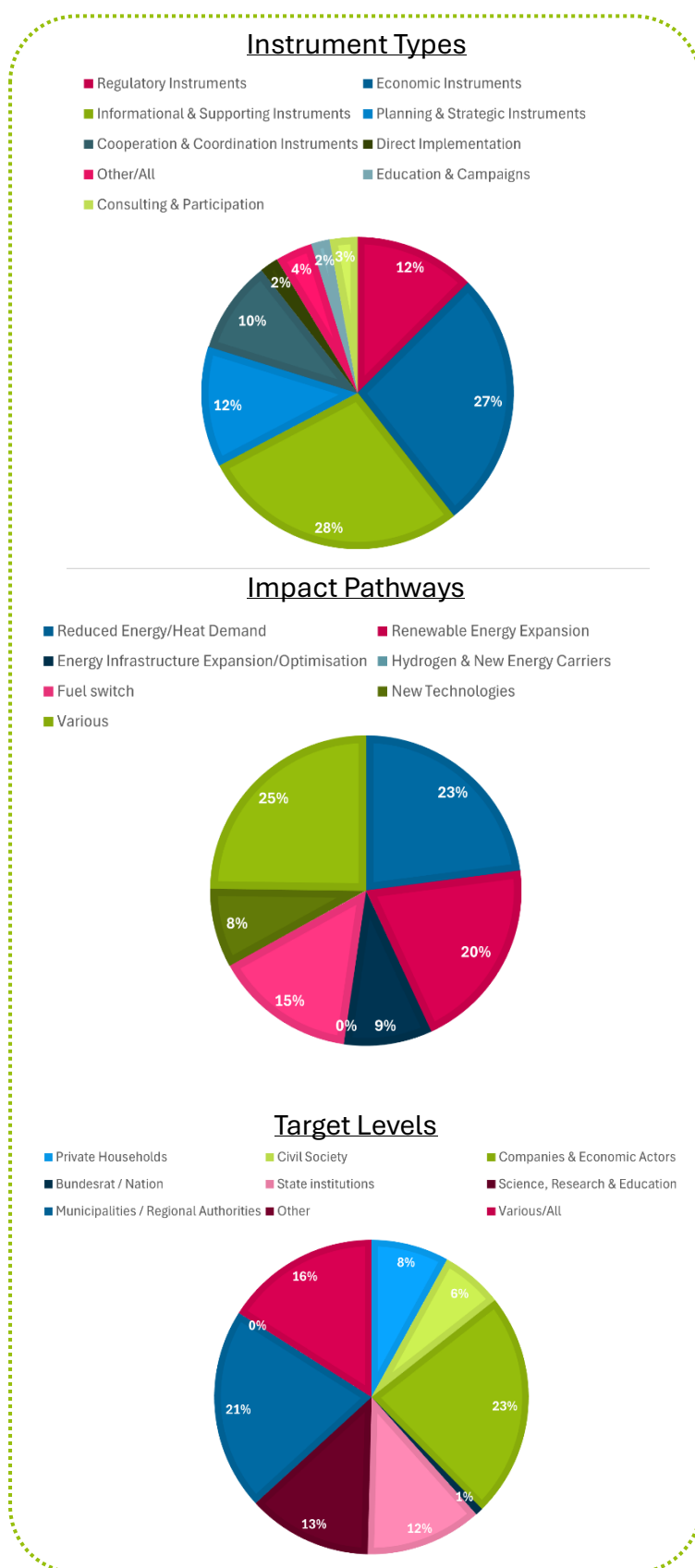
Observations

The statistical analysis of climate mitigation measures in the energy sector in Baden-Württemberg (see Appendix B) reveals several noteworthy patterns regarding the current policy approach of the state.

First, while 90 measures were identified as implemented, only 73 are included in the KMR. This suggests that the register does not yet fully capture all relevant climate mitigation measures and its comprehensiveness could be improved.

Second, the distribution of instrument types among the implemented measures shows a clear pattern as shown in Figure 6. More than half of the measures focus on informational, supportive, or economic instruments. In contrast, regulatory instruments appear comparatively less frequently. Recommended measures contain a substantially larger share of regulatory instruments. This suggests that the state government may currently prefer incentive-based and supportive approaches over regulatory interventions, even in cases where regulatory instruments could potentially be applied. Accordingly, Schmidt et al. (2022) state that, in almost all sectors, more activating instruments or measures in the area of education are comparatively underrepresented. Reasons for this may lie in questions of public acceptance as well as the principle of connectivity but have to be further explored elsewhere.

Figure 6: Distribution of Characteristics of Climate Policy Measures Implemented by Baden-Württemberg



Source: Own illustration on basis of Appendix B.

Third, regarding the impact pathways of the measures, the KSVR identified further gaps in its 2022 evaluation, which appear to have changed little since then. In particular, aspects of sufficiency currently appear mainly within the categories of information and advisory measures but are not translated into more concrete policy instruments (Schmidt et al. 2022).

Fourth, when analysing the target levels of the measures, the distribution appears more balanced. However, the implemented measures contain a comparatively large number of measures targeting science, research and education, while recommended or additional potential measures in the literature rarely focus on this target group. This may indicate that this area is already addressed relatively extensively in current policy. In contrast, measures targeting private households appear proportionally more often among recommended measures than among implemented ones. This may suggest a certain reluctance of the state to intervene more directly in the behaviour of private individuals. Another observation, also made by the KSVR, concerns the limited reference to interactions with the federal level. Although the KMR primarily focuses on measures implemented at the state level, the council notes that the interfaces and synergies between state and federal policies are rarely addressed explicitly, even though they are highly relevant for the overall effectiveness of climate governance (Schmidt et al. 2022).

Overall, these findings should be interpreted as cautious observations rather than definitive conclusions. They may indicate certain preferred approaches of the state government. However, the recommended measures included in this analysis were not systematically assessed regarding their legal or political feasibility. Further research would be necessary to examine whether these patterns reflect deliberate strategic choices, institutional constraints, or other factors, and to what extent similar patterns can also be observed in other German states.

4.2 Framework of State Policy Levers for Climate Mitigation

Figure 7: State Policy Levers to Promote Climate Mitigation



Source: Own illustration.

Compiling the table's empirical overview of implemented and suggested measures, this framework helps to analyse and investigate how states can promote the energy transition across different spheres of influence. It distinguishes between direct implementation and the influence on national action, regional authorities, and private actors, and links each sphere to key types of policy instruments. As no measure explicitly targeting Regional Authorities other than municipalities was stated in the sources informing the table, this target level was added after the application to the case study where the role of district offices (*Landratsämter* – LRAs) and regional associations became evident.

By organizing state action along the two dimensions of “who is influenced” and “how influence is exercised”, the model not only maps the full range of options available to states but also serves as a practical guide for identifying and designing concrete measures.

The following section further defines these categories by exemplifying the main instrument types and pathways of influence. In doing so, it expands the model to serve as a starting point for more detailed analyses of specific policy fields, where additional, more specialized regulations further shape opportunities and limitations.

Influencing Municipalities

Require action: Regulation & Legislation

- Regulation in areas of concurrent legislation where the federal level has not legislated or explicitly allows (diverging) state legislation
- Preserving municipal self-government (GG, Art. 28)

Examples

- Binding state-level legislation and ordinances
- Classification of mandatory municipal tasks
- Regulation of administrative procedures
- Monitoring, reporting, and review obligations
- Legislation on municipal taxes/fees

Guide action: Planning, Targets & Strategy

- Long-term targets and pathways that shape expectation and reduce uncertainty for action.
- State strategies and roadmaps that indicate preferred technologies and timelines to guide decisions.
- Spatial planning signals: Designating priority or exclusion areas that steer municipal project planning
- Strategic prioritisation through model projects

Facilitate action: Information & Support; Cooperation & Coordination

- Consulting municipalities on, e.g., mitigation measures, available funding programs, or regulations.
- Providing guides, standard procedures, transparency
- Standard-setting and planning guidelines issuing technical standards, model regulations, and planning guidelines
- Simplification of, e.g., approval processes
- Create synergies by initiating cooperations and coordinating actions of municipalities; Supporting or mandating joint municipal bodies
- Training programs for municipal employees
- One-stop shops at state level that bundle legal, technical, and financial expertise for municipalities (e.g. KEA)
- Providing digital tools, platforms or data services
- Providing, e.g., staff secondments or mobile expert teams

Make action economically viable: Economic Instruments

- Subsidy and funding programmes for climate-friendly municipal investments
- Preferential financing conditions such as low-interest loans, guarantees, risk-sharing instruments, and insurance schemes
- Conditional funding design linking grant conditions to performance criteria
- Carbon-related price signals within public decision-making
- Bundling mechanisms, such as pooling municipal projects to reduce costs
- Support for preparatory and transaction costs, including funding for feasibility studies, planning, and project development
- Performance-based incentives, rewarding early movers or municipalities that exceed minimum climate requirements

Motivate & enable action: Education, Campaigns & Other

- Public campaigns
- Competitions, awards, benchmarking and rankings
- Workshops for municipal employees
- Showcasing of especially climate friendly municipalities
- Guidance-oriented campaigns: communication campaigns targeted at municipal decision-makers
- Leadership programmes for mayors and councillors: Tailored training for political leadership at the municipal level.

Enable evidence-based action: Research & Innovation

As municipalities do not do much innovation, there are few possible measures in this section – but the state might nudge municipalities to work on/test social innovations.

- Inter-municipal innovation challenges: Cities compete for funding to pilot climate-neutral solutions
- Support for “Living Labs”: Cities act as testbeds for new technologies and urban solutions
- State-municipality framework agreements that define innovation targets

Influencing National Action

Participate in Regulation & Legislation

- Voting and state initiatives in the Bundesrat

Coordinate with Other States

- Bilaterally or in existing Ministerial conferences (Behnke and Kropp 2025)

Direct Implementation

The state administration, state owned companies and other state property are responsible for quite a lot of emissions themselves which the state government can influence

- Targets and regulations addressing state administration, buildings and estates
- Regulations on public procurement
- Influencing (majorly) state-owned companies:
- Capacity-building and awareness: Training, guidance, and accessible tools for state employees

Influencing private actors	
Require action: Regulation & Legislation	
	• In areas of concurrent legislation where the nation did not pass any laws yet or explicitly allows for (diverging) state legislation that directly obliges to employ a climate mitigation measure.
Guide action: Planning, Targets & Strategy	
	• Clear long-term targets and pathways that shape expectation, create lead markets and reduce uncertainty for private action. • State strategies and transition roadmaps • Spatial planning signals that steer private project. • Standard-setting and planning guidelines Issuing technical standards, model regulations, and planning guidelines
Facilitate action: Information & Support; Cooperation & Coordination	
	• Consulting private actors on, e.g., mitigation measures, available funding programs, or regulations directly or via guides • Simplification of, e.g., approval processes • Create synergies by initiating cooperations and coordinating between various actors
Make action economically viable: Economic Instruments	
	• Subsidy and funding programs • Attractive conditions for investing, e.g. low-interest loans, Guarantees, risk-sharing instruments, or insurance schemes • Tax- & fee-related incentives especially in legislation on municipal taxes/fees • Carbon-related price signals • Pooling private investments to reduce transaction costs • Market creation through securing public demand
Motivate & enable action: Education, Campaigns & Other	
	• Public campaigns • Curricula in education institutions and (vocational) schools • Negotiating university contracts and performance agreements, as well as securing funding for them • Definition of specific educational policy priorities
Enable evidence-based action: Research & Innovation	
	• Establishment of R&I competitions • Economic levers: Targeted funding, public-private-co-funding schemes, ... • Research-friendly framework conditions: Multi-year core funding, support for recruiting leading researchers • Knowledge and technology transfer: Strengthening cooperation between research institutions and other actors. • University contracts and target agreements, including linked funding. • Innovation-oriented public procurement by acting as an early adopter • Strategic priority-setting: Defining research missions and societal challenges through state R&I strategies and roadmaps.

6. Case Study: Wind Energy Expansion in Baden-Württemberg

6.1 Targets and Status Quo of Wind Energy Expansion in Baden-Württemberg

Baden-Württemberg is required by national law to designate 1.1% of its territory as wind energy areas by the end of 2027 and 1.8% by the end of 2032 (WindBG, §3). The state has adopted a more ambitious timeline, aiming to reach the 1.8% target already by the end of 2027 and ensuring a relatively even distribution of wind energy areas across its twelve planning regions (KlimaG BW, §20).

The state has set itself the goal to reach 12.1 GW of installed capacity by 2040 and 6.1 GW until 2030 (Umweltministerium BW 2024). This corresponds to approximately 2100 or 1400 wind turbines (Landtag BW 2025). Current installed capacity stands at 2,056 MW, and wind energy expansion stagnated between 2020 and 2025, with an average annual addition of 95.6 MW (LUBW 2026). Reaching the target will therefore necessitate a substantial acceleration of deployment, with annual additions rising to between 400 MW and 650 MW (Koch et al. 2025).

Indeed, there has been a significant rise in applications for the approval of wind turbines in Baden-Württemberg. If all plants currently planned were approved and implemented, the 2040 expansion target would be reached (MS). However, “a designated area is not yet a built wind turbine, and an approved plant is not yet a built wind turbine either – an investment decision is required, and the path towards it is a difficult one” (TT).

