



Energy Improvement Districts – A Model Instrument for Low-Emission Cities

AREA 21 Project Partners



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Foreword

The main objective of the AREA 21 project is energy efficiency in the Baltic Sea Region. AREA 21 is a transnational cooperation co-funded through the Interreg Baltic Sea Region Programme 2014–2020. The project strives to bring together public authorities, energy providers, property owners and citizens in seven different cities in the Baltic Sea Region to foster energy efficiency initiatives at the district level. In this way, AREA 21 aims to decrease CO₂ emissions in urban areas and help cities and regions meet their own and international goals to fight climate change.

▲ Prof. Jörg Knieling
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on behalf of the AREA 21
consortium.

We are delighted to share with you the results of the AREA 21 project. This publication summarizes the project's strategies and concepts and shares the successful results of its implementation. It is a collection of the key lessons learnt from intensive and extensive collaboration and transnational learning. Furthermore, it includes the introduction of the Energy Improvement District concept, a guideline on how to initiate it and the necessary processes involved in its implementation and execution of actions.

The stimulating Interreg framework has enabled the AREA 21 consortium to set up this engaged and successful collaboration. All AREA 21 partners aspire to these results finding their way into local practice in the Baltic Sea Region as well as throughout Europe. The Energy Improvement District provides a suitable toolkit to foster local energy efficiency and thus contribute to the European Union's climate mitigation goals. It offers a framework that helps identify investment opportunities in future technologies which would contribute to the ambitious European Green Deal. We invite you to join us on this path of green innovation towards a carbon neutral European future!

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Executive Summary

This publication summarizes the main outcomes and experiences of implementing the AREA21 project. The goal of the project was to introduce an uncomplicated instrument for reducing CO₂ emissions in existing urban areas: The Energy Improvement District (EID) concept. The EID is an innovative system approach for low emission urban districts. It promotes a paradigm shift from a strong public sector to a more cooperative model of development that also involves citizens and businesses. The concept facilitates the pooling of competences, ideas and joint activities between public and private stakeholders for energy efficiency planning and implementation. By promoting network and consensus-building activities, it fosters the identification of tailor-made solutions, the piloting of new projects and the establishment of both informal cooperation and formalized partnerships. The EID concept offers transferrable modules, guidelines and frameworks that can be applied in any situation. The authors will present the EID concept with its main features, benefits and success stories of its implementation, as well as the challenges and coping strategies involved in the process. They will show that EIDs can be a relevant instrument to successfully reach climate goals and boost local cooperation with several spillover effects for the different stakeholders and sectors. The authors will also introduce transferrable phases for the planning, implementation and execution of the EID concept. These should guide the interested reader, giving an initial impression of the necessary processes and steps.

This goal of this publication is merely to introduce the EID concept and the key results of the project in a summarized format. Additional and more detailed information can be accessed in the main publication of the project: “Energy Improvement Districts – Conceptual and Technical Guidance for Implementing Cooperative Energy Planning at the District Level”.



Introduction

AREA 21 aims to provide local authorities, energy agencies and other institutions responsible for energy planning with the know-how and strategic tools for planning and implementing new solutions for energy efficiency in urban districts. To achieve this, the project has developed and tested new formats of cooperation between public authorities, energy providers, public property owners and citizens. Together, across seven locations in the Baltic Sea Region, this project will facilitate public organizations and private actors to work together in elaborating holistic strategies and implementing context-specific measures in Energy Improvement Districts (EIDs). The AREA 21 project is a transnational cooperation partly funded through the Interreg Baltic Sea Region Programme, carried out from 2017–2020.

Description and Aim

Cities, with their vast building stock and infrastructure, play a key role in contributing to European energy efficiency targets. With approximately 75% of the EU population living in cities and urban areas, these account for a large proportion of current energy consumption and represent crucial spaces where energy transition should take place. Transforming the existing urban structures offers great potential for energy efficiency. However, the transition towards low-emission cities is often hampered by sectoral fragmentation and a lack of cooperation between public authorities, energy utilities and property owners. AREA 21 addresses these challenges and supports cities in the Baltic Sea Region to harness the full energy savings potential of existing structures, to elaborate holistic strategies that integrate sector-based approaches and to engage energy consumers in strategic energy planning.

This publication briefly presents the main outputs of the AREA 21 project: the collaborative and integrated systemic approach of urban energy planning at the district level – the EID. In addition, it provides an overview of the planning, implementation and execution phases of the EID. In this way, the publication summarizes the project's proposals and the successful results of its implementation. It is a collection of the key lessons learnt through intensive, extensive and transnational collaboration. The goal of this publication is to introduce the EID concept and its main results in a summarized format. For further and more detailed information on the topics presented in this publication, as well as the publicly-implemented results of the project, please refer to the “Energy Improvement Districts – Conceptual and Technical Guidance for Implementing Cooperative Energy Planning at the District Level” (AREA 21, 2020). These include the following main outputs: “Guidance on Cooperative Energy Planning at the District Level”, “Energy Improvement District (EID) Concept”, and “Process Model for Cooperation in Energy Improvement Districts”.

The first chapter presents the developed and tested Energy Improvement District concept, including an introduction to the concept, its benefits and success stories, as well as its challenges. This will enable the reader to become familiar with the concept, its approach and its potential and limitations. The benefits and challenges experienced during the project are presented in order to describe both the potential of the EID as an instrument as well as the challenges involved, so that these can be timeously identified and addressed.

The second chapter will briefly introduce the phases of planning, implementing and executing the EID. These phases are derived from the AREA 21 project experiences and, due to their modular nature, can be transferred to other context-specific cases.

