ESTABLISHING SPATIAL ENERGY PLANNING FOR AUSTRIA'S ENERGY TRANSITION

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1 SUMMARY

This paper underscores the significance of spatial energy planning as a pivotal instrument for achieving a successful energy transition, using insights gained from the Austrian national project GEL S/E/P. The project aims to enhance spatial energy planning processes by introducing a standardized energy atlas that provides geodata and automated reports. By emphasizing the key components and output data layers of the atlas, this paper showcases its practical applications in the context of local development planning. Moreover, the introduction of a user-friendly GIS-based web service, powered by the energy atlas database and the open-source LizMap client, is highlighted for its role in engaging various professionals, including energy planners, city planners, civil engineers, and energy specialists in public administration.

Keywords: *Spatial Energy Planning, GEL S/E/P Project, Energy Atlas, Geodata, Automated Reports, GIS-based Web Service, Local Development Planning, Municipal Heat Planning, Energy Transition*

2 INTRODUCTION

2.1 GEL S/E/P - Spatial Energy Planning for Energy Transition

Since its inception in 2019, the GEL S/E/P project series [1] has been dedicated to laying the groundwork for effective spatial energy planning. Focused on Salzburg, Styria, and Vienna provinces, the project aims to develop a tailored digital energy atlas with high-resolution spatial information and reporting functions. Engaging with authorities and policymakers, it addresses legal framework conditions. The energy atlas includes detailed data on buildings, renewable energy potentials, and grid-based infrastructure, facilitating municipal energy system analysis and planning [2, 3, 4]. In its initial phase, the project established the Spatial Energy Planning (SEP) system for the heating sector. The subsequent phase expands it to mobility and electricity, creating a cross-sectoral information platform. The project enhances results, supports federal states in SEP execution, and contributes to defining regulatory conditions. Overall, the GEL S/E/P initiative represents a significant step towards a more streamlined and efficient approach to spatial energy planning in Austria, contributing to the broader goal of a successful energy transition.

To enhance accessibility, the energy atlas will be available to communities through on-demand web services, primarily using Web Map Services (WMS) from federal state GIS systems like ViennaGIS, GIS Steiermark, and SAGIS Salzburg. The prototype's deployment is actively progressing in demonstration regions, with a full operational launch expected by May 2024.

2.2 Practical applications for spatial energy planning and GIS-based services

The practical applications of data extracted from the energy atlas span various aspects of local development planning. One significant application involves the formulation and execution of local and regional climate action plans. Utilizing the detailed spatial information on renewable energy potentials and energy infrastructure provided by the energy atlas, municipalities can craft targeted strategies to reduce carbon emissions and bolster sustainability. The atlas facilitates the identification of suitable areas for renewable energy installations, thus integrating clean energy sources into climate action initiatives.

Building renovation and decarbonization roadmaps represent another critical application area where the energy atlas plays a pivotal role. By employing the advanced building energy model and detailed spatial information on buildings, municipalities can develop comprehensive plans to renovate and decarbonize existing structures. Likewise, municipalities can optimize the planning and implementation of district heating systems by analyzing data on local renewable energy potentials and energy demand. This involves identifying suitable locations for district heating hubs, assessing the feasibility of integrating renewable energy sources, and ensuring efficient heat distribution across strategic zones.

Zoning and infrastructure planning also have a strong connection to the electricity sector. In the context of photovoltaic (PV) installations, the energy atlas provides insights into optimal locations for solar energy generation. It aids in determining areas suitable for electricity grid expansion to accommodate increased renewable energy capacity. Moreover, it supports infrastructure planning for the deployment of heat pumps and electric vehicle charging stations, contributing to the overall advancement of sustainable urban development.

To enhance the accessibility and utility of the data foundation for specific application domains and stakeholders in spatial energy planning, the authors have recently focused on developing more versatile GIS-based services. This paper sheds light on databases, selected methodologies, and resultant output layers of the GEL S/E/P energy atlas, emphasizing practical use cases encountered in spatial energy planning. Notably, the chapter introduces a user-friendly spatial energy planning tool that leverages the open-source LizMap web client. The tool is designed with a low-threshold entry point, ensuring accessibility for diverse stakeholders and applicability to various use cases in spatial energy planning.

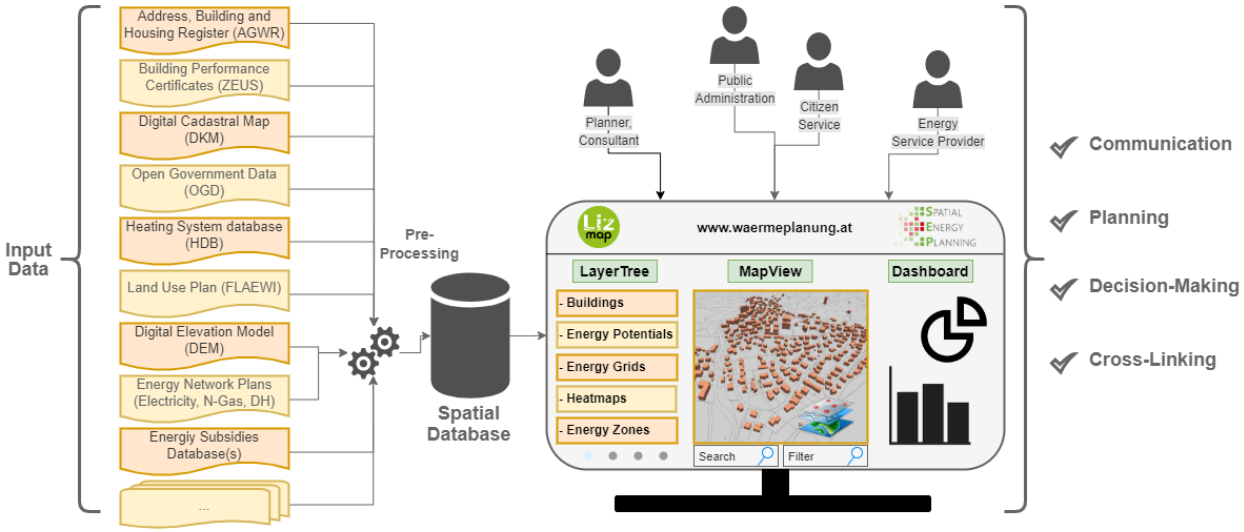

Fig. 1: GIS-based service environment for spatial energy planning in cities and communities

3 REFERENCES

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4 CONFERENCE TOPIC

Spatial Energy Planning (cross-cutting theme)