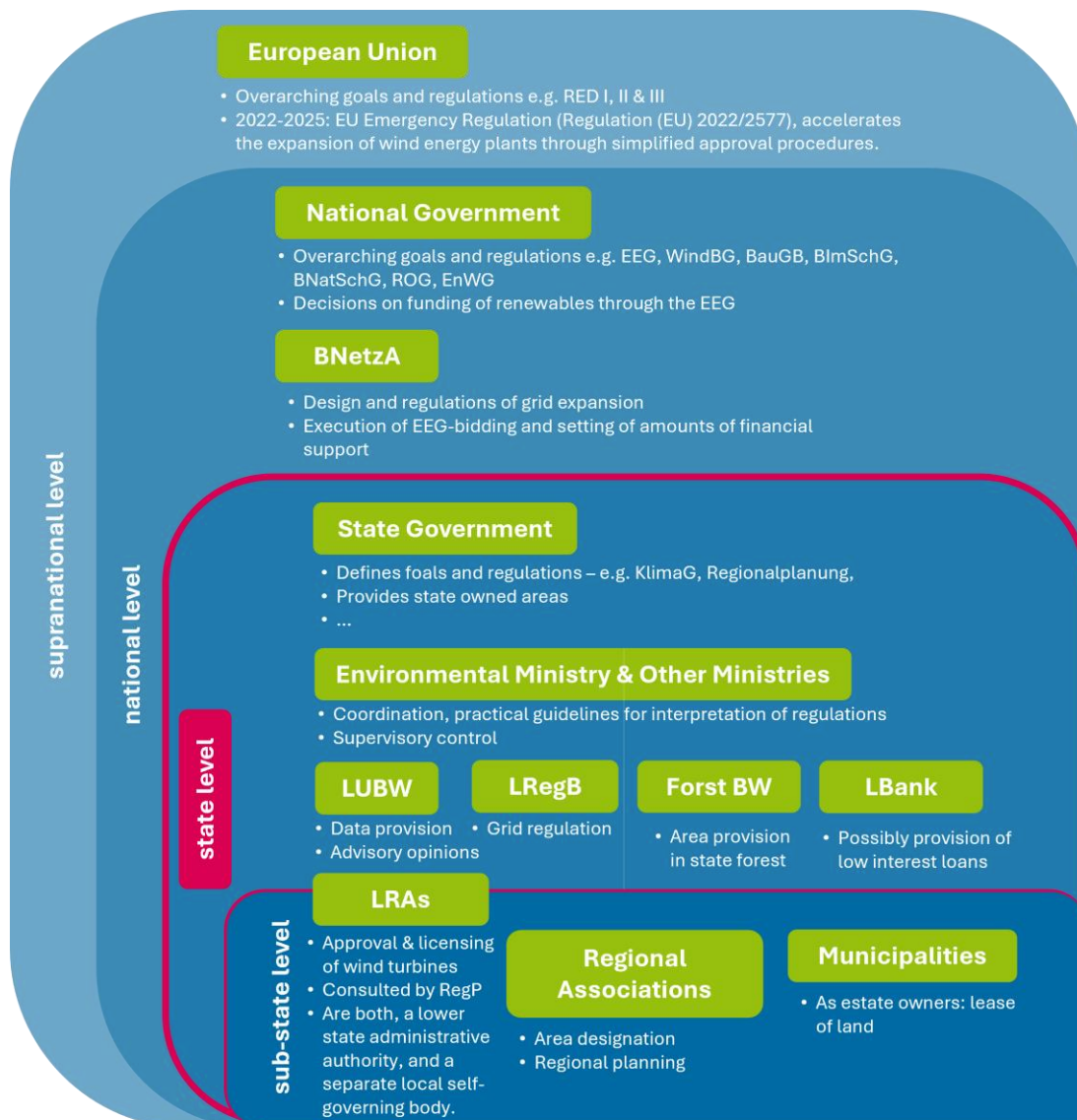
This leads to the question how and to what extent state level politics can influence wind energy expansion and whether Baden-Württemberg already makes full use of its possibilities.

6.2 Building a Wind Turbine in Baden-Württemberg: Actors, Framework Conditions and Process

To investigate states' opportunities to promote wind energy, it is important to understand the respective processes and who and what influences them.

First, in wind energy expansion, a lot of public institutions are involved as outlined in Figure 8. Additionally, in some cases, courts can also become relevant actors, as wind energy projects are frequently subject to legal challenges and developers may seek legal remedies to obtain more favourable permitting conditions (TT). As they are not part of the standard process however, they are not included in the graphic.

Figure 8: Overview of Governance Levels and Public Actors Involved in Wind Energy Expansion



Note: RegP: regional administrative offices; LRegB: state regulatory authority

Source: Own Illustration.

Second, a range of private actors are also involved in the development of wind energy projects. These include wind energy developers and operators but also landowners who decide whether and under what conditions they lease their land. In addition, civil society actors can influence the development of wind energy projects by expressing support or opposition to projects.

Finally, a number of external factors influence the development of wind energy projects. These include geographical conditions, as well as broader economic developments like rising prices caused by disrupted global supply chains.

Overall, the development of a wind energy project follows several typical stages (Koch et al. 2025):

- Identifying suitable areas – either by the designation of priority areas, or, if this has not been done yet, in an area of the project developer's choosing (TT).
- Securing a specific site through lease agreements
- Permitting procedure.
- Marketing - usually through participation in the auctions under the Renewable Energy Sources Act (EEG). Alternatively, electricity may be sold through long-term power purchase agreements, although this option currently plays only a minor role in Baden-Württemberg (UM).
- Securing financing, either through the developer's own capital or through external financing
- Construction
- Grid connection

The order of seeking permission and securing a site may vary to ensure the project's feasibility before committing to potentially costly lease agreements.

6.3 State-Level Paths of Influence

Within this framework of responsibilities and regulations, what scope of action remains for Baden-Württemberg to promote wind energy expansion? Using the framework the following section maps the measures available to the state as described in existing literature and expert interviews.

Influencing National Action
Background National laws and regulations play a decisive role in shaping the framework conditions for wind energy expansion in Germany. Key legal foundations include the Federal Immission Control Act (BImSchG) and its implementing ordinances (BImSchV), the Federal Building Code (BauGB), the Federal Nature Conservation Act (BNatSchG), as well as the EEG. The interviewees consistently emphasized that, currently, the most decisive framework for project realization is the EEG, which regulates the auction-based subsidy system and without which almost no turbines are built (UM; MV; MS; TT). However, projects in Baden-Württemberg currently receive only a small share of the awarded subsidies despite the reference yield model intended to compensate for less favourable wind conditions: In 2025, only approximately 2.4% of awarded contracts for onshore wind energy were allocated to projects in Baden-Württemberg, declining continuously over the course of the year (BNetzA 2026).
Participate in Regulation & Legislation In principle, all national regulations affecting wind energy expansion are subject to influence by the federal states through political advocacy and participation in federal legislative processes. Currently most effective would be adjustments to the EEG that result in a higher share of auction awards for projects in southern Germany. Potential approaches include the introduction of a quota reserving a certain share of auction awards for wind projects in southern Germany (MV; TT; UM; MS), adjustments to the reference yield model (Koch et al. 2025); UM; MV), or an increase in the overall auction volumes (UM). Another important area of national policymaking concerns the expansion of the electricity transmission grid (MS; (Koch et al. 2025). In this context, Baden-Württemberg could advocate for faster grid expansion and regulatory frameworks that better support the integration of renewable electricity generation in southern Germany (MS). Generally, initiatives brought forward by states are most likely to succeed when they align closely with the prevailing political priorities at the national level and have to be communicated proactively as the national government does not ask or wait for states' proposals (UM). If alignment exists however, states can exert considerable influence on federal legislation. Baden-Württemberg, for example, successfully advocated for changes that enabled the development of wind turbines in certain landscape conservation areas (UM).

Coordinate with Other States

Such coordination already takes place: Representatives of the ministry frequently exchange with their counterparts in other states to align administrative practices and interpretations of nationwide legislation as far as possible (UM).

Influencing Municipalities / local and regional authorities

Background

Municipalities

Formally, the only point of municipalities' influence lies in the decision whether to lease their land to wind project developers. In many cases, local resistance leads to decisions against leasing land, even though municipalities could benefit financially from such agreements (MV; TT):

"I see wind energy expansion primarily as a major opportunity for municipalities. In public debates, it is often framed mainly in terms of burdens, but if municipalities approach it strategically, they could benefit significantly, for example by leasing their land. One reason this often does not happen is that local decision-makers, such as mayors, worry about re-election. (...) At the same time, however, areas near municipalities will be designated for wind development anyway under the Wind Energy Area Requirement Act. In that situation, it would make more sense for municipalities to actively shape the process rather than just let it happen—otherwise they may end up looking at a wind farm without receiving any financial benefit from it." (MV)

Beyond their role as landowners, municipalities also significantly shape local acceptance of wind energy.

Other public authorities

The regional planning associations operate independently from the state administration and are responsible for regional spatial planning, including the designation of areas for wind energy (TT; Koch et al. 2025). If insufficient areas are designated in comparison to then requirements of the WindBG, wind turbines can be built in a much broader range of locations under the provisions of §35 of the Federal Building Code (TT).

Require action: Regulation & Legislation

Municipalities

Probably, municipalities could in principle be obliged to lease their land for wind energy projects under favourable conditions. However, the legal feasibility needs to be assessed, and such a strict regulation could lead to increased local resistance (TT). Therefore, no expert proposed this measure, but it showcases how potentially strong legal regulations by the state could be.

A more attainable regulatory approach is, for example, to require municipalities to contribute to improving public acceptance by providing information and educational activities for local citizens (MS).

Regional Planning Associations

The obligation for earlier implementation of national land designation targets in combination with a good cooperation between planning responsibilities and planners increased number of applications for admission according to Maike Schmidt. Tobias Tusch, however, showed more hesitancy about this aspect: “There are people who say that bringing forward the 1.8% target in Baden-Württemberg to September 2025 is a major step. You can see it that way, but you don’t necessarily have to. Previously, Section 35 of the German Building Code applied, because in many places a detailed designation through spatial planning or land-use planning had simply not been completed in a final or binding way. In theory, this meant that building rights existed there if a project received approval. So if we now say that the target is 1.8%, while previously Section 35 of the Building Code applied and construction was often generally possible, the question arises: Is that actually an improvement or not?” (TT).

As not all designated areas are in the end suitable, their continuous evaluation is proposed after a period of consolidation (Koch et al. 2025). However, new designation of areas does not necessarily solve decisive problems: If municipalities do not want to lease their areas in the first regional plans, they will also be unwilling to do with other areas in their vicinity (TT).

Guide action: Planning, Targets & Strategy

The state’s wind energy expansion targets already clearly signal that wind energy development is politically desired and will continue to expand within the state. Beyond this, however, no additional specific targets or strategic obligations for regional authorities have been decided on by the state government.

However, often, there seems to be a lack of clear guidance within the authorities that wind energy expansion is expressly desired as implementation continues to depend heavily on the practices and attitudes of the respective approval authorities (MV). This suggests that there is need for more internal guidance and clearer communication.

Facilitate action: Information & Support; Cooperation & Coordination

First, to improve municipalities’ knowledge on how to benefit from and promote wind projects, several measures can help: Formats for exchanging experiences and knowledge between regions (MV), early involvement in the spatial planning (MV), or supporting establishing local participation and information formats as already done earlier by the state’s “Forum Energiedialog” (UM). Accordingly, “Erneuerbare BW” was established and well-staffed to advise, encourage and support municipalities to provide their areas (UM). Additionally, transparency regarding available land and expansion plans, as well as clear signals from the management of approval authorities that wind energy is supported, increase the chances of implementation. State politics can give impulses, employ staff, set guidelines, and make the municipal expansion of renewable energies more visible and comprehensible (MV).

Make action economically viable: Economic Instruments

A frequently discussed instrument is a mandatory financial participation of municipalities in wind energy revenues, on basis of the EEG, that allows operators to voluntarily pay neighbouring municipalities up to 0.2 ct/kWh and have this reimbursed. Making this obligatory at the state level could increase local value creation, potentially encouraging municipalities to support projects (MS; MV; Koch et al. 2025). Similar participation schemes have been introduced in other German states (MV; MS).

However, the effectiveness of this measure was not uniformly supported by the interviewees. That most projects already provide voluntary payments (MS; MV; TT; Koch et al. 2025), suggests that a legal obligation might have limited additional impact (TT). Furthermore, mandatory payments would further increase project costs thus potentially hindering economically viable project development (TT). “If participation payments are made, there should also be some form of return. For example, less resistance or, from a business perspective, projects moving through the process more quickly. But I have doubts about that. I don’t believe that effect actually exists. Our experience is that participation payments are simply priced in by the recipient. They have no effect on the project itself. In that case, they are unnecessary.” (TT). Moreover, municipalities may increasingly regard such payments as standard practice rather than a genuine form of participation (TT).

The environmental ministry reportedly rejected a mandatory scheme due to fears of potential location disadvantages for Baden-Württemberg, although proponents argue that experiences in other states do not indicate clear competitive disadvantages (MS).