▼ *Helsingborg EID, Sweden;
Energy efficient hospital
area – thinking economy,
environment and society
together.*





The Energy Improvement District Concept

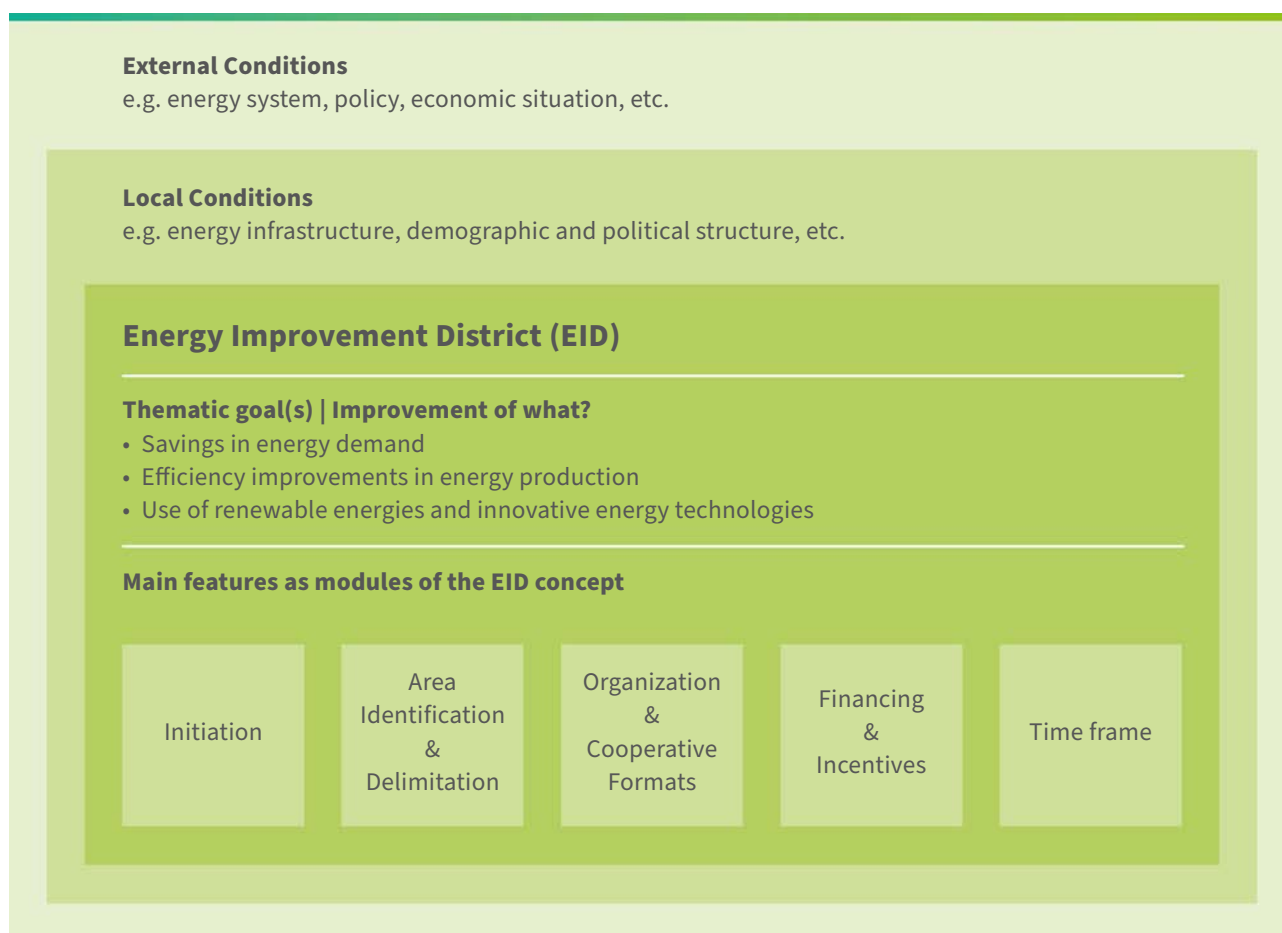
This chapter includes the core results of the AREA 21 project: the instrument to help cities and regions unlock further potential in energy efficiency planning at the district level – the Energy Improvement District (EID) concept.

The Energy Improvement District Approach

The EID approach is a forward-thinking instrument to drive energy efficiency and innovation at the district level. EIDs are innovative energy efficient model areas which bring together public and private stakeholders from multiple backgrounds (e.g. energy companies, property owners, local authorities, etc.) to jointly plan and implement tailored energy solutions. The collaboration of diverse stakeholders builds a strong partnership between public and private actors from different sectors that continues throughout the lifetime of the EID to ensure integrated decision-making.

What is the EID Approach?

The main features and characteristics of an EID depend on the district's framework conditions and the energy objectives in response to these conditions. For example, a district's existing framework conditions could be strongly characterized by political structures, the level of leadership of stakeholders, the urban layout or the current energy system. These conditions could then determine the selected spatial area or focus of energy efficiency measures, such as increasing the use of renewable energies or generating savings in energy demand. It is necessary to clarify the interdependency and influence of measures, e.g. financing issues could depend on the way the EID is initiated and organized. Therefore, since the district's framework conditions determine the project's nature, the process can be depicted as a modular approach in which features are adjusted according to the prevailing conditions. Figure 1 represents the main features of the EID concept as a modular approach in relation to the thematic goal of the project and the district's framework conditions.




▲ **Figure 1:** Main features of the Energy Improvement District.

The modular approach considers five different features as modules: (1) initiation, (2) area identification and delimitation, (3) organization and cooperative formats, (4) financing and incentives and (5) time frame.

The **initiation** of the EID does not refer directly to the reason for its establishment, but mostly to the leading stakeholders pushing the process. Therefore, the question that should be asked when defining the initiation module is: *Who is the (main) initiator of the EID process?* The answer to this question will define whether the EID has a top-down (e.g. initiated by the local authorities) or a bottom-up (e.g. initiated by building owners) approach. Either way, the EID should develop into a combined and interactive bottom-up/top-down approach. This means that public authorities validate the needs of other stakeholders and provide formal structures and resources, while private actors and civil society communicate their needs and ideas, evaluate the measures and participate in and support the decision-making process.

