

Digitizing Municipal Energy Planning

A Bottom-up RE-planning Tool for the new Federal Context of Nepal

The challenge

Nepal has moved from a unitary to a federal government system and has devolved authority to local and provincial governments to design policies, make decisions and deliver public goods and services. This restructuring process of the Nepalese state also results in a paradigm shift in how decentralized renewable energy (RE) will be promoted.

The Alternative Energy Promotion Center (AEPC) is the national level government agency for the decentralized RE sector in Nepal. Over its two decades of existence, it has been responsible for policy making, planning, and implementing decentralized RE. It was AEPC’s main task to provide subsidies, collect demands, plan RE systems and oversee their construction at community level. In the new federal structure, this mandate has been transferred to newly established local and provincial governments. Thereby, federalization provides the opportunity to increase accountability and make economic development more inclusive and bottom-up.

However, the newly established local and provincial governments lack capacities and means to take up their new tasks relating to decentralized energy. Additionally, AEPC is undergoing a fundamental transition from an agency that provides services like subsidies directly, to providing support services to provincial and local governments for promoting and implementing Renewable Energy Technologies (RETs).

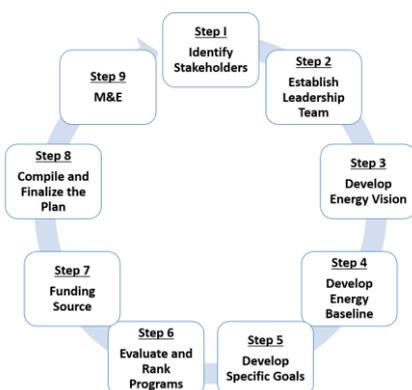
Our approach

The Renewable Energy for Rural Areas (RERA) programme is a bilateral measure of the Government of Nepal and the Government of Germany to support the decentralized RE

sector in Nepal. The programme is jointly implemented by the Alternative Energy Promotion Centre (AEPC) and by Deutsche ‘Gesellschaft ‘für‘Internationale‘ Zusammenarbeit (GIZ) GmbH, commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ). RERA is supporting the Government of Nepal to ensure efficient and effective service delivery of ‘decentralized renewable energy in the new federalized context, by (1) capacitating the newly established local and provincial governments, and (2) assisting AEPC in its transition from an agency of direct service delivery to a support agency. To support this transition, RERA is working together with AEPC to develop a service portfolio that will help provincial and local governments to plan, promote and implement decentralized renewable energy. One of these services is a Municipal Energy Planning (MEP) tool which will enable local governments to integrate RE into their planning process.

The solution

The MEP tool is a digital solution that enables municipalities to set up targeted support programmes for RETs based on sound data analysis. A centrally hosted Geographic Information System (GIS) database is at the heart of this system. The MEP tool includes a mobile survey app that automatically feeds into the database and helps to assess the energy situation of households, businesses, communities and collect data on existing energy infrastructure (national grid, mini-grids, off-grid technologies). The field data is complemented with secondary data (e.g. population data). The tool allows to disintegrate and aggregate data based on the administrative boundaries of the new federal set-up (national, province, municipality, ward and settlement).



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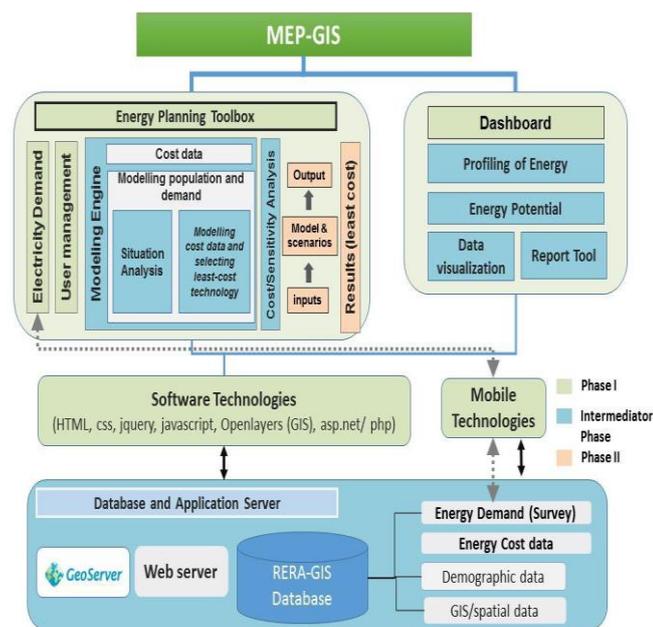
- A proposed nine- steps municipal energy planning process for the (rural) municipalities
- Provincial map of Nepal

It provides a portal to each municipality to use and feed in, as well as analyse data, and conduct energy planning. By aggregating data to higher levels, this tool allows to provide relevant inputs to provincial and the federal governments for energy planning, monitoring and policy making.

The tool also includes a data visualization dashboard for the municipalities that gives a quick glance of the existing RE situation in their jurisdiction. In order to conduct energy planning based on the processed information, the tool helps municipalities to project future energy demands and identifies the best suitable technologies for improving the energy access situation of their citizens. To do so, algorithm will model the cost for expanding RETs and conduct a leveled cost analysis, and thereby identify a least-cost option for a given settlement.

By integrating geo-spatial-data with demographic and development scenarios, the tool will provide fact-based visualizations and projections for local energy planning.

The conceptual system architecture of the MEP Tools is presented below. The key building blocks for the tools are the energy planning toolbox, the dashboard and the server.



Implementation Strategy

The MEP tools is being developed in a phased approach: In the first phase the design process will be iterative, meaning that versions of the tool (including the mobile app and algorithm) will be tested in the field and experiences gathered will be used to refine the tool.

In the second phase, the MEP will be piloted in selected municipalities to gather lessons learnt and finalize the tool. This includes the optimization of the planning tool for simultaneous multiple-user access and data upload with user friendly interfaces. In a third phase, the model will be rolled out by AEPC, deployed in all 14 partner municipalities of RERA and will be integrated into the institutional framework of provincial governments.

Across all three phases, capacity development and backstopping are considered as an integral activity to operationalize the tool in the new three-tier government structure. This applies especially for enabling understaffed municipalities to leverage all benefits of the tool.

Value Addition

The IT based planning approach is developed to add value for the three levels of government (federal, provincial and local) to support data-driven RE analysis, evidence-based planning, policy making, investment and monitoring. Data-driven decisions enable cost-effective and achievable outcomes for the accelerated deployment of RETs in the municipalities. Additionally, it enables municipalities to collect and analyse data with a minimal input of human resources. Since the tool aggregates data, it allows provinces and the federal government to understand the energy-access situation, monitor development make informed policy decisions.

Furthermore, the MEP helps AEPC in its transition to a support-agency. The MEP is part of the service package that AEPC can offer to provinces and municipalities, and it allows AEPC to advise the federal government on policies, goal setting and investment decisions.

Published by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

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As at March 2018

GIZ is responsible for the content of this publication.

In cooperation with Alternative Energy Promotion Centre (AEPC)

On behalf of Federal Ministry for Economic Cooperation and Development (BMZ)

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