Motivate & enable action: Education, Campaigns & Other

First, events, communication and campaigns directed at municipal actors can influence municipal decision-making. If wind energy expansion is perceived positively and associated with innovation, sustainability, and local economic benefits, municipalities may be more inclined actively support it. The work of the state’s “Erneuerbare BW” in the KEA is an example of this as it does not only provide municipalities with advice but also proactively encourages local actors to support wind energy expansion (UM). Second, training initiatives can address existing capacity gaps. Expanding professional training programmes for local actors can support the practical implementation of wind energy projects (Koch et al. 2025). Third, in principle, the state can enable municipalities to more action by giving them more legal rights. For example, in 2011, Baden-Württemberg changed its State Planning Act to allow municipalities to designate wind priority areas themselves (UM).

Enable evidence-based action: Research & Innovation

For this category, no measure was stated in literature or interviews.

Influencing private actors

Background Information

Project developers and planners make decisions primarily based on economic considerations. Their role typically encompasses the entire project cycle and they interact with a variety of public institutions. A further relevant group consists of private landowners. Finally, civil society actors, such as residents, citizens' initiatives, and non-governmental organisations, may support or oppose wind energy projects.

Require action: Regulation & Legislation

Unlike in, e.g., the expansion of solar energy, in the sector of wind energy, no state-level measures directly requiring private actors to support or expand wind energy were mentioned.

Guide action: Planning, Targets & Strategy

In Baden-Württemberg, the overarching targets for expanding wind energy already serve as a significant signal to the market and create a degree of planning certainty for private stakeholders. Beyond these overarching targets, neither the expert interviews nor the reviewed literature proposed additional strategic obligations directed at private actors.

For energy companies that operate both fossil and renewable power plants, another important strategic orientation concerns the future framework for fossil electricity generation. This aspect is reflected in the state's energy concept (Umweltministerium BW 2024), which discusses the long-term transformation of the energy system.

A further policy field in which the state can indirectly influence wind energy expansion is electricity grid development. Improved coordination between grid expansion and wind energy planning would be beneficial, as connecting newly planned turbines to the grid remains a significant challenge in many locations (Koch et al. 2025).

Facilitate action: Information & Support; Cooperation & Coordination

Approval process – time, process & complexity

The quicker and less complex approval processes are the better for project developers. Faster procedures allow developers to generate revenues earlier and reduce the resources that must be invested in this non-productive phase (TT; MV; UM). This is particularly relevant under the current EEG, as the remuneration levels in the auctions are gradually declining and earlier participation in the auction system and results in higher remuneration levels. In this context "time is money" (TT).

The state government of Baden-Württemberg has established a task force for renewable energies, which sought to accelerate permitting processes (KMR; MS; Koch et al. 2025). These resulting measures have contributed to a noticeable reduction in approval times from up to three years, to around seven months of pure processing time in some district authorities (MS). However, with the recent strong increase in submitted projects, processing durations may rise again (MS).

The measures that contributed to this acceleration include, first, the abolition of certain objection procedures, a reduction in the number of judicial instances, and the establishment of specialised coordination units at the regional administrative authorities that support the LRAs in dealing with complex cases (UM). Second, specific

sectoral regulations have been simplified. In the field of monument protection, Baden-Württemberg introduced a binding assessment grid, which standardises the evaluation of potential impacts on protected heritage sites. This has significantly reduced uncertainties and the need for additional case-by-case evaluations (Koch et al. 2025). Third, the state has established an “Infrastructure Senate” at the Administrative Court which handles all disputes concerning the construction, operation, or modification of wind turbines (Staatsministerium Baden-Württemberg 2022). Finally, two new institutions were established to optimise administrative procedures and to function as “one-stop shop” for both permitting authorities and project developers (Koch et al. 2025).

In addition to the measures already implemented, the literature and expert interviews identify several further options for improving the efficiency of approval procedures. First, a frequently discussed aspect lies in stacking up personnel in authorities (MS; Koch et al. 2025). However, that other states manage more applications also with few personnel better, suggests that more focus should be laid on efficiency, increase in experience and organisational framework conditions (TT; MV). Second, Internal monitoring systems that track the status of approval procedures may also help authorities manage workloads more effectively and ensure timely progress (MS; Koch et al. 2025). Third, the digitisation of approval procedures has already started but could be further improved as there seem to be significant differences between the authorities (MV; TT; Koch et al. 2025). Fourth, expanding standardisation, for example through text modules used in permits and expert assessments, could further accelerate the process (TT). Fifth, several proposals aim at strengthening coordination and sharing of experience within the administrative system. These include further training and knowledge exchange between the authorities, as well as between authorities and project developers (Koch et al. 2025). Establishing project-specific coordination formats between permitting authorities, administrative departments, and relevant ministries has also been suggested as a way to evaluate the status of individual projects and jointly develop solutions for complex cases (Koch et al. 2025). Sixth, binding deadlines for expert statements from involved bodies could be introduced (Koch et al. 2025). Finally, further measures discussed in the literature include increasing transparency when legal requirements change and providing more guidance documents for authorities and developers (Koch et al. 2025). More transparency has also been suggested in specific areas of the approval process, such as military air traffic control.

Beyond the administrative permitting stage, additional improvements could include strengthening the capacity of courts in order to shorten the duration of legal proceedings (Koch et al. 2025). Moreover, incorporating provisions on future repowering into land lease agreements could facilitate the later replacement of turbines and therefore be included as a standard (Koch et al. 2025).

Approvals: quality & conditions

Beyond the duration of approval procedures, the quality and conditions attached to permits are also crucial. Even when permits are granted, restrictive conditions can delay or prevent the practical realisation of projects:

“The question is whether the permits that are issued actually lead to projects being implemented quickly. It is not only about quantity, but also about quality. From our perspective, many permits are so restrictive that they are currently not or hardly implementable. For example, we had to take a case to the administrative court in order to make them usable at all” (EWS).

A key issue in this context concerns the interpretation of legal requirements by approval authorities, which, at the moment, are often differing and sometimes unfavourable, e.g. regarding noise or species protection evaluations (MV; EWS; (Koch et al. 2025). Greater standardisation, clearer guidelines, and a supportive interpretation of regulations could increase planning certainty and enable more wind turbines (EWS). In recent years, the state has already developed practice guidelines and administrative decrees that support more uniform interpretations (UM). This process is ongoing - current discussions focus on issues such as night-time operation and noise emissions. This also happens at the national level in working groups such as the *Bund/Länder-Arbeitsgemeinschaft für Immissionsschutz* (UM).

Environmental and species protection regulations also play an important role in shaping approval conditions for which many aspects are covered by national law (Koch et al. 2025). Regional authorities have developed guidance documents for project developers and administrative bodies to handle those national regulations and fill in gaps - for example information papers on birds or guidance on bats (Koch et al. 2025).

Finally, individual persons play a key role: If the leadership of an approval authority takes a supportive stance towards wind energy, procedures often proceed more smoothly. For that, administrative staff require increased institutional backing from higher administrative levels in the state, particularly when facing potential legal disputes (MV).

Further aspects

Another area in which the state government has sought to facilitate action concerns questions related to the electricity grid and grid connection by supporting coordination among relevant actors. It initiated a Memorandum of Understanding on the integration of renewable energies into the electricity grid, which was signed by representatives of regional planning authorities, economic actors, grid operators, and administrative bodies. The memorandum outlines joint intentions, for example regarding the potential overbuilding of grid connection points (Umweltministerium BW 2023). Such initiatives illustrate how the state can act as a facilitator even in policy areas where its direct regulatory competencies are limited.

Make action economically viable: Economic Instruments

Compared to other regions in Germany, the construction of wind turbines in the state is often associated with higher costs due to topography, wind characteristics and grid connection (Koch et al. 2025; EWS; MV; MS). This means that projects generally require higher revenues, around 9 ct/kWh according to project developers, in order to become economically viable (TT). This leads to the question whether and how the state can support project developers economically beyond trying to influence the design of the national EEG as outlined above.

Financing

Wind projects are typically capital-intensive and therefore highly sensitive to interest rates (Koch et al. 2025; TT). A small reduction in lending rates could have a substantial impact, particularly as remuneration levels under the EEG are declining (TT). One instrument at the state level could therefore be the provision of favourable financing conditions such as low-interest loans by the state bank (TT; MS; L-Bank BW 2025). Targeted financing instruments could focus on development or infrastructure costs, thereby improving the economic viability without replacing the EEG framework (MS). However, the scope for state-level intervention in project financing seems to be limited. National public banks already provide low-interest loans for renewable energy projects, reducing the additional impact of state-level instruments (MV). Furthermore, subsidies adding on the EEG could raise concerns under European state aid law (MS; UM). In view of these uncertainties and the outstanding reform of the EEG, the state government currently refrains from introducing additional financial support instruments (UM).

Leasing conditions for state-owned forest areas

A frequently discussed state-level economic lever concerns the leasing conditions on state-owned forest land. In Baden-Württemberg, this is managed by ForstBW, which allocates sites for wind energy projects through competitive tendering procedures. In these, bids include proposed lease payments, a variable revenue share and other criteria like citizens' participation. However, the offered lease payment seems to be the decisive factor in the allocation of sites (Koch et al. 2025; TT) which has led to very high lease commitments. These are often made at an early stage of the project, when other key parameters remain uncertain (TT). Thus, the business case for the project can later collapse despite already concluded land-use agreements as has already happened on some occasions (MV; TT; MS). Another effect mentioned is a broader market impact: The public communication of very high lease revenues per turbine by ForstBW creates expectations among other landowners, which can lead to rising lease demands across the entire market (TT). Representatives of the state administration emphasised that, as a public landowner, the state is generally obliged to manage its assets economically and allocate land through transparent competitive procedures (UM). One proposal discussed is giving more weight to financial participation models. Such a model could lower upfront project costs while still enabling the state to participate financially in successful projects (TT). Some experts proposed revising the auction design for state forest sites so that additional criteria such as citizen participation play a stronger role alongside purely financial considerations like, e.g., in Bavaria (Koch et al. 2025; Schmidt et al. 2022; MV). However, the extent to which such reforms are legally feasible remains uncertain in the existing literature and interviews revised.

Mandatory financial participation of municipalities or local actors

Financial participation of neighbouring municipalities in the revenues generated by wind turbines has already been outlined on page 28. Following the same idea, alternative participation mechanisms are discussed. These may include discounted electricity prices for residents, financial support for regional institutions, savings bonds linked to wind projects, or opportunities for direct investment through citizen energy cooperatives. Those are widely seen as potentially important instruments for strengthening local acceptance and support (Koch et al. 2025); MS). For the project developers however, they may represent an additional financial burden without significant countervalue (TT, see also page 28).

Motivate & enable action: Education, Campaigns & Other

The public debate on wind energy is often influenced by polarisation, emotionality, questions of (local) identity, persistent myths and misinformation (MS). Clear and credible communication by the state, trusted regional representatives or public figures can therefore help explaining the benefits of wind energy, contextualise potential impacts and present it as a “community project” (MV; MS). Systematic public relations work is considered important for strengthening acceptance not only of wind energy itself but also of related infrastructure such as electricity grid expansion (Koch et al. 2025; MS).

Another relevant field concerns education, training and workforce development of qualified specialists, including engineers, planners and service technicians. While Baden-Württemberg already has relevant higher education programmes, such as a wind energy study program, there still is a shortage in certain professional groups (MS). The state can support such initiatives through its education policy but did not actively do so in the context of wind energy (MS).

Enable evidence-based action: Research & Innovation

In this category, neither the expert interviews nor the reviewed literature identified major additional policy measures at the state level specifically aimed at accelerating wind energy expansion. This suggests that the central challenges in this field currently lie less in a lack of knowledge or technological development and more in the practical implementation of existing solutions.

Direct Implementation

The only mentioned potential avenue would be to use the state’s majority shareholding in EnBW to strategically influence investment decisions in wind power. In practice, however, this channel of influence appears to be limited. As a publicly listed company, EnBW operates under the logic of capital markets: Corporate decisions are guided by economic considerations. Accordingly, the supervisory and decision-making bodies’ focus lies on the company’s economic performance rather than on implementing energy policy objectives. In the context of this thesis, it remains unclear whether stronger strategic influence could in principle be exercised in this context (MS).

6.4 Evaluation and Priority Measures

Figure 9: Evaluations of wind energy expansion in Baden-Württemberg by experts



Note: As part of the government, the interviewees of the UM did not present a rating.
Source: Own Illustration.

Overall Assessment of Wind Energy Expansion in Baden-Württemberg

There is broad agreement that Baden-Württemberg is currently not on track to meet its wind energy expansion target for 2030, and that achieving this goal under current conditions would be extremely challenging. Regarding the 2040 target, interviewees were generally more cautious, but suggested that it might still be achievable, if the recently implemented measures take effect as expected or if additional decisive actions are taken (MV; MS: UM; TT). At the same time, they highlighted that this is highly contingent on how national economic framework conditions in the EEG are shaped now and after 2026 (UM; TT; MS; MV).

A key issue highlighted in multiple interviews is the gap between planning and permitting on the one hand and the actual implementation of projects on the other. On paper, the development pipeline appears promising: If all planned projects were realized, they would cover the state’s expansion targets (MS). In practice, however, many projects do not progress to construction due to several reasons, including the reluctance of municipal landowners to lease land, high investment costs, and restrictive permit conditions (TT). As one interviewee summarized: “What good is it if a permit or a usage agreement is sitting in a drawer? It doesn't contribute to megawatt hours and CO₂ savings. It's just sitting in a drawer. It only binds up resources” (TT).