The **area identification and definition of boundaries** is identified by the actors involved. To support this decision, the following question should guide the definition of the EID area: *Which criteria define the scope of an EID?* These criteria will result in different boundary types and area sizes. For example, the boundaries can be aligned with the boundaries of:

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- Existing administrative areas.
 - Informal cooperation structures.
 - Specific infrastructures (e.g. a university area).
 - Functional areas (e.g. an area that uses the same district heating network).
 - Areas with potential for improvements in terms of energy efficiency.
 - Model districts within city, regional or national strategic plans.

The size of the EID area is also important since it must be compatible with the EID objectives. For example, a smaller area can be advantageous in terms of the successful implementation of efficiency and energy supply measures or cooperation between stakeholders. In the case of the refurbishment of buildings, a smaller EID area is also suitable. In contrast, a case of district heating and cooling systems requires the selection of a larger area, since this improves the technical feasibility. Furthermore, the size of the area is also central to the delimitation of costs. It is important to identify whether economies of scale within a larger area, with more “units” to be upgraded, incur a cost reduction for the individual participating stakeholders.

The **cooperative formats** refer to which stakeholders are involved and what their dynamics are. The identification of possible cooperation formats within the EID is guided by the questions: *Who are the involved stakeholders and how are their practices institutionalized?* There are several examples of different cooperation formats, such as public-private partnerships, renovation cooperatives, research cooperation projects, etc. The **organizational structure** refers to the management of the EID. The questions that support the definition of the organizational structure within the EID are *who is responsible for which activities and what are the rules for the steering of the EID?* As in the case of the cooperation formats, the organizational structure also varies from case to case. For example, in some projects, an energy district manager (i.e. an EID coordinator) is employed for an EID-like process, often as a part of the local administration.

The **financing and incentives** for the establishment of an EID refer to the means of dealing with the costs associated with planning and implementing the measures for increasing energy efficiency. These costs depend on the type of measure, and the guiding questions to support the identification of potential financing methods are *what are the costs associated with achieving the desired measures and how can the necessary resources be acquired?* Some examples of funding sources include the pooling of private capital within the district, (EU, national or regional) subsidies and grants, credit programmes, renewable



energy contracts, etc. The concept supports a combination of different methods aimed at distributing the financial burden among all participating stakeholders. Also, the development of feasibility studies supports the stakeholders in having a concrete plan for their expenses and knowledge of their future savings (e.g. lower energy demand from end-users) and higher profits (e.g. higher profitability due to more efficient systems and less energy loss in distribution).

▲ *Kalda EID Tartu, Estonia.*

The final module within the EID concept refers to the **time frame** for the definition, planning and implementation of the EID. The following questions support the definition of a suitable time frame for the duration of the EID: *What phases are necessary for the completion of the EID's purpose and what are their durations? Are there time constraints associated with the EID? What is the overall resulting duration of the project – from deciding to establish the EID to its completion?* An understanding of the complete process necessary to establish an EID is crucial in defining its duration. However, knowing how much time is necessary to complete a project may be inconsistent with constraints from other variables – especially funding. The timing of the EID is dependent upon its staging of conditions and overall objectives. For example, when the measures of the EID are primarily financed by a funding programme, it is important to consider the scheduling of implementation and the total duration in years of the project. In the AREA 21 project, the experience is that a longer project time frame is recommended. Preparation time and implementation of measures, in particular, are more time-consuming than expected. Experience has shown that the implementation phase, as well as all the other processes, could be supported and facilitated by the employment of an EID coordinator.

What are the Main Pillars?

Three fundamental concepts support the EID approach: (1) a holistic system perspective, (2) an integrated approach to strategic energy planning and implementation and (3) cooperative planning, decision making and implementation. These are the main pillars of the EID concept.

A holistic system perspective refers to the shift from single building solutions to a holistic system approach for the entire district. Various actors, buildings, facilities and infrastructure units are grouped together to improve energy efficiency in the whole area and to benefit from technical, financial and societal advantages. These benefits are achievable on two fronts. The first refers to the economies of scale, since the refurbishment of multiple units, for example, could mean a lower per unit cost of refurbishment. The second front refers to synergies. It is easier to perceive the result gains for sectors beyond energy when aggregating multiple measures when looking at the system as a whole. For example, upgrading the heating infrastructure combined with the renovation of residential units provides more than an energy efficient system; if applied correctly and effectively, it also reduces costs for end-users and suppliers (lower demand and less energy losses in the network) and improves the living conditions of tenants in the residential units. This point is important in terms of the legitimacy of the process and the support and acceptance of the implemented measures by citizens.

An integrated approach to strategic energy planning and implementation refers to the planning and implementation of measures for energy saving, energy efficiency and the use of renewable energies across multiple sectors and governance levels. This implies the coordination of multiple sectors, governance levels and stakeholders. Although complex, this interdisciplinary EID thinking has two fundamental benefits. The first is increased commitment, since various actors act as co-creators, not only in the definition phase of the strategic goals, but also in the practical implementation of the measures. Ownership also reduces resistance to actions. The second is the avoidance of cross-sectoral fragmentation and trade-offs, since the EID concept is based on an interdepartmental and cross-sectoral approach that moves away from a single sector perspective. In addition, the coordination of national and regional targets with local community planning should be ensured. The guidelines and objectives of the overall urban planning concepts must be aligned and specialized at the district (EID) level, especially regarding energy issues. This should be supplemented by the consideration of long-term urban development plans and their integration with energy planning.

Cooperative planning, decision-making and implementation of energy improvement measures means that many types of actors decide on, develop and implement energy projects. Cooperative actors could include, for example, public authorities, energy utilities, property owners, housing cooperatives and local citizens. Cooperation formats and citizen participation instruments that could be used within the EID include public-private partnerships, property owner meetings, roundtables, workshops, etc. These formats can vary depending on the EID phase of planning, decision-making and implementation. Local networks formed through these formats should develop into stable cooperation structures in the long term. The selection of appropriate tools for collaboration is also fundamental in facilitating the communication of stakeholders, aiming to develop highly beneficial and synergetic initiatives for the EID.

Benefits and Success Stories from the Energy Improvement Districts

Key Messages

- Experiences from the project, together with a literature review, demonstrate that stakeholder collaboration is beneficial for the actors involved and outweighs the challenges.
- Benefits relate to finances, funds, technical aspects, renovations, society and the public sector.
- Success stories from the implementation demonstrate that the EID is practice-proof and context-specific.

This section addresses the benefits and motivations for stakeholders implementing an EID. It helps interested actors identify the scope of gains that can be achieved. There are three thematic objectives of the concept with several action areas that offer benefits to energy planning at the district level (see Figure 1 and AREA 21, 2020, p.47). In addition to these benefits, cooperation is a central aspect offering potential. Good ideas are created together and in accordance with the needs of the stakeholders. This section illustrates the wide range of benefits achievable through the EID model and underlines them with success stories of the AREA 21 partners. From the project experiences and the literature review, the authors conclude that stakeholder collaboration is beneficial to participants and outweighs its challenges (see AREA 21, 2020).

Common unexploited benefits from stakeholder collaboration can be unlocked in four areas: finances and funding, technical aspects and renovation, society and the public sector. Since several aspects are interlinked, they cannot be assigned to a single area (e.g. the link between financial gains by using state-of-the-art technology). For practical reasons they are mentioned in one of the categories only.

Finances and Funding

In terms of finances and funding, more information is provided about raising the necessary funds. This requires, in particular, a close and transparent communication with funding providers. In addition, bundling the financial resources of several partners increases the budget for systemic and improved options, e.g. for renovations or energy production, and reduces the risks and financial burdens. Building owners and energy users (tenants and companies) can profit from scale effects relating to the central purchase of heating and electricity. Further, a reduction of operating costs may occur, e.g. if utility operators of central power plants undertake scheduled maintenance by

qualified operators. In addition, the individual operation and maintenance of boilers and chillers is no longer necessary (and costs for the maintenance of individual highly-efficient equipment would be much higher). This reduces costs from energy price spikes and establishes stable prices and long-term certainty in energy bills for customers. In addition, it provides lower operating costs and the improved planning of long-term budgets for the system operator. In general, a high standard of energy efficiency (low primary energy factor) reduces the costs of rents and energy poverty for tenants and house owners. The pooling of funds, especially with respect to co-financing (e.g. when applying for funds from a state programme), can reduce complexity and lower the formal barriers to applications. It can also reduce the costs of the applicants' measures (time, accessibility, benefits of scale regarding materials, etc.). Furthermore, some initiatives require large initial investments (community energy plants, etc.) so that the pooling of funds from different stakeholders might be a way of collecting initial capital ("critical mass"). However, the main concern here is the return on investments and the time frame for this return (short-term investments vs. long-term benefits). Some city funding programmes are explicitly designed to support community-led initiatives (and not single flat renovations). This often requires a consortium of applicants, thus supporting pooled applications as used in the EID partner cities with a collaborative energy planning approach. Energy planning reduces the expenses of municipalities and further stakeholders and increases their financial scope for (other) actions.

Technical Aspects and Renovations

In terms of renovations, cooperation helps build trust between stakeholders, using their expertise and strengths. It strengthens ownership and creates win-win situations that increase pro-active cooperation and reduce resistance to measures (e.g. for tenants). This also applies to the involvement of end-users that can contribute to data on energy and service demand. As a result, actions can lead to an increase in the quality of life (for tenants) as well as land value. In the systemic approach of the EID, where the district is viewed with its potential in the areas of energy infrastructure (net and grid), building renovations, energy supply etc., technical solutions can be applied that are more efficient and beneficial to all stakeholders (e.g. lower costs, maintenance, appliances, individual expertise needed, losses through ageing infrastructure, etc.). In general, optimization helps to keep prices low. End-users could save energy and costs by using new information and communication technology (ICT) tools. The generated data could be used by energy utilities or other service providers to improve services and efficiency. Benefits specific to associations, companies and public authorities are new and innovative ways of renovating the existing infrastructure, especially in terms of major measures or changes. This is an opportunity to combine several sectoral approaches, such as the potential for recycling residual waste to generate power and heat (e.g. by biogas), the replacement or renovation of infrastructure and buildings, and the introduction of photovoltaics, etc. Renewables technology (systems, infrastructure and appliances) increases reliability according to the energy requirements of the district, e.g. reducing peak energy loads that could affect energy supply and costs.