The establishment of the Wind Energy Task Force in 2021 and the subsequent policy measures were assessed positively by all interviewees. In particular, the accelerated permitting procedures, steps toward standardisation, and improvements in spatial planning frameworks (MS; MV; UM).

Overall, the interviews present a differentiated evaluation: On the one hand, Baden-Württemberg has made noticeable progress in spatial planning, permitting procedures, and project development, resulting in a larger pipeline of potential wind projects than ever before. On the other hand, the actual implementation of wind energy projects continues to lag significantly behind what would be required to meet the state’s climate and energy targets, particularly for 2030.

Prioritisation of Policy Measures for Wind Energy Expansion

Considering the projected shortfall in wind power expansion, the question arises which policy measures the state should prioritise and which measures may be of lower impact for which the interviews provide a relatively consistent picture.

First, the economic framework currently seems to be the most decisive factor for accelerating expansion. Consequently, the state government should actively advocate at the national level for an adaptation of the EEG that enables economically viable wind energy development in southern Germany (MS; TT; MV). Second, at the state level, interviewees highlighted the importance of further improving approval procedures. Additional digitalisation, standardisation and administrative streamlining could significantly reduce planning costs for developers (MS; TT; MV) and enable them to apply for EEG bonuses earlier, leading to higher national subsidies (TT). This includes more consistent and favourable interpretation of regulatory requirements (TT; UM). Third, the provision of state-owned forest was frequently mentioned as an important lever. Adjusting leasing procedures could make such areas more economically viable for wind energy development (MS; MV; TT; UM). Fourth, interviewees stressed the importance of the quality of spatial planning, including the areas' suitability in terms of wind conditions, infrastructure costs and access to grid connection points. Ensuring that regional planning designates sites with favourable conditions therefore remains an important task for the state (TT; MV). Fifth, having a quick effect, financial instruments like low-interest loans were identified as a potentially powerful lever (TT). Even relatively small reductions in financing costs could significantly improve the economic viability of projects and enable developers to submit more competitive bids (Koch et al. 2025). However, within the scope of this work it remains unclear to what extent such measures would be permissible under state aid rules. Sixth, interviewees highlighted the role of communication of wind energy targeting civil society as well as municipalities. A more proactive positive communication strategy could help to facilitate the expansion of wind energy (MS; MV; UM).

In contrast, some measures were considered helpful but likely to have comparatively lower impact. For example, qualification programmes for the wind energy sector were viewed as important in principle but unlikely to address the current bottlenecks in project implementation (TT; MV; MS). Similarly, the simple expansion of staff in permitting authorities was not seen as a decisive lever, stating that organisational processes and administrative practices may be more relevant (TT).

Finally, mandatory financial participation for municipalities or local communities was assessed differently among interviewees. While some emphasised its potential contribution to local acceptance (MS; MV), others doubted its effectiveness (TT).

7. Discussion

The case of wind energy expansion in Baden-Württemberg illustrates several broader insights for the analytical framework developed in this study. First, the categorisation of possible state actions proves useful for systematically analysing existing and proposed policy measures. It provides a structured way to map the different instruments available to state governments and to reflect on potential additional measures within each category. Second, the wind energy case illustrates that policy implementation involves numerous actors and complex institutional processes, while being strongly shaped by national framework conditions which differs considerably between policy fields. A general categorisation of state instruments, such as the framework developed in this study, provides a useful analytical structure but must always be complemented by an understanding of the specific institutional context. This also suggests that a more detailed universal categorisation of state instruments may be difficult to achieve, as concrete policy options remain highly sector specific. Third, the case study highlights that policy outcomes are not determined solely by formal regulations but also by their practical implementation. Even when the legal framework is fixed, the way rules are interpreted and applied by administrative authorities can significantly influence practice. Fourth, in the wind energy case, the state's scope for action appears more limited in areas such as economic instruments or binding regulation. In contrast, states often possess greater flexibility in areas, such as administrative coordination, planning procedures, information provision, capacity building, or the facilitation of cooperation between actors. The extend to which limitations exist, however, vastly vary depending on the policy field. In each field, however, the principle of connectivity may create disincentives for states to impose legally binding obligations on municipalities (Eckersley et al. 2021) leading to a tendency of states to rely on indirect steering mechanisms rather than binding regulatory instruments.

A further observation emerging from the interviews is that non-governmental actors often have limited clarity about the actual scope of action available to state governments. This can influence expectations regarding possible policy changes and highlights the importance of transparent communication about the distribution of responsibilities within multi-level governance systems. This also affects this thesis as the interviews partly stated insecurity about the states opportunities or had differing assessments of the possibilities. In these areas, further research is needed – especially regarding financial instruments in the face of state aid law.

Finally, this study does not systematically analyse the political feasibility of individual measures. Such aspects have only been considered indirectly by focusing on measures proposed in expert interviews and the existing literature, thereby excluding options that may be legally possible but are widely regarded as politically unrealistic. Assessing feasibility given the current political circumstances would require a broader analysis of political dynamics.

8. Conclusion & Outlook

This thesis set out to analyse the opportunities for state-level climate action within the German federal system by developing a conceptual framework of state policy levers and applying it to the case of wind energy expansion in Baden-Württemberg. The analysis yields insights into both the current state of wind energy development in the state and the broader role of subnational governments in climate governance.

A key observation on wind energy expansion is that the central bottleneck currently lies in the economic viability of projects. In particular, the design of the national EEG is decisive in determining whether wind energy projects in southern Germany are financially feasible. The state government can influence this only indirectly through political advocacy. Within its own authority, the state could improve project viability by redesigning the leasing procedures for state-owned forest land. Further research, however, is needed to explore whether and how the state could support wind projects financially while remaining compliant with European state aid regulations.

Beyond financial conditions, administrative procedures remain an important lever for state action. Further simplification, standardisation, and digitalisation of approval procedures could reduce planning risks and transaction costs for developers. In particular, a more consistent interpretation and application of existing regulations across permitting authorities could enable faster and higher quality approvals.

The analysis also highlights the importance of public and political discourse surrounding wind energy. Given the often polarised debates on wind projects, proactive and transparent communication by the state government is crucial. Considering the recent elections in Baden-Württemberg, the next government will need to improve both supportive policy frameworks and public engagement to ensure momentum in wind energy expansion.

Beyond the case study, this thesis has developed a conceptual framework for analysing state-level climate mitigation levers. The framework proved useful as an analytical tool for structuring the investigation of measures available to the state. However, the case study demonstrated that it must be complemented by the political and institutional conditions specific to each policy field, including questions of political feasibility. As the framework was developed using climate mitigation measures addressing the energy transition, its applicability to other sectors remains to be tested. Future research could therefore apply the framework in additional policy fields or other federal states to further evaluate and refine its analytical usefulness.

Overall, the findings underscore that, while key economic and regulatory conditions for the energy transition are determined at the national level, states play a crucial role in shaping the conditions of implementation and need to make use of the levers available to them to bring forward climate mitigation.

References

- Behnke, Nathalie; Kropp, Sabine (2025): Verwaltungsföderalismus. In : Öffentliche Verwaltung in Deutschland: Springer VS, Cham, pp. 37–53. Available online at https://link.springer.com/chapter/10.1007/978-3-031-43143-2_3, checked on 17/2/2026.
- Bloquet, Calixte; Carstensen, Franziska (2024): Members of the German Bundesrat: (How/Who/From Where) Do they represent? In : Jahrbuch des Föderalismus 2024, pp. 246–259. Available online at <https://www.nomos-elibrary.de/en/document/view/pdf/uuid/ea3c6161-8457-3c2e-8f9b-d44f7d8fd8d8?page=1>, checked on 19/12/2025.
- BNetzA (2026): Statistiken: Windenergieanlagen an Land - Ausschreibungen. Bonn. Available online at https://www.bundesnetzagentur.de/DE/Fachthemen/ElektrizitaetundGas/Ausschreibung/gen/Wind_Onshore/BeendeteAusschreibungen/start.html, updated on 8/1/2026, checked on 15/3/2026
- Eckersley, Peter; Kern, Kristine; Haupt, Wolfgang et al. (2021): The multi-level context for local climate governance in Germany: The role of the federal states. In *IRS Dialog* (3), pp. 1–208. Available online at <https://leibniz-irs.de/fileadmin/userupload/Transferpublikationen/2021/IRSDialogmultilevelgovernance.pdf>, checked on 22/12/2025.
- Fenna, Alan; Jodoin, Sébastien; Setzer, Joana (2024): Föderalismus und Klima-Governance: eine Übersicht. In : Jahrbuch des Föderalismus 2024, pp. 37–50. Available online at <https://www.nomos-elibrary.de/en/document/view/pdf/uuid/fcac9378-2978-39cb-9827-fd1a9923d460?page=3>, checked on 18/12/2025.
- GG (2025): GG - Grundgesetz für die Bundesrepublik Deutschland. Available online at <https://www.gesetze-im-internet.de/gg/BJNR000010949.html>, checked on 1/1/2026.
- Hager, Carol; Stefes, Christoph H. (Eds.) (2016): Germany's Energy Transition. New York: Palgrave Macmillan US. Available online at <http://ndl.ethernet.edu.et/bitstream/123456789/58554/1/7.pdf.pdf#page=63>, checked on 22/12/2025.
- KEA BW (n.d.): Regionale Energieagenturen. Available online at <https://www.kea-bw.de/kommunaler-klimaschutz/regionale-energieagenturen>, updated on 3/16/2026, checked on 16/3/2026.
- Kelm, Tobias; Bickel, Peter; Jachmann, Henning; Liebhart, Laura; Bergk, Fabian; Fehrenbach, Horst et al. (2022): Sektorziele 2030 und klimaneutrales Baden-Württemberg 2040. DOI: 10.24406/publica-178, checked on 1/3/2026.

KlimaG BW (2/11/2023): Klimagesetz Baden-Württemberg. Available online at <https://www.landesrecht-bw.de/bsbw/document/jlr-KlimaSchGBW2023rahmen>, checked on 19/12/2026.

Koch, Matthias; Vogel, Moritz; Schütte, Silvia; Hoesch, Sarah; Krieger, Susanne; Bauknecht, Dierk; Kälble, Janina (2025): Beschleunigung des Windenergieausbaus in Baden-Württemberg. Hemmnisse und Lösungsvorschläge. Freiburg. Available online at https://www.ews-schoenau.de/export/sites/ews/ews/presse/.files/Kurzstudie_Windausbau_BaWue_final.pdf, checked on 17/12/2025.

Landtag BW (2025): Drucksache 17 / 8424. Available online at https://www.landtag-bw.de/resource/blob/560598/20b6dcc8c64c91fbcf7022fc4e77a172/17_8424_D.pdf, checked on 2/3/2026, checked on 10/3/2026.

L-Bank BW (2025): Merkblatt Energiefinanzierung. Available online at https://formulare.virtuelles-rathaus.de/servlet/de.formsolutions.FillServlet?param1=08212000-01-0064&query=1&knr=08212000-01&template=KF778664LB&print=1&direktstart=1&save=1&reset=1&consent_type=NONE&v=g.pdf, checked on 16/3/2026.

LUBW (2026): Arbeitsmappe: Stand des Windenergieausbaus. Available online at https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://umweltdaten.lubw.baden-wuerttemberg.de/repositories/energie_windenergie,7C1pAhtTDpA00YwQGcVz/workbooks/Stand-des-Windenergieausbaus,HVkeV1PiHZnNuLxtOLvS/worksheets/Dashboard-Windenergieausbau,cGEXqcxsY7hw87gLB2P8%3FworkbookHash%3Dxru6H2V9ZOd8cwY5zSVuEGH8rSgLuDretsR7DJh-uR-Zly31%26embeddingTargetId%3Dwindenergieausbau%2529&ved=2ahUKEwjDmehv3KaTAxWygf0HHeE6IG8QFnoECBgQAQ&usg=AOvVaw22oJNrgJWc15Vt_ugKb7VL, updated on 2/9/2026, checked on 12/2/2026.

Müller, Carla; Laroze, Bénédicte; Frey, Michael (2024): Between EU Requirements and Local Initiative: The Local Energy Transition in Germany and France. In *Local Energy Transitions in Europe* 89, pp. 145–171. DOI: 10.1007/978-3-031-67766-3_7, checked on 8/3/2026.

Ohlhorst, Dörte (2015): Germany's energy transition policy between national targets and decentralized responsibilities. In *Journal of Integrative Environmental Sciences* 12 (4), pp. 303–322. DOI: 10.1080/1943815X.2015.1125373, checked on 1/1/2026.

RegP BW (2026): Fördergrundsätze „Kleine Wasserkraft“. Available online at <https://rp.baden-wuerttemberg.de/themen/wirtschaft/foerderungen/fb87/wasserkraft/>, checked on 15/12/2025.

Schmidt, Maike; Schindler, Dirk; Arneth, Almut; Kesselring, Sven; Löbke, Sabine; Pehnt, Martin (2022): Klima-Maßnahmen-Register: Stellungnahme des Klima-Sachverständigenrats. Stellungnahme zum Startdokument des Klima-Maßnahmen-Registers. Available online at <https://publikationen.reutlingen-university.de/frontdoor/deliver/index/docId/5128/file/5128.pdf>, checked on 20/12/2025.