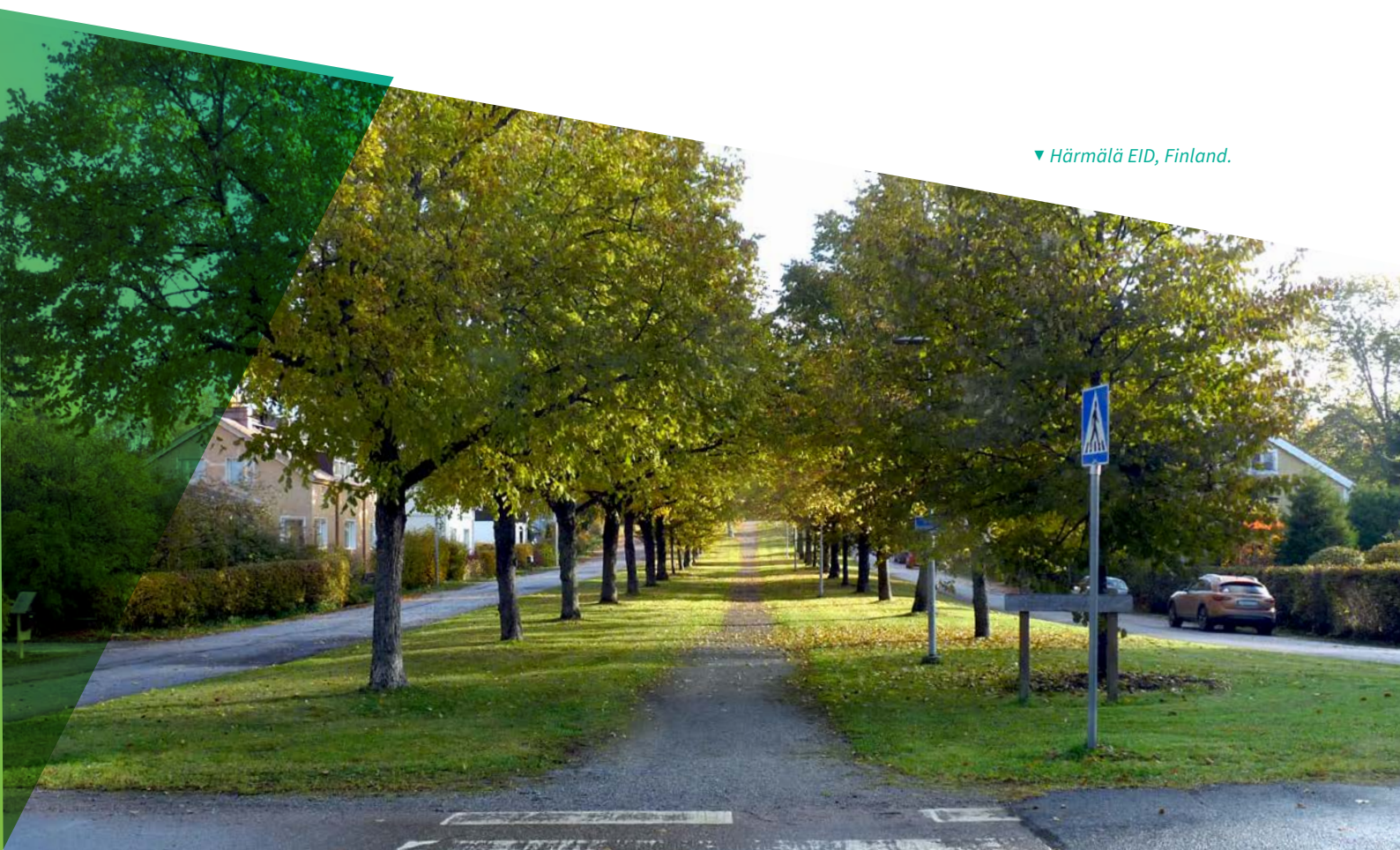
Societal Aspects

Municipalities and citizens, in particular, can benefit from the reappropriation of community spaces. New opportunities arise for cooperatives using renewable energy sources and supplying and redistributing energy where required. This breaks the traditional dependence on often oligopolistic energy utilities. In addition, apps could support the efficient use of energy and raise awareness. Further positive effects for society are the strengthening of community bonds, behaviour changes (pro energy efficiency and climate protection), an increased knowledge of energy planning and a reduction in energy use. Building on local knowledge and networks increases ownership and participants could develop solutions appropriate to local contexts. Solutions to local challenges could include addressing fuel poverty, local economic development, emergent experiments in self-governance and participatory democracy. In terms of local pollution, refurbishment or an exchange of utilities can result directly in an improved environment, thus supporting local living conditions. Strategic energy planning may also lead to a better environment (due to less pollution and improvement measures), thus increasing the well-being and living conditions of the neighbourhood. In addition, financial benefits, such as lower costs for housing, could support low-income tenants.

Public Sector Aspects

In addition to the above-mentioned benefits that also apply to the public sector, is the opportunity to regain community control of energy supply. Ownership of local infrastructure reduces cash drains and allows the municipality to reinvest in community-specific projects. In addition, local ownership enables decision-making and self-governance.

▼ Härmälä EID, Finland.





▲ Participants of the
“EcoGen Cup”,
EID St. Petersburg
Polytechnic, Russia.

Success Stories

In addition to the development process for the measures used in the AREA 21 case studies, the partners’ experiences also provided clear examples on how the various stakeholders could benefit from their participation in the EID development.

The **EID Helsingborg**, Sweden, consists primarily of a hospital area with one hospital building and six detached houses. The project brings together the public property owner (Region Skane), the building management (including staff) and the local energy supplier (Öresundskraft) in the development of the EID. Cross-

sectoral workshops (i.e. including stakeholders from the different sectors) fostered the identification of synergies between healthcare and effective energy and climate work. The energy savings resulting from the implementation of energy measures freed resources for investment in healthcare, benefiting the healthcare departments in the Helsingborg Hospital. Furthermore, the energy utility gained new opportunities for operating (services of flexible energy output and energy reuse) and knowledge relating to energy use within the EID. This will help to support them in optimizing local energy systems for increased efficiency, profit and meeting CO2 emission reduction targets. To highlight these efforts, the local project team created a movie of the energy-smart hospital: » <https://www.youtube.com/watch?v=Qymj9YLB1y8>.

The **EID Tampere Härmälä** in Finland consists of a mixed-use area. The EID development was based on workshops with building owners and local SMEs and received the support of local and energy authorities in addition to the energy utility and the non-profit energy agency Ecofellows Ltd. Their measures support the upgrading of heating systems in buildings, providing owners with tools, knowledge and funding information to facilitate the transition. Furthermore, the success of the project within the EID resulted in plans for replicating this EID model nationwide.

The **EID Kohtla-Järve** in Estonia consists of a mixed-use area with residential and public functions. The fundamental goal of this project is to increase energy efficiency and quality of life for users of historical buildings in the area. Their measures included an audit of the historical buildings in the area and measuring the potential for improvement in terms of energy savings. As a result, they produced guidelines to support building owners with renovations. These contained step-by-step instructions informed by expertise the building owners might not otherwise have had access to.

The **EID St. Petersburg Polytechnic** (SPbPU) in Russia includes the area of the university. The target is to reduce energy use by means of awareness raising. The university initiated an “EcoGen Cup” championship for SPbPU students (“edutainment”) as the end-users of communal infrastructure at the EID Polytechnic. A total of 37 students from different SPbPU institutes participated. They analysed the status quo of energy consumption on the SPbPU campus and proposed their own ideas and concrete measures aimed at energy saving. The main focus of the analysis was measures to involve end-users in energy saving, even though they have no direct economic motivation (SPbPU pays for the resources consumed, while the students and teachers who consume these resources do not pay for it). The high-level politician, Dmitry Peskov, Special Representative of the President of the Russian Federation on Digital and Technological Development and head of the division of the Agency for Strategic Initiatives, participated in the discussion of the presented ideas. He noted the importance and relevance of the issues discussed. Strategies suggested by the winning teams included an introduction of a rating system of incentives, a competition for the most energy efficient dormitory, social privileges, creating a mobile app with augmented reality content (with examples of 3D models), intellectual games in the “your own game” format, the placement of motivational posters, etc.

What Are the Challenges and How to Address Them?

Key Messages

- There are costs related to participation: it is time consuming, requires organization and financial and personnel resources, and it may differ from the original plan.
- The main challenges to stakeholder cooperation are (1) a diverse spectrum of stakeholders, (2) a lack of commitment and interest, (3) motivating citizens (to participate), (4) inexperience in cooperation culture, (5) communication problems and (6) long-term visions for companies and public authorities.

Although cooperation for energy planning can be highly beneficial, it is often not undertaken due to the various associated challenges. Additional costs for actors may arise, e.g. in the initiation, implementation and communication in the processes, especially in the context of actors of different levels of institutionalization and where questions of power and capability are central (i.e. homeowners vs. energy utility). The knowledge of these challenges and the development of context-appropriate mitigation strategies is fundamental to the successful implementation of the EID model. This section is informed by the observations of the project partners and their experiences in implementing energy planning in their EID.

Challenges of Cooperation

A common challenge is often the diverse spectrum of stakeholders. It is difficult to find the right focus and define goals that satisfy most stakeholders. The development of common strategic goals is crucial for the definition of an EID. Experiences from the implementation also show that there are time overlaps, since some stakeholders have little time. This is sometimes combined with a lack of commitment, since interest needs to be created in the first place. In this regard, end-users, in particular, may be less concerned with the strategies and more concerned with the financial gain. Another common perception is that residents often do not view themselves as real stakeholders that are important in the process. To prevent this, they should be addressed with clear concepts showing the possible gains and their role in the process. Another challenge experienced was that not everyone was familiar with the culture of cooperation (e.g. the workshop format). This could be a challenge, especially in countries with fewer participation processes. A lack of communication among stakeholders (residents, business owners, public administrations, utilities, etc.) adds to this problem.

Challenges in the Financial Sector

Financial challenges relate to the real or perceived availability of short and long-term funding and the financial risk associated with cooperative energy projects. Experience shows that the own financial contributions, which are necessary to apply for some funds, are not feasible for some actors, especially in countries with no or few (co-)funding schemes. There is also a lack of funding transparency since funding schemes are not always easy to access or very visible. A central national website in the local language could function as a navigator in helping to find the most suitable funding. There is also the perception that there is insufficient funding regarding cooperative energy planning since it is a very specific topic. This also concerns access to funds that enable investments in infrastructure.

Challenges in the Technical and Technological Sectors

Technical or technological challenges relate to the functionality of the system design, such as its integration with existing systems and the approaches used to monitor its use. A common challenge is data collection relating to any kind of energy-related information. Information is needed to understand end-user demands and system capacity. In addition, the implementation of ICT tools requires data from, e.g., the buildings' energy performance and the end-users' demands. Finally, there are different standards of metering integration, interfaces, management protocols, etc. This challenges the transfer of the concept.

Challenges in the Societal Sector

Societal challenges relate to the stakeholder perception of district-level energy planning, which is inter-dependent with their knowledge of the system and its benefits that influence their engagement with new technology and tolerance for disruption during the implementation phases. Some of the challenges in this area have been discussed in the above section (titled Challenges of Cooperation). Generally, processes are difficult to understand for citizens and they are often not embedded in decision-making, which increases costs when resistance is high. In addition, citizens often do not have a strong lobby or financial background to participate equally in processes in which they should be involved. In general, there is a (perceived) lack of good practices on cooperative processes that shows how to motivate tenants, building owners and other stakeholders together.