Schmidt, Maike; Schindler, Dirk; Arneth, Almut; Kesselring, Sven; Pehnt, Martin (2025): Baden-Württembergs Beitrag zur Windenergie-Komplementarität in Deutschland. Impulspapier. Klima-Sachverständigenrat Baden-Württemberg. Stuttgart. Available online at https://um.baden-wuerttemberg.de/fileadmin/redaktion/m-um/intern/Dateien/Dokumente/4_Klima/Klimaschutz/Klima-Sachverstaendigenrat/251130-KSVR-Impulspapier-Komplementaritaet.pdf, checked on 6/2/2026.

Schönberger, Philipp; Reiche, Danyel (2016): Why Subnational Actors Matter: The Role of Länder and Municipalities in the German Energy Transition. In Carol Hager, Christoph H. Stefes (Eds.): Germany's Energy Transition. New York: Palgrave Macmillan US, pp. 27–61. Available online at https://link.springer.com/chapter/10.1057/978-1-137-44288-8_2, checked on 11/3/2026.

Staatsministerium Baden-Württemberg (2022): Ausbau der Windkraft weiter beschleunigen. Stuttgart. Available online at <https://www.baden-wuerttemberg.de/de/service/alle-meldungen/meldung/pid/ausbau-der-windkraft-weiter-beschleunigen>, checked on 14/3/2026.

Staatsministerium BW (2023): Solare Stromerzeugung auf rund 260 straßennahen Flächen. Available online at <https://www.baden-wuerttemberg.de/de/service/presse/pressemitteilung/pid/solare-stromerzeugung-auf-rund-260-strassennahen-flaechen>, checked on 14/3/2026.

Steinbach, Jan; Deurer, Jana; Haller, Johannes, Popovski, Eftim, Decker, Alexandra, Bei der Wieden, Malte; Jansen, Luca Lena (2024): Klimaschutz-und Projektionsbericht Baden-Württemberg 2024. Available online at https://beteiligungsportal.baden-wuerttemberg.de/fileadmin/redaktion/m-um/intern/dateien/dokumente/4_klima/klimaschutz/kmr/20241021-bericht-projektionen-bw.pdf, checked on 20/12/2025.

STMUV Bayern (2022): Das Bayerische Klimaschutzprogramm. ein integriertes Klimaaktionsprogramm (Klimaschutz, Klimaanpassung, Klimaforschung). Available online at https://www.stmuv.bayern.de/themen/klimaschutz/klimaschutzgesetz/doc/klimaschutzprogramm_2022.pdf, checked on 13/3/2026.

Umweltministerium BW (2023): Memorandum of Understanding zur Netzintegration erneuerbarer Energien in Baden-Württemberg. Ministerium für Umwelt, Klima und Energiewirtschaft Baden-Württemberg. Stuttgart. Available online at https://um.baden-wuerttemberg.de/fileadmin/redaktion/m-um/intern/Dateien/Dokumente/5_Energie/Versorgungssicherheit/20230911-MoU-Netzintegration-erneuerbare-Energien-Baden-Wuerttemberg.pdf, checked on 10/3/2026.

Umweltministerium BW (2024): Energiekonzept für Baden-Württemberg. Available online at https://um.baden-wuerttemberg.de/fileadmin/redaktion/m-um/intern/Dateien/Dokumente/2_Presse_und_Service/Publikationen/Energie/Energiekonzept-fuer-Baden-Wuerttemberg.pdf, checked on 11/12/2025.

Umweltministerium BW (2025): Klimaneutrale Landesverwaltung. Available online at <https://um.baden-wuerttemberg.de/de/klima-energie/klimaschutz/klimaneutrale-landesverwaltung>, updated on 3/16/2026, checked on 14/3/2026.

WindBG (2022): Windenergieflächenbedarfsgesetz. Available online at <https://www.gesetze-im-internet.de/windbg/WindBG.pdf>, checked on 10/2/2026.

Appendix A :Table of Current and Potential Measures in Baden-Württemberg

Cluster	Measure	Sector	Instrument Type	Target Level	Effectiveness	Implementation Status BW	Reference(s)	Impact Pathway	KMR ID
provision of space for renewable Energy	Adjustment of property taxes for ground-mounted solar installations	Electricity Transition	Economic Instruments Planning & Strategic Instruments	Companies & Economic Actors	Medium	Not Implemented	Kelm et al, 2023	Renewable Electricity Expansion	
	Masterplan on geothermal energy	Cross-cutting		Various/All	Medium	Not Implemented	STMLUV Bayern 2022	Renewable Energy Expansion	
	Leasing of state-owned land for wind energy (by ForstBW)	Electricity Transition	Economic Instruments	Companies & Economic Actors	Medium	Partly Implemented	Schmidt et al, 2022; Koch et al, 2025	Renewable Energy Expansion	
	Subsidy program for hydropower plants	Electricity Transition	Economic Instruments	Companies & Economic Actors	Medium	Partly Implemented	STMLUV Bayern 2022	Renewable Energy Expansion	
	higher demands to renovation measures and building	Heat Transition	Regulatory Instruments	Various/All	High	Not Implemented	Kelm et al, 2023	Reduced Energy/Heat Demand	
	Ensure financial participation in wind energy and ground-mounted PV systems	Electricity Transition	Economic Instruments; Regulatory Instruments	Municipalities / Regional Authorities	Medium	Planned	Kelm et al, 2023	Renewable Electricity Expansion	
	Decarbonization of heating grids	Heat Transition	Regulatory Instruments, Planning & Strategic Instruments	Municipalities / Regional Authorities, Companies & Economic Actor	Medium	Not Implemented	Kelm et al, 2023 Eckersley et al, 2021,	Fuel switch	
	Energy report as a mandatory municipal task	Cross-cutting	Regulatory Instruments	Municipalities / Regional Authorities	High	Implemented	KlimaGBW §18	Various	
	Obligatory participation of municipalities on the income of renewable energy plants	Electricity Transition	Regulatory Instruments	Various/All	Medium	Not Implemented	Schmidt et al, 2023	Renewable Energy Expansion	
	Aligning support programs with climate neutrality	Heat Transition	Economic Instruments	Various/All	Medium	Partly Implemented	KMR	Reduced Energy/Heat Demand, Various	206
Supporting the fuel switch from gas to hydrogen in the power plant sector	Efficient use of living space	Heat Transition	Other/All	Various/All	Medium	Implemented	KMR	Reduced Energy/Heat Demand	226
	Supporting the fuel switch from gas to hydrogen in the power plant sector	Cross-cutting	Informational & Supporting Instruments	Companies & Economic Actors	Medium	Implemented	KMR	Fuel switch	169
	Conclusion of a public law contract for the long-term financing of regional structures (regional energy agencies, REAs)	Cross-cutting	Informational & Supporting Instruments	Various/All	High		KMR	Various	438
	State government's digitalization strategy digital.LÄND: Sustainability as one of the strategy's four overarching goals	Cross-cutting	Planning & Strategic Instruments	State institutions	Low	Decided on	KMR	Various	50

Appendix A :Table of Current and Potential Measures in Baden-Württemberg

Cluster	Measure	Sector	Instrument Type	Target Level	Effectiveness	Implementation Status BW	Reference(s)	Impact Pathway	KMR ID
	Housing promotion program “Housing Construction BW 2022”	Heat Transition	Economic Instruments	Municipalities / Regional Authorities, Private Households, Companies & Economic Actors	Medium	Implemented	KMR	Reduced Energy/Heat Demand	29
	Green Hydrogen Model Region Funding Program (EFRE)	Electricity Transition	Economic Instruments	Various/All	Medium	Implemented	KMR	Energy Infrastructure Expansion/Optimisation	284
	Urban development funding	Cross-cutting	Economic Instruments	Municipalities / Regional Authorities	High	Implemented	KMR	Reduced Energy/Heat Demand, Various	28
	Implementation of a regional planning initiative to achieve the target of at least 2 percent of the respective region's area being used for wind energy and ground-mounted photovoltaics, and to implement the corresponding planning mandate for regional associations in Sections 20 and 21 of the Climate Protection Act of Baden-Württemberg (KlimaG BW).	Electricity Transition	Planning & Strategic Instruments	Companies & Economic Actors, Municipalities / Regional Authorities	High	Planned	KMR	Renewable Energy Expansion	26
	Change to the Baden-Württemberg Climate Protection and Climate Change Adaptation Act to implement EU and national law (especially in the areas of energy efficiency and heat planning)	Cross-cutting	Regulatory Instruments	State institutions, Municipalities / Regional Authorities	High	Partly Implemented	KMR	Various	418
Municipal Heat Planning	Connectivity payments to municipalities for heating planning	Heat Transition	Economic Instruments	Municipalities / Regional Authorities	Medium	Implemented	KMR	Fuel switch, Renewable Heat Expansion	396
	Climate-friendly measures in the area of student housing	Heat Transition	Informational & Supporting Instruments, Regulatory Instruments	Science, Research & Education, Municipalities / Regional Authorities, Companies & Economic Actors	Medium	Implemented	KMR	Reduced Energy/Heat Demand, Fuel Switch	303
	Notice on the priority of consideration for heating networks and facilities feeding into them	Heat Transition	Informational & Supporting Instruments	Municipalities / Regional Authorities	Low	Implemented	KMR	Renewable Energy Expansion	422
	Revision of the State Development Plan (Landesentwicklungsplan) / Strengthening climate protection in spatial planning	Cross-cutting	Planning & Strategic Instruments	Municipalities / Regional Authorities	Medium	Planned	KMR	Various	25

Appendix A :Table of Current and Potential Measures in Baden-Württemberg

Cluster	Measure	Sector	Instrument Type	Target Level	Effectiveness	Implementation Status BW	Reference(s)	Impact Pathway	KMR ID
Municipal Heat Planning	Co-financing of IPCEI hydrogen projects in Baden-Württemberg	Electricity Transition	Economic Instruments	Companies & Economic Actors	Medium	Implemented	KMR	New Technologies	287
	Support and controlling of the power grid expansion	Electricity Transition	Planning & Strategic Instruments	Companies & Economic Actors, Civil Society, Municipalities / Regional Authorities	Medium	Implemented	KMR	Energy Infrastructure Expansion/Optimisation	189
	Transformation of gas networks	Cross-cutting	Regulatory Instruments	Bundesrat / Nation	High	Not Implemented	KMR	Energy Infrastructure Expansion/Optimisation	420
	Supporting and implementing the phase-out of coal in the state	Electricity Transition	Informational & Supporting Instruments	Companies & Economic Actors	Medium	Partly Implemented	KMR	Fuel switch	197
	provision of space for renewable Energy	Electricity Transition	Planning & Strategic Instruments	Municipalities / Regional Authorities, Companies & Economic Actors	Medium	Implemented	KMR	Renewable Energy Expansion	187
	Ensuring security of supply	Cross-cutting	Planning & Strategic Instruments	Various/All	Medium	Implemented	KMR	Various	198
	Supplementary financing for efficient heating grids	Heat Transition	Economic Instruments	Companies & Economic Actors	Medium	Partly Implemented	Schmidt et al., 2022	Energy Infrastructure Expansion/Optimisation	
	Support of an innovation centre for Green Tech	Cross-cutting	Economic Instruments	Science, Research & Education, Companies & Economic Actors	Low	Implemented	KMR	New Technologies	73
	Erneuerbare-Wärme-Gesetz (EWärmeG),	Heat Transition	Regulatory Instruments	Various/All	High	expired/ended	Schmidt et al., 2022	Various	
	Support for energy consulting for households	Heat Transition	Informational & Supporting Instruments	Private Households	Medium	Implemented	KMR	Reduced Energy/Heat Demand	214
	Informationsflyer mit Handwerk BW	Cross-cutting	Information und Beratung	Private Households	Medium	Implemented	KMR	Reduced Energy/Heat Demand, Renewable Energy Expansion, Fuel Switch	459
	Support for municipal heat planning	Heat Transition	Informational & Supporting Instruments	Municipalities / Regional Authorities	Medium	Implemented	KMR	Fuel switch, Renewable Heat Expansion	207
	Establishment of “Erneuerbare BW” and continuation of the tasks of “Erneuerbare BW”	Electricity Transition	Informational & Supporting Instruments, Cooperation & Coordination Instruments	Various/All	Medium	Implemented	KMR	Renewable Energy Expansion	398
	Appointment of an expert council on climate change	Cross-cutting	Consulting & Participation	State institutions	Medium	Implemented	Schmidt et al., 2022	Various	