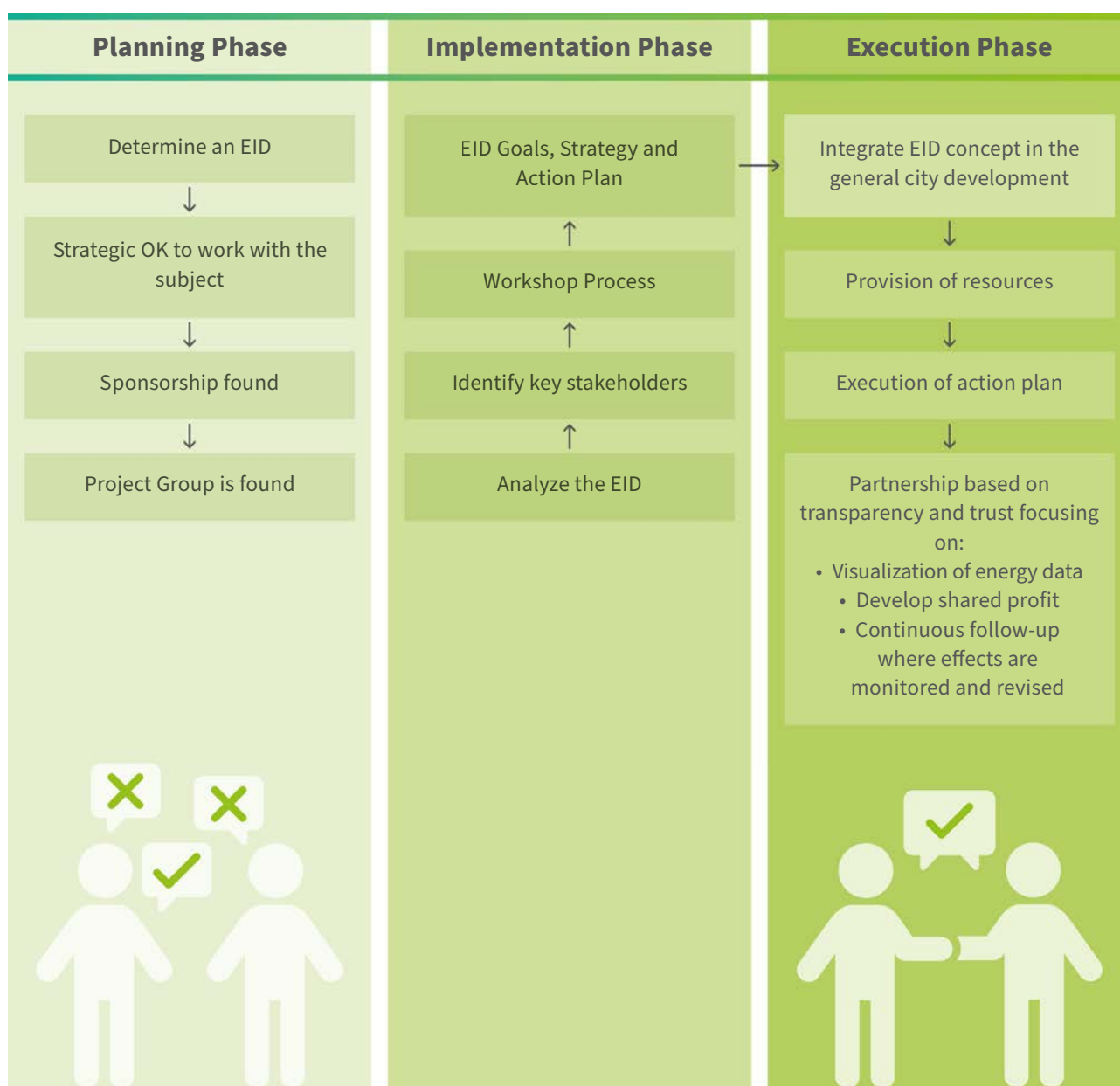
Challenges in the Public Sector

Administrative or legislative challenges relate to processes and regulations that govern the implementation of district-level energy planning. The short-term timeline for many projects can be considered a challenge since public authorities require long-term planning, solving problems systematically in the framework of a long-term programme. In addition, there is a lack of regulation at the district level as legislation mostly addresses the building level. This means that administrations have no concrete guidance on how to introduce new codes or legislative acts.

Specific Guidance for Initiating an EID

In addition to providing an understanding of the EID concept and its benefits and challenges, this publication also includes the necessary steps for realizing the model. It describes the phases of EID implementation, from its planning to its execution. Figure 2 gives an overview of these phases. The planning phase refers to the preparation for implementing the EID, incorporating steps such as delimiting the EID area, establishing collaboration and identifying the sources for financing. The implementation phase follows the conclusion of the planning. It deals with the analysis of the status quo, identifying and exchanging with the relevant stakeholders, and decision-making regarding the goals and measures. After this, the execution phase can begin. This phase comprises all the necessary steps to realize the initiatives defined in the implementation phase, e.g. the gathering of resources, the execution of plans, etc.

▼ **Figure 2:** Phases of the process model.



What Is Required for Planning?

Key Messages

- Several steps in the three phases can be used as guidelines for planning, implementing and executing an EID.
- The steps are transferrable and can be applied to context-specific cases.
- For more detailed information on the steps, refer to Energy Improvement Districts – Conceptual and Technical Guidance for Implementing Cooperative Energy Planning at the District Level (AREA 21, 2020)



The specific guidelines for cooperative energy planning at the district-level show the transferrable steps needed to establish the EID concept. They guide the organization of multiple stakeholders, reaching an agreement on what they want to achieve together and what the best way to do this is. These model steps orient stakeholders from cities and regions regarding (1) collaborative problem definition and analysis, (2) collaborative goal formulation, (3) cooperative integrated strategy development and (4) decision-making support. They comprise the first actions in identifying strengths and weaknesses, challenges and opportunities, individual paths of future energy development and possibilities for integrating the results in local decision-making processes.

A first step is to identify the initiating organization and the potential partners required to achieve the goals, and to form a group with these partners. Together, this group elaborates and agrees on the common goals, objectives and activities. In a further step, the partners collaboratively collect data and analyse the possible action areas. This is to define the status quo that allows an evaluation of the impact of measures. If the EID concept is selected as an instrument to achieve these targets, the group can use the main outputs of AREA 21, i.e. “Energy Improvement Districts – Conceptual and Technical Guidance for Implementing Cooperative Energy Planning at the District Level”, for inspiration and guidance (AREA 21, 2020).

More detailed planning begins with the determination of an EID based on a previous analysis of needs. The EID could be characterized by existing urban areas and thus be very context-specific. The AREA 21 cases include a hospital area, a university, a mixed-use area with housing, businesses and public buildings, and a housing area owned by a large housing cooperative. Furthermore, the EID could also be determined based on the strong interest and commitment of stakeholders in the area. These include: public authorities responsible for energy planning, urban and sustainable planning and other related fields (experts, government officers and policy makers); cooperatives, associations or owners (willingness to participate in the strategic and decision-making process to reduce energy consumption through measures applied to

the property or to permanent/fixed property appliances and by providing access to energy usage data); and energy utilities (to develop their services to fit with the future energy systems and thereby secure future profits). It is also recommended to select districts with existing or concurrently run initiatives of cooperation formats, e.g. business or housing improvement districts, previous research projects on energy or refurbishment topics and previous, current or planned redevelopment projects.

The committed organisations initiating the cooperative process need to ratify the EID. This is both to support and participate in the upcoming work, as well as appoint an EID coordinator. The EID coordinator will be responsible for future work and is a key resource, serving as a driving force as well as being the “spider in the web” in the upcoming EID work.

The execution of a local cooperation process in an EID requires sponsorship. The EID coordinator is responsible for presenting the project charter on behalf of the strategic group of organizations who have signed the letter of intent. Funds for the sponsorship of the upcoming project as well as the work of the project leader could be either international or national public funds or could be funded by the stakeholder group.

After receiving funding, the EID coordinator forms a project group. The project group should consist of members from each organization that have identified the benefits of working together towards the common energy and climate goals. This group preferably consists of diverse stakeholders, from citizens or representative associations to private and public actors, in order to have a broad ownership and the active support of all parties.



What Is Required for Implementation?

Key Messages

- Workshops are a core instrument for implementing the EID and ensuring the support and input of the stakeholders.
- A strategy with clear visions, goals and a plan on how to achieve them should be developed.
- An action plan to support the execution of the strategy should be developed.
- For detailed information on the process, refer to Energy Improvement Districts – Conceptual and Technical Guidance for Implementing Cooperative Energy Planning at the District Level (AREA 21, 2020).



The implementation phase of the EID follows the planning. The project group or team should start by describing the status quo of the EID. During the analysis of the EID, a vision should be developed for the area which will be used to explain the future scenario of the EID to stakeholders and in other external communication. According to the goals, and based on the previous identification of stakeholders, the project group or team should begin identifying the key stakeholders in the EID. This is an iterative process which should be repeatedly performed in different contexts to identify all relevant stakeholders. The analysis results in a stakeholder map which shows the stakeholders in terms of their decreasing level of influence and interest.

A plan for organizing workshops with the identified stakeholders should be elaborated, for example by using the “Guidelines for the Organization, Documentation and Evaluation of Local Workshops in EIDs” (AREA 21, 2018).



▲ Study visit Wieniawa EID,
Poland.

The key aim of the workshops should be to support the stakeholders in the work of cooperative energy planning and to establish a long-lasting cooperation. Pre-meetings with the key stakeholders to introduce them to the EID concept and prepare them for the first workshop should preferably take place before beginning the workshop process. In addition, in-between-meetings during the workshop process will enhance progress. Four workshops were included in the AREA 21 project.

Two main results are the development of a strategy for achieving the mutual goals of the EID and the development of an action plan that supports the realization of the goals, objectives and actions formulated in the strategy. The purpose of the EID strategy is to steer the development of the cooperative energy planning process in the EID by establishing a common understanding between the different local stakeholders of the main goals and objectives for the improvement of energy efficiency in the area. The strategy should illustrate a clear path from the present state (present conditions in the EID) to a shared vision for its future development. The action plan should precisely describe the actions required to support the fulfilment of the strategic goals and allocate clear time frames, responsibilities and measures. For further information on the content, goals and outcomes of the workshops, please refer to “Energy Improvement Districts – Conceptual and Technical Guidance for Implementing Cooperative Energy Planning at the District Level” (AREA 21, 2020).

What Is Required for Execution?

Key Messages

- Integrate the EID concept into the general city development plan.
- Allocate resources to execute actions in the EID.
- Collaboratively generated outputs (e.g. vision, goals, strategy and action plan) build on each other and promote the successful execution of the EID.

In the execution, it is important to integrate the EID concept into the general city development plan. This could be achieved by presenting the concept to local and regional policy makers and politicians. Ideally, these would embrace the concept and participate in the process from the beginning, both supporting and consulting to it. If the concept is introduced to them at a later stage (before execution) it is important to get their support at this moment in order to ensure new project plans have the EID methods in mind when the process starts and that they build on existing and holistic planning structures.

As a result of integrating the EID concept into the development plans, resources can be allocated to projects and actions within the EID. This is vital both for the process to be initiated as well as later on for the implementation and execution of measures in the action plan.

The EID concept generates a collaboratively developed vision, goals, strategy and action plan for the defined area. These different outputs build on each other to create useful tools in the continued energy efficiency work of the EID. The action plan should have structured activities, allocated responsibilities and a clearly defined time frame to be successfully executed. To ensure the further progress of the action plan, its activities need to have a continuous follow-up and be well monitored. The activities should preferably be performed iteratively, where the involved organizations increase both knowledge and skill alongside the progression. For this, possible barriers can be identified and advancement can easily be communicated to the sponsors and project participants, which in turn will benefit the established cooperation. The proposed EID coordinator could manage the entire process and facilitate the successful implementation of the EID.

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Project Summary

AREA 21 addresses the need for energy efficiency by fostering cooperation practices for strategic planning at the district level. The project proposes the development of innovative tailor-made solutions, appropriating the perspectives of a diverse group of stakeholders to address local issues in synergy with energy efficiency matters. The collaborative character of this approach contributes to the legitimacy of the process and when associated with the search for synergies, it results in context-appropriate and multi-faceted initiatives. As a result, AREA 21 expands and strengthens cooperation networks, supporting the implementation of innovation for sustainable development with a focus on energy efficiency.



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