Appendix A :Table of Current and Potential Measures in Baden-Württemberg

Cluster	Measure	Sector	Instrument Type	Target Level	Effectiveness	Implementation Status BW	Reference(s)	Impact Pathway	KMR ID
Approval process for Renewable Energy Plants	Continuous discussion of energy efficiency measures for buildings in use with the State Agency for Property and Construction	Heat Transition	Cooperation & Coordination Instruments	State institutions	Low	Implemented	KMR	Reduced Energy/Heat Demand	108
	Examination of energy optimization options for government buildings in use in cooperation with the State Property and Construction Agency	Heat Transition	Other/All Regulatory Instruments, Informational & Supporting Instruments	State institutions	Low	Implemented	KMR	Reduced Energy/Heat Demand	111
	Simpler and faster approval process for wind turbines	Electricity Transition		Companies & Economic Actors	Medium	Partly Implemented	Koch et al, 2025	Renewable Energy Expansion	
	Simplification / acceleration of approval procedures for renewable energy plants	Electricity Transition	Regulatory Instruments	Various/All	Medium	Partly Implemented	Schmidt et al., 2022	Renewable Energy Expansion	
Climate neutral state administration	Continuation and implementation of the climate-neutral state administration concept	Cross-cutting	Planning & Strategic Instruments	State institutions	Medium	Implemented	KMR	Various	200
Climate neutral state administration	Climate neutral state administration until 2030	Cross-cutting	Regulatory Instruments	State institutions	Medium	Implemented	Schmidt et al., 2022; KlimaG BW	Reduced Energy/Heat Demand, Fuel Switch	
Municipal Heat Planning	Quality assurance of heating plans	Heat Transition	Other/All, Regulatory Instruments	Municipalities / Regional Authorities	Medium	Not Implemented	Schmidt et al, 2023	Fuel switch, Renewable Energy Expansion	
Municipal Heat Planning	Municipal heat planning: consideration of space requirements for climate-friendly heat generation	Heat Transition	Planning & Strategic Instruments, Regulatory Instruments, Informational & Supporting Instruments	Municipalities / Regional Authorities	Medium	Partly Implemented	KMR	Renewable Energy Expansion	209
		Heat Transition	Informational & Supporting Instruments	Municipalities / Regional Authorities	Medium	Not Implemented	Schmidt et al, 2023	Renewable Energy Expansion, Fuel Switch	
		Heat Transition	Regulatory Instruments	Municipalities / Regional Authorities	High	Implemented	Schmidt et al., 2024	Fuel switch, Renewable Heat Expansion	
		Heat Transition	Regulatory Instruments	Various/All	High	Partly Implemented	Schmidt et al., 2022	Renewable Energy Expansion	
provision of space for renewable Energy	Securing areas for renewable heat production	Heat Transition	Regulatory Instruments, Planning & Strategic Instruments	Various/All	Medium	Partly Implemented	Schmidt et al, 2023	Renewable Energy Expansion	
Municipal Heat Planning	Establishment and maintenance of a comprehensive advisory structure to provide needs-based support for the creation and implementation of municipal heating plans	Heat Transition	Informational & Supporting Instruments	Municipalities / Regional Authorities	Medium	Implemented	KMR	Renewable Energy Expansion	222

Appendix A :Table of Current and Potential Measures in Baden-Württemberg

Cluster	Measure	Sector	Instrument Type	Target Level	Effectiveness	Implementation Status BW	Reference(s)	Impact Pathway	KMR ID
	Support for energy research	Electricity Transition	Economic Instruments	Science, Research & Education, Companies & Economic Actors	Medium	expired/ended	KMR	New Technologies	84
	Including renewable heat and energy in school framework curricula	Cross-cutting	Education & Campaigns	Civil Society		Not Implemented	Schönberger & Reiche, 2016	Various	
provision of space for renewable Energy	wind energy team set up by the state forestry commission	Electricity Transition	Planning & Strategic Instruments	State institutions	Medium	Implemented	Koch et al, 2025	Renewable Energy Expansion	
	Thematic area: Heat transition	Heat Transition	Cooperation & Coordination Instruments	Various/All	Low	Partly Implemented	KMR	Various	421
	Climate Protection Coordination Unit	Cross-cutting	Cooperation & Coordination Instruments	State institutions	Medium	Not Implemented	Kelm et al, 2023	Various	
	national influence in Federal State Energy Summit (Energieministerkonferenz (EnMK))	Cross-cutting	Cooperation & Coordination Instruments	Bundesrat / Nation	Medium	Partly Implemented	Olhorst, 2015	Various	
PV Obligation	Information and advice on the PV obligation	Electricity Transition	Informational & Supporting Instruments	Various/All	Medium	Implemented	KMR	Renewable Energy Expansion	188
Climate neutral state administration	Revision of the energy and climate protection concept for state-owned properties with the goal of achieving a climate-neutral state administration by 2030.	Cross-cutting	Planning & Strategic Instruments	State institutions	Medium	Decided on	KMR	Various	41
	PV Obligation	Electricity Transition	Regulatory Instruments	Various/All	High	Implemented	Schmidt et al, 2023	Renewable Energy Expansion	
PV Obligation	Introduction of a climate clause for new and ongoing funding programs	Cross-cutting	Economic Instruments	Various/All	High	Partly Implemented	KMR	Various	202
	mobilize funds	Cross-cutting	Economic Instruments	Various/All	High	Partly Implemented	Schmidt et al, 2023	Various	
	Corporate dialogue on the energy transition	Electricity Transition	Cooperation & Coordination Instruments	Companies & Economic Actors, Civil Society	Medium	Implemented	KMR	Various	273
	"Towards Zero GHG Emissions" – Shaping the transition to climate neutrality at business-oriented research institutes in Baden-Württemberg.	Cross-cutting	Informational & Supporting Instruments	Science, Research & Education	Low	Unclear	KMR	Various	67
	climate accords (Klimapakte) between the state government and local authority associations	Cross-cutting	Cooperation & Coordination Instruments, Economic Instruments	Municipalities / Regional Authorities	Medium	Implemented	Eckersley et al. 20211	Various	
	regionale Energieagenturen	Cross-cutting	Informational & Supporting Instruments	Various/All	High		KEA BW, n.d.	Various	

Appendix A :Table of Current and Potential Measures in Baden-Württemberg

Cluster	Measure	Sector	Instrument Type	Target Level	Effectiveness	Implementation Status BW	Reference(s)	Impact Pathway	KMR ID
	Annual issuance program "Green Bond Baden-Württemberg"	Cross-cutting	Economic Instruments	Companies & Economic Actors, Private Households	Medium	Implemented	KMR	Various	39
	Law on sustainable financial investments in Baden-Württemberg	Cross-cutting	Economic Instruments	State institutions	Medium	Implemented	KMR	Various	43
	Introduction of a CO2 shadow price	Cross-cutting	Economic Instruments	State institutions	Medium	Implemented	KMR	Various	44
	strategy dialogue on affordable housing, neighborhoods, land, planning, and innovative and ecological construction and renovation	Heat Transition	Informational & Supporting Instruments	Civil Society, Companies & Economic Actors	Low	Implemented	KMR	Various	45
	Further development of the Energy Atlas	Cross-cutting	Informational & Supporting Instruments	Various/All	Low	Implemented	KMR	Various	182
	Establishment of a clearing body	Cross-cutting	Other/All	Various/All	Medium	Not Implemented	Schmidt et al., 2022	Various	
	Visualisation and competition of climate measures	Cross-cutting	Education & Campaigns	State institutions, various/all	Low	Partly Implemented	Schmidt et al., 2022	Various	
	state staffing plan	Cross-cutting	Regulatory Instruments	Science, Research & Education, State Institutions	Medium	no official information	Schmidt et al., 2022	Various	
	Promoting a culture of transformation	Cross-cutting	Education & Campaigns	Various/All	Medium	Partly Implemented	Schmidt et al., 2023	Various	
	CO2 accounting tool "BICO2-LandBW"	Cross-cutting	Informational & Supporting Instruments	State institutions	Low	Implemented	Umweltministerium BW, 2025	Various	
	real-world laboratory "climate neutral Reutlingen (Klima-RT-LAB II)	Cross-cutting	Other	Municipalities / Regional Authorities	Low	Implemented	KMR	Various	86
	Promoting the training of environmental mentors	Cross-cutting	Education & Campaigns	Civil Society	Low	Implemented	KMR	Various	100
	Innovation Campus Sustainability (ICN)	Cross-cutting	Other	Various/All	Medium	Implemented	KMR	Various	324
	cross-departmental overall strategy	Cross-cutting	Planning & Strategic Instruments	Various/All	High	Not Implemented	Schmidt et al., 2022	Various	
	Implementation of a state heat planning	Heat Transition	Planning & Strategic Instruments	Private Households	Medium	Not Implemented	Kelm et al., 2023	Various	
	Addressing the Critical Bottleneck of Skilled Labor Availability	Cross-cutting	Planning & Strategic Instruments, Education & Campaigns	Science, Research & Education	High	Partly Implemented	Schmidt et al., 2022; Löckener et al., 2025	Various	
	Development of financing concepts for the energy transition	Electricity Transition	Planning & Strategic Instruments	Various/All	Medium	Implemented	KMR	Various	394
	implementation of an energy concept	Cross-cutting	Planning & Strategic Instruments	Various/All	Medium	Implemented	Energiekonzept BW	Various	

Appendix A :Table of Current and Potential Measures in Baden-Württemberg

Cluster	Measure	Sector	Instrument Type	Target Level	Effectiveness	Implementation Status BW	Reference(s)	Impact Pathway	KMR ID
	Improvement of the interface between universities and property and construction through the establishment of climate protection managers	Heat Transition	Regulatory Instruments	Science, Research & Education	Low	Implemented	KMR	Various	94
	Consistently align state-owned companies' with sustainability, particularly climate and species protection	Cross-cutting	Regulatory Instruments, Informational and Supporting Instruments	State institutions	Medium	Implemented	KMR	Various	42
	Support for information exchange and networking among relevant stakeholders in the field of digitalization of the energy transition and smart grids	Electricity Transition	Cooperation & Coordination Instruments, Informational and Supporting Instruments	Various/All	Medium		KMR	Energy Infrastructure Expansion/Optimisation	400
	Smart Grids-Roadmap	Electricity Transition	Planning & Strategic Instruments	Various/All	High	Implemented	Schmidt et al., 2022	Expansion/Optimisation	
	Working group on grid connection of renewable energy plants within the Renewable Energies Task Force	Electricity Transition	Cooperation & Coordination Instruments	Municipalities / Regional Authorities, Companies & Economic Actors, Civil Society	Medium	Implemented	KMR	Energy Infrastructure Expansion/Optimisation	281
	Förderprogramm CHARGE	Electricity Transition	Economic Instruments	Science, Research & Education	Low	Implemented	KMR	New Technologies, Energy Infrastructure Expansion/Optimisation	399
	Simplify and accelerate approval procedures for large heat pumps	Heat Transition	Regulatory Instruments	Companies & Economic Actors	Medium	Not Implemented	Kelm et al, 2023	Renewable Heat Expansion	
Approval process for Renewable Energy Plants	Reissue of the BW Solar Roof Space Exchange	Electricity Transition	Cooperation & Coordination Instruments	Companies & Economic Actors, Private Households	Medium	Not Implemented	Kelm et al, 2023	Renewable Electricity Expansion	
	Digital approval procedures	Electricity Transition	Regulatory Instruments	Companies & Economic Actors	Medium	Partly Implemented	Kelm et al, 2023	Renewable Electricity Expansion	
Approval process for Renewable Energy Plants	Revise requirements for soil surveys for ground-mounted solar installations	Electricity Transition	Regulatory Instruments	Companies & Economic Actors	Medium	Not Implemented	Kelm et al, 2023	Renewable Electricity Expansion	
	Addressing the import of ghg neutral energy	Electricity Transition	Other/All	Various/All	Medium	Not Implemented	Schmidt et al., 2022	Fuel switch	

Appendix A :Table of Current and Potential Measures in Baden-Württemberg

Cluster	Measure	Sector	Instrument Type	Target Level	Effectiveness	Implementation Status BW	Reference(s)	Impact Pathway	KMR ID
	Funding program: Grid-optimized photovoltaic battery storage systems	Electricity Transition	Economic Instruments	Companies & Economic Actors, Private Households	Medium	expired /ended	Eckersley et al. 2021	Energy Infrastructure Expansion/Optimisation	
	Hedging against the exploration risk for deep geothermal energy and the default risk for waste heat utilization	Heat Transition	Economic Instruments	Municipalities / Regional Authorities, Companies & Economic Actor	Medium	Not Implemented	Kelm et al, 2023	Renewable Electricity Expansion, Renewable Heat Expansion	
	Information and Advising of Municipalities on the implementation of bans on burning fossil fuels in certain areas	Heat Transition	Informational & Supporting Instruments	Municipalities / Regional Authorities	Medium	Partly Implemented	Kelm et al, 2023	Fuel switch	
	End to the burning of fossil fuels in heating systems from 2040	Heat Transition	Regulatory Instruments	Various/All	High	Not Implemented	Kelm et al, 2023	Fuel switch	
	Ban on fossil fuel-based heating systems in new buildings	Heat Transition	Regulatory Instruments	Various/All	High	Not Implemented	Kelm et al, 2023	Fuel switch	
	State strategy for gas and hydrogen grids	Cross-cutting	Planning & Strategic Instruments	Various/All	Medium	Not Implemented	Schmidt et al, 2023	Energy Infrastructure Expansion/Optimisation	
	Incentives for customers to connect to a heating network	Heat Transition	Informational & Supporting Instruments, Economic Instruments	Private Households, Companies & Economic Actors, Municipalities / Regional Authorities	Medium	Partly Implemented	Schmidt et al., 2022	Fuel switch	
	Package of measures to prepare buildings for the switch to new energy sources	Heat Transition	Other/All	Private Households, Companies & Economic Actors, Municipalities / Regional Authorities	Medium	Not Implemented	Schmidt et al., 2022, Schmidt et al., 2024	Fuel switch	
	Financing of an Information initiative on deep geothermal energy	Cross-cutting	Education & Campaigns, other, Cooperation & Coordination Instruments	Various/All	Medium	Partly Implemented	https://erneuerbare-bw.de/de/projekte/informationsinitiative-zur-tiefengeothermie	Renewable Energy Expansion	
	Climate protection-oriented restructuring of energy charges, taxes, levies, and surcharges	Electricity Transition	Economic Instruments	Various/All	High	Partly Implemented	KMR	Various	271
	Financing of training costs for energy consultants	Cross-cutting	Economic Instruments	Civil Society	Medium	Partly Implemented	Schmidt et al, 2023	Reduced Energy/Heat Demand, Fuel Switch	

Appendix A :Table of Current and Potential Measures in Baden-Württemberg

Cluster	Measure	Sector	Instrument Type	Target Level	Effectiveness	Implementation Status BW	Reference(s)	Impact Pathway	KMR ID
	Individual funding for two smart grid projects “Integer Application” and “Integer Research” as part of the digitization measure “Intelligent Energy Systems – Digitization of the Energy Transition at the Interface between Companies and Customers (INES)”	Electricity Transition	Economic Instruments	Companies & Economic Actors	Low	Implemented	KMR	Energy Infrastructure Expansion/Optimisation	193
			Informational & Supporting Instruments, Regulatory Instruments, Economic Instruments, Other						
	Strengthening geothermal energy	Cross-cutting		Various/All	Medium	Partly Implemented	Schmidt et al, 2023	Renewable Energy Expansion	
	Measures regarding municipal sewage treatment plants	Cross-cutting	Regulatory Instruments	Municipalities / Regional Authorities	Medium	Partly Implemented	Schmidt et al, 2023	Renewable Energy Expansion	
				Municipalities / Regional Authorities; Companies & Economic Actors, Private Households					
	PV on roadside areas	Electricity Transition	Regulatory Instruments		Medium	Partly Implemented	Staatsministerium BW, 2023	Renewable Energy Expansion	
	Subsidy program: Gaining space through internal development	Cross-cutting	Economic Instruments	Municipalities / Regional Authorities	Medium	Implemented	KMR	Reduced Energy/Heat Demand	27
	Implementation-oriented PV research	Electricity Transition	Other/All	Science, Research & Education	Low	Implemented	KMR	New Technologies	184
	Development of a heating concept	Heat Transition	Planning & Strategic Instruments	Various/All	Medium	Implemented	KMR	Renewable Energy Expansion, Fuel Switch	274
	State Initiative on Waste Heat	Heat Transition	Informational & Supporting Instruments	Various/All	Low	Not Implemented	Kelm et al, 2023	Renewable Energy Expansion	
	Establishment of a regulatory authority for district heating	Heat Transition	Regulatory Instruments, Other/All	Companies & Economic Actor	Medium	Not Implemented	Kelm et al, 2023	Fuel switch	
				Municipalities / Regional Authorities, Companies & Economic Actor					
	Implementation of single-buyer model for district heating	Heat Transition	Regulatory Instruments	Economic Actor	Low	Not Implemented	Kelm et al, 2023	Fuel switch	
	Waste heat concept for data centers and universities	Heat Transition	Regulatory Instruments	Science, Research & Education	Medium	Implemented	KMR	Renewable Energy Expansion	307

Appendix A :Table of Current and Potential Measures in Baden-Württemberg

Cluster	Measure	Sector	Instrument Type	Target Level	Effectiveness	Implementation Status BW	Reference(s)	Impact Pathway	KMR ID
	Supporting the increase of controllable power plant capacities	Electricity Transition	Other/All	Companies & Economic Actors	High	Partly Implemented	Schmidt et al., 2022	Energy Infrastructure Expansion/Optimisation	
	State Government Renewable Energy Task Force	Electricity Transition	Informational & Supporting Instruments	Companies & Economic Actors	High	expired/ended	KMR	Various	
	SyNEA funding project (synchronization of grid and renewable energy expansion)	Electricity Transition	Informational & Supporting Instruments, Economic Instruments	Companies & Economic Actors	Medium	Implemented	KMR	Energy Infrastructure Expansion/Optimisation	425
	Dialogue forum "Energy transition and nature conservation"	Electricity Transition	Informational & Supporting Instruments	Various/All	Low	Implemented	KMR	Energy Infrastructure Expansion/Optimisation, Renewable Energy Expansion	194
	Energy Dialogue Forum (FED)	Electricity Transition	Informational & Supporting Instruments	Various/All	Low	Implemented	KMR	Various	196
	Information on renewable energies for implementing the energy transition	Electricity Transition	Informational & Supporting Instruments	Various/All	Medium	Implemented	KMR	Renewable Energy Expansion	183
	Initiation of a competition for cities and municipalities on PV expansion	Electricity Transition	Education & Campaigns	Municipalities / Regional Authorities	High	Not Implemented	Schmidt et al., 2022	Renewable Energy Expansion	
	Promoting the intelligent use of biological resources in a sustainable, circular bioeconomy	Cross-cutting	Informational & Supporting Instruments, Cooperation & Coordination Instruments	Companies & Economic Actors, Municipalities / Regional Authorities, Science, Research & Education	Low	Implemented	KMR	Renewable Energy Expansion	150
	Measures in cooperation with private economy	Cross-cutting	Cooperation & Coordination Instruments, Economic Instruments	Companies & Economic Actors, State Institutions	Medium	Partly Implemented	Schmidt et al., 2022	Reduced Energy/Heat Demand, Renewable Energy Expansion	
	Optimize the use of existing power grid capacities	Electricity Transition	Other/All	Companies & Economic Actors	Medium	Partly Implemented	Koch et al, 2025	Energy Infrastructure Expansion/Optimisation	
	Increasing the capacity of the electricity grid	Electricity Transition	Other/All	Companies & Economic Actors	Medium	Partly Implemented	Koch et al, 2025	Energy Infrastructure Expansion/Optimisation	
	Package of measures for climate-friendly district heating	Heat Transition	Other/All	Various/All	High	Partly Implemented	Schmidt et al., 2022	Renewable Energy Expansion	
	Low-interest loans for the installation of renewable energy systems	Electricity Transition	Economic Instruments	Companies & Economic Actors	Medium	Implemented	(L-Bank BW 2025	Renewable Energy Expansion	

Appendix A :Table of Current and Potential Measures in Baden-Württemberg

Cluster	Measure	Sector	Instrument Type	Target Level	Effectiveness	Implementation Status BW	Reference(s)	Impact Pathway	KMR ID
	Establishment of a renewable energy platform in Baden-Württemberg	Electricity Transition	Informational & Supporting Instruments, Cooperation & Coordination Instruments	Various/All	Medium	Implemented	KMR	Renewable Energy Expansion	429
	Subsidies for PV at parking lots	Electricity Transition	Economic Instruments	Various/All	Medium	Implemented	KMR	Renewable Energy Expansion	186
	Planning of PV systems at suitable federal and state tunnels in Baden-Württemberg	Electricity Transition	Planning & Strategic Instruments	Municipalities / Regional Authorities, Companies & Economic Actors, State Institutions	Medium	Partly Implemented	KMR	Renewable Energy Expansion	403
	PV systems on properties used for recycling management, especially on land formerly used for forestry	Electricity Transition	Regulatory Instruments	Municipalities / Regional Authorities	Medium	Partly Implemented	KMR	Renewable Energy Expansion	139
	PV on mobility infrastructure	Electricity Transition	Economic Instruments	Municipalities / Regional Authorities, Companies & Economic Actors	Medium	Implemented	KMR	Renewable Energy Expansion	424
	Agri-PV-Projects - Research & Pilots	Electricity Transition	Economic Instruments	Companies & Economic Actors	Medium	Implemented	KMR	New Technologies, Renewable Energy Expansion	185
	Obligation to install photovoltaic systems on roofs and parking lots (KlimaG BW)	Electricity Transition	Regulatory Instruments	Municipalities / Regional Authorities, Private Households, State Institutions, Companies & Economic Actors	Medium	Implemented	KMR	Renewable Energy Expansion	142
	Acceleration of build up of heating grids	Heat Transition	Other	Private Households, Municipalities / Regional Authorities, Companies & Economic Actors	High	Partly Implemented	Schmidt et al. 2023	Energy Infrastructure Expansion/Optimisation	
	Information and advice on heat pump technology by “Zukunft Altbau” (KEA-BW	Heat Transition	Informational & Supporting Instruments	Private Households, Municipalities / Regional Authorities	Medium	Implemented	KMR	Fuel switch	301
	Pilot program “Unskilled workers for the installation of heat pumps”	Heat Transition	Informational & Supporting Instruments	Companies & Economic Actors	High	Not Implemented	Schmidt et al. 2023	Fuel switch	

Appendix A :Table of Current and Potential Measures in Baden-Württemberg

Cluster	Measure	Sector	Instrument Type	Target Level	Effectiveness	Implementation Status BW	Reference(s)	Impact Pathway	KMR ID
	Financing platform H2BW	Electricity Transition	Informational & Supporting Instruments, Cooperation & Coordination Instruments	Various/All	Medium	Implemented	KMR	New Technologies	427
	HyFaB flagship project – Research factory for fuel cells and hydrogen	Electricity Transition	Other, Economic Instruments	Science, Research & Education, Companies & Economic Actors	Medium	Implemented	KMR	New Technologies	361
	Expert dialogue on hydrogen infrastructure	Electricity Transition	Cooperation & Coordination Instruments	Various/All	Medium	Implemented	KMR	Energy Infrastructure Expansion/Optimisation	428
	Support program for electrolyzers - ELY	Electricity Transition	Economic Instruments	Municipalities / Regional Authorities, Companies & Economic Actors, Science, Research & Education	Medium	Implemented	KMR	Energy Infrastructure Expansion/Optimisation	426
	Hydrogen Future Program (ZPH2)	Electricity Transition	Informational & Supporting Instruments, Economic Instruments	Science, Research & Education, Companies & Economic Actors	Medium	Implemented	KMR	New Technologies, Fuel Switch	285
	Package of measures: Implementation of the BW Hydrogen Roadmap	Electricity Transition	Other/All	Various/All	Medium	Partly Implemented	KMR	Energy Infrastructure Expansion/Optimisation, New Technologies, Fuel Switch	283
	Support for the development of a hydrogen network	Electricity Transition	Consulting & Participation, Planning & Strategic Instruments, Informational & Supporting Instruments	Bundesrat / Nation, Companies & Economic Actors, Municipalities / Regional Authorities, Civil Society	Medium	Implemented	KMR	Fuel switch, Various	286
	Deep geothermal energy: Increasing acceptance through state support for the establishment of an ombudsman association as the sponsor of an ombudsman for deep geothermal energy	Heat Transition	Informational & Supporting Instruments, Economic Instruments	Private Households, Companies & Economic Actors	Medium	Partly Implemented	KMR	Renewable Energy Expansion	395
	Monitoring of energy prices	Electricity Transition	Planning & Strategic Instruments	Various/All	Medium	Implemented	KMR	Fuel switch	272

Appendix A :Table of Current and Potential Measures in Baden-Württemberg

Cluster	Measure	Sector	Instrument Type	Target Level	Effectiveness	Implementation Status BW	Reference(s)	Impact Pathway	KMR ID
	"EKUS hoch i" real-world laboratory (energy saving and climate protection with intelligent individual room solutions in buildings) at the University of Stuttgart	Cross-cutting	Other/All	Science, Research & Education	Low	Implemented	KMR	Reduced Energy/Heat Demand	85
	Pilot projects at HdM Stuttgart and the University of Konstanz—use of new space, teaching, and work concepts for multifunctional, efficient use of space	Heat Transition	Other/All	Science, Research & Education Municipalities / Regional Authorities, Companies & Economic Actors, State Institutions, Science, Research & Education	Low	Partly Implemented	KMR	Reduced Energy/Heat Demand	95
	State strategy for resource efficiency	Cross-cutting	Planning & Strategic Instruments		Medium	Implemented	KMR	Reduced Energy/Heat Demand	147
	Socially Targeted State Funding for Building Decarbonisation	Heat Transition	Economic Instruments	Private Households Private Households, Companies & Economic Actors	Medium	Partly Implemented	Schmidt et al., 2022	Reduced Energy/Heat Demand, Fuel Switch	
	Targeted funding of renovation measures	Heat Transition	Economic Instruments	Economic Actors Municipalities / Regional Authorities, Companies & Economic Actors, Civil Society	Medium	Not Implemented	Schmidt et al., 2023	Reduced Energy/Heat Demand	
	Funding program "Klimaschutz-Plus"	Cross-cutting	Informational & Supporting Instruments, Economic Instruments		Medium	Implemented	KMR	Reduced Energy/Heat Demand, Fuel Switch	201
	Energy and climate protection concept for every university	Cross-cutting	Regulierung Information und Beratung	Hochschulen		Implemented	KMR	Reduced Energy/Heat Demand, Fuel Switch, Renewable Energy Expansion	337
	Strategic Overhaul for a Climate-Neutral State Administration	Cross-cutting	Planning & Strategic Instruments	State institutions	Medium	Not Implemented	Schmidt et al., 2022	Reduced Energy/Heat Demand, Fuel Switch, Renewable Energy Expansion	

Appendix A :Table of Current and Potential Measures in Baden-Württemberg

Cluster	Measure	Sector	Instrument Type	Target Level	Effectiveness	Implementation Status BW	Reference(s)	Impact Pathway	KMR ID
	Development of climate protection concepts by state cultural institutions; MWK climate protection concept working aid	Cross-cutting	Planning & Strategic Instruments	State institutions	Medium	Implemented	KMR	Reduced Energy/Heat Demand, Fuel Switch, Renewable Energy Expansion	318
	Climate protection requirements from the Higher Education Funding Agreement II (HoFV II)	Cross-cutting	Regulatory Instruments, Economic Instruments	Science, Research & Education	Medium	Implemented	KMR	Reduced Energy/Heat Demand, Fuel Switch, Renewable Energy Expansion	78
	Innovative renovation approaches for state-owned properties	Heat Transition	Other/All	State institutions	Medium	Partly Implemented / unclear	Schmidt et al., 2022	Reduced Energy/Heat Demand	
	Ensure compliance with energy regulations in new construction and renovation projects.	Heat Transition	Other/All	Various/All	Medium	Not Implemented	Schmidt et al, 2023	Reduced Energy/Heat Demand	
	Combined loan "Living with a climate bonus"	Heat Transition	Economic Instruments	Private Households	Medium	Implemented	KMR	Reduced Energy/Heat Demand	203
	Use of subsidy and contracting programs from Vermögen und Bau (Assets and Construction) to convert to modern building technology	Heat Transition	Economic Instruments	Science, Research & Education	Medium	Implemented	KMR	Reduced Energy/Heat Demand	304
	Differentiated state funding for renovation measures	Heat Transition	Economic Instruments	Various/All	High	Not Implemented	Kelm et al, 2023	Reduced Energy/Heat Demand	
	Ensuring sustainable building standards	Heat Transition	Informational & Supporting Instruments	Bundesrat / Nation	Medium	Planned	KMR	Reduced Energy/Heat Demand	170
	Strengthening enforcement of legal requirements in the area of building energy efficiency	Heat Transition	Informational & Supporting Instruments	Municipalities / Regional Authorities	Medium	Implemented	KMR	Reduced Energy/Heat Demand	204
	Strengthening the energy advisory structure for citizens	Heat Transition	Informational & Supporting Instruments	Private Households	Medium	Partly Implemented	KMR	Reduced Energy/Heat Demand	220
	Use of scientific findings (e.g., from the Strategy Dialogue on Construction/Planning) for pilot construction projects at universities	Heat Transition	Informational & Supporting Instruments	Science, Research & Education	Low	Partly Implemented	KMR	Reduced Energy/Heat Demand, Fuel Switch	305

Appendix A :Table of Current and Potential Measures in Baden-Württemberg

Cluster	Measure	Sector	Instrument Type	Target Level	Effectiveness	Implementation Status BW	Reference(s)	Impact Pathway	KMR ID
	Including measures of living space sufficiency and house conversion in advising	Heat Transition	Informational & Supporting Instruments	Private Households	Medium	Partly Implemented	Schmidt et al, 2023	Reduced Energy/Heat Demand	
	Baden-Württemberg renovation roadmap	Heat Transition	Informational & Supporting Instruments	Companies & Economic Actors, Private Households	Medium	Implemented	Umweltministerium BW, n.d.	Reduced Energy/Heat Demand	
	Energy Efficiency and Renewable Energies Funding Program (EffeE)	Electricity Transition	Informational & Supporting Instruments, Economic Instruments	Companies & Economic Actors	Medium	Implemented	KMR	Reduced Energy/Heat Demand	423
				Private Households, Civil Society, Municipalities / Regional Authorities, Companies & Economic Actors					
	Housing initiative BW	Heat Transition	Informational & Supporting Instruments, Economic Instruments, Cooperation & Coordination Instruments	Various/All	Medium	Implemented	KMR	Reduced Energy/Heat Demand	37
	Promotion of serial renovation	Heat Transition	Cooperation & Coordination Instruments, Informational & Supporting Instruments, Economic Instruments	Various/All	Medium	Not Implemented	Kelm et al, 2023	Reduced Energy/Heat Demand	
	Examination of the possibility of achieving CO2 savings through efficient accommodation, space utilization, and workplace concepts.	Heat Transition	Other/All	State institutions	Low	Implemented	KMR	Reduced Energy/Heat Demand	113
	Creation of master plans for the structural development planning of universities	Cross-cutting	Informational & Supporting Instruments	Municipalities / Regional Authorities	Medium	Implemented	KMR	Various	302
	Communication for sufficiency and efficiency	Cross-cutting	Education & Campaigns	Private Households	Medium	Partly Implemented	Schmidt et al., 2022	Reduced Energy/Heat Demand	
	Measures to influence the behaviour of state employees	Cross-cutting	Education & Campaigns	State institutions	Low	Partly Implemented	Schmidt et al., 2022	Reduced Energy/Heat Demand	
	Communication and dialogue on energy saving, energy efficiency, and sustainable consumption in society and in private households	Cross-cutting	Education & Campaigns	Private Households	Medium	Partly Implemented	Schmidt et al., 2022	Reduced Energy/Heat Demand	

Appendix A :Table of Current and Potential Measures in Baden-Württemberg

Cluster	Measure	Sector	Instrument Type	Target Level	Effectiveness	Implementation Status BW	Reference(s)	Impact Pathway	KMR ID
	BWGreenLabs ideas competition: Sustainable use of energy and resources in research laboratories in the state of Baden-Württemberg	Cross-cutting	Education & Campaigns, Economic Instruments	Science, Research & Education	Medium	Implemented	KMR	Reduced Energy/Heat Demand, New Technologies	435
	Expansion of the renovation sprint approach	Cross-cutting	Other/All	Other	High	Not Implemented	Schmidt et al, 2023	Reduced Energy/Heat Demand	
	Innovation competition on converting houses ("Schaffe schaffe, Häuser umbauen")	Heat Transition	Education & Campaigns	Private Households	Medium	Not Implemented	Schmidt et al, 2023	Reduced Energy/Heat Demand	
	Improvement of monitoring: updating of the monitoring concept for the building stock in Baden-Württemberg	Heat Transition	Planning & Strategic Instruments	Various/All	Low	Partly Implemented	KMR	Reduced Energy/Heat Demand	210
	Digitization of building operations through smart building technologies	Heat Transition	Regulatory Instruments	Science, Research & Education	Low	Partly Implemented	KMR	Reduced Energy/Heat Demand	96
	Change of the state building regulations (LBO) to facilitate conversion of existing buildings	Heat Transition	Regulatory Instruments	Private Households	Medium	Implemented	Schmidt et al, 2023	Reduced Energy/Heat Demand	
	Package of measures for universities	Cross-cutting	Regulatory Instruments, Informational & Supporting Instruments	Science, Research & Education	Medium	Implemented	KMR	Reduced Energy/Heat Demand	80
	Implementation of efficient space management at universities	Heat Transition	Regulatory Instruments, Informational & Supporting Instruments	Science, Research & Education	Medium	Partly Implemented	KMR	Reduced Energy/Heat Demand	306
	requiring gas transmission system operators to supply only greenhouse gas-neutral gases across the state border from 2040 onwards.	Cross-cutting	Regulatory Instruments	Companies & Economic Actors	High	Not Implemented	Schmidt et al, 2023	Fuel switch	
	regulation: decarbonization of heating grids by 2040.	Heat Transition	Regulatory Instruments	Municipalities / Regional Authorities, Companies & Economic Actors	Medium	Not Implemented	Schmidt et al, 2023	Fuel switch	

Appendix A :Table of Current and Potential Measures in Baden-Württemberg

Cluster	Measure	Sector	Instrument Type	Target Level	Effectiveness	Implementation Status BW	Reference(s)	Impact Pathway	KMR ID
	obligatory check of old heating systems	Heat Transition	Regulatory Instruments	Private Households	Medium	Implemented by national Level (§60b GEG)	Schmidt et al., 2022	Fuel switch	
	"WärmenetzBW" - provision of standard concepts for renewable heating	Heat Transition	Planning & Strategic Instruments	Municipalities / Regional Authorities, Private Pouseholds, State Institutions, Companies & Economic Actors	Medium		Schmidt et al. 2023	Energy Infrastructure Expansion/Optimisation, Fuel Switch	
	Support of Smart meter heat pump pricing BW	Heat Transition	Economic Instruments	Private Households	Medium		Kelm et al., 2023	Energy Infrastructure Expansion/Optimisation	
	Klimawin	Cross-cutting	Informational & Supporting Instruments, Cooperation & Coordination Instruments	Companies & Economic Actors	Medium		Nachhaltigkeitsstrategie BW, n.d.b	Various	
	Klimabündnis	Cross-cutting	Cooperation & Coordination Instruments	Companies & Economic Actors	Medium	Implemented	Nachhaltigkeitsstrategie BW, n.d.a	Various	
	Regulations on hydrogen and heat grid expansion areas	Heat Transition	Regulatory Instruments	Companies & Economic Actors, Private Households	Medium	Not Implemented	Schmidt et al. 2023	Energy Infrastructure Expansion/Optimisation	
	Revision of the State Development Plan / Strengthening climate protection in spatial planning	Cross-cutting	Regulatory Instruments	Various/All	Medium	Planned	KMR	Various	25

Appendix B: Statistics of Identified Current and Potential Measures in Baden-Württemberg

All Measures Identified							
Instrument Type	Count	Target Level	Count	Implementation Status	Count	Impact Pathway	Count
Regulatory Instruments	44	Private Households	27	Implemented	90	Reduced Energy/Heat Demand	50
Economic Instruments	50	Civil Society	10	Partly Implemented	50	Renewable Energy Expansion	46
						Energy Infrastructure	
Informational & Supporting Instruments	48	Companies & Economic Actors	58	Planned	5	Expansion/Optimisation	23
Planning & Strategic Instruments	29	Bundesrat / Nation	4	Not Implemented	39	Hydrogen & New Energy Carriers	0
Cooperation & Coordination Instruments	18	State institutions	27	Decided on	2	Fuel switch	38
Direct Implementation	2	Science, Research & Education	24	expired/ended	3	New Technologies	11
Education & Campaigns	12	Municipalities / Regional Authorities	47			Various	51
Consulting & Participation	3	Other	1				
Other / All	0	Various/All	53				

Measures in the KMR (73)							
Instrument Type	Count	Target Level	Count	Implementation Status		Impact Pathway	Count
Regulatory Instruments	14	Private Households	10	Implemented	92	Reduced Energy/Heat Demand	31
Economic Instruments	31	Civil Society	8	Partly Implemented	18	Renewable Energy Expansion	24
						Energy Infrastructure	
Informational & Supporting Instruments	34	Companies & Economic Actors	30	Planned	4	Expansion/Optimisation	12
Planning & Strategic Instruments	17	Bundesrat / Nation	3	Not Implemented	1	Hydrogen & New Energy Carriers	0
Cooperation & Coordination Instruments	10	State institutions	14	Decided on	2	Fuel switch	17
Direct Implementation	1	Science, Research & Education	22	expired/ended	1	New Technologies	11
Education & Campaigns	2	Municipalities / Regional Authorities	29			Various	29
Consulting & Participation	1	Other	0				
Other / All	0	Various/All	26				

Fully Implemented Measures (90)							
Instrument Type	Count	Target Level	Count			Impact Pathway	Count
Regulatory Instruments	13	Private Households	10			Reduced Energy/Heat Demand	25
Economic Instruments	28	Civil Society	8			Renewable Energy Expansion	22
						Energy Infrastructure	
Informational & Supporting Instruments	29	Companies & Economic Actors	29			Expansion/Optimisation	10
Planning & Strategic Instruments	13	Bundesrat / Nation	1			Hydrogen & New Energy Carriers	0
Cooperation & Coordination Instruments	10	State institutions	15			Fuel switch	16
Direct Implementation	2	Science, Research & Education	16			New Technologies	9
Education & Campaigns	2	Municipalities / Regional Authorities	26			Various	27
Consulting & Participation	3	Other	0				
Other / All	0	Various/All	20				

Partly Implemented Measures (50)							
Instrument Type	Count	Target Level	Count			Impact Pathway	Count
Regulatory Instruments	12	Private Households	8			Reduced Energy/Heat Demand	15
Economic Instruments	13	Civil Society	1			Renewable Energy Expansion	16
						Energy Infrastructure	
Informational & Supporting Instruments	10	Companies & Economic Actors	13			Expansion/Optimisation	6
Planning & Strategic Instruments	5	Bundesrat / Nation	1			Hydrogen & New Energy Carriers	0
Cooperation & Coordination Instruments	4	State institutions	5			Fuel switch	7
Direct Implementation	0	Science, Research & Education	5			New Technologies	1
Education & Campaigns	7	Municipalities / Regional Authorities	8			Various	10
Consulting & Participation	0	Other	0				
Other / All	0	Various/All	16				

Not Implemented Measures (39)							
Instrument Type	Count	Target Level	Count			Impact Pathway	Count
Regulatory Instruments	13	Private Households	7			Reduced Energy/Heat Demand	7
Economic Instruments	6	Civil Society	1			Renewable Energy Expansion	6
						Energy Infrastructure	
Informational & Supporting Instruments	4	Companies & Economic Actors	10			Expansion/Optimisation	5
Planning & Strategic Instruments	6	Bundesrat / Nation	1			Hydrogen & New Energy Carriers	0
Cooperation & Coordination Instruments	3	State institutions	2			Fuel switch	13
Direct Implementation	0	Science, Research & Education	0			New Technologies	0
Education & Campaigns	3	Municipalities / Regional Authorities	10			Various	5
Consulting & Participation	0	Other	1				
Other / All	0	Various/All	13				