

Development of Sustainability Indicators to Drive Innovation for Energy Transitions in Värmland

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Decentralisation, capacity development and public trust and participation are imperative for sustainable energy transformations in Sweden.

The climate crisis, recent geopolitical instabilities and increased electrification in industries, transport and households have led to an energy crisis in Sweden since 2021. Nationwide energy transformation aiming to ensure a clean and plentiful energy supply has been adopted at regional and municipal levels. Renewable energy technologies like solar and wind have been favoured as battery capacity has increased and renewables generate the cheapest electricity while lowering carbon emissions. Policies have supported this landscape shift through tax and tariff design, incentive programmes and market regulations. However, public resistance to new renewable energy developments is increasing, particularly regarding wind farms, which demonstrates a critical lack of public trust and participation in the current centralised and top-down energy supply model. Energy communities that were incubated based on local energy innovation received relatively few policy incentives and government support for scaling up and formalisation. As the ongoing energy crisis is projected to intensify, policymakers require high-quality information based on solid indicators to strengthen public trust and participation and develop support mechanisms for local energy innovation projects.

Current regional development strategies, such as the Värmland Strategy 2040, and energy and environment plans adopt a centralised top-down energy supply plan by expanding the national grid while establishing

new solar parks and wind farms. Carbon neutrality by 2045 is prioritised along with the development of a forest-based bioeconomy, which will be supported by the development in the business sector and cutting-edge technology. However, few incentives are provided for social and behavioural changes, and processes for ensuring public participation and social innovation are rarely monitored or measured. Different actors prioritise an energy future where: (i) energy production is fully decentralised through place-based social innovation, (ii) capacity development for the management of decentralised energy production, distribution and administration is prioritised for government and non-governmental institutions, energy communities and citizens, and (iii) public trust and participation in energy transformation processes are enabled via multiple platforms and channels. The desired energy future should be materialised through intermediate and contingency plans, where place-based social innovation should be boosted by public-private collaboration and partnerships, flexible grid infrastructures and hybrid energy production units. Market mechanisms, incentive programmes and regulatory frameworks should prioritise municipalities that are under-resourced and lack knowledge and skills for ensuring public trust and participation. A sustainable energy transformation process should ensure the active involvement of children, young people and civil servants.



Photo: Helena Edström

Within the framework of the project DIET – Development of Sustainability Indicators to drive Innovation for Energy Transition, funded by the Swedish Innovation Agency (Vinnova), we have organised a series of workshops with energy actors from Värmland County, including representatives from the County Government, Regional Development Authority, Confederation of Swedish Enterprise, Capacity Building and Development NGOs. We have applied the Delphi method during the workshops to reach a consensus among the actors on: (i) the status of social innovation and public participation in the energy transformation process in Värmland and how they are measured and monitored using indicators, (ii) the energy future that we want and the aspects of social innovation that we need to measure and monitor, and (iii) the strategic steps we need to take and the timeline for their implementation to achieve the energy future we want. The input from the workshops was compiled, analysed and summarised into suggested indicators, which were presented and validated during a final meeting of energy actors. The input from the final meeting was then systematically assembled into policy insights for enabling public trust and participation and supporting social innovation for a sustainable energy transition across Sweden.

PROJECT WEBPAGE

<https://glavaenergycenter.se/en/projects/previous/diet--measuring-a-sustainable-energy-transition.html>

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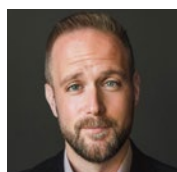
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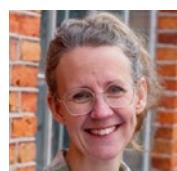
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THE ROAD FORWARD FOR POLICY

1. Decentralisation of energy production through the establishment of new energy communities and increasing household and industry access to existing energy communities is key to energy security. Place-based social innovation thus has to be supported by the timely development of the legal frameworks, incentive programmes, grid infrastructure and flexibility.
2. A new arena for collaboration and exchange among local innovative projects across municipalities and regions is crucial for co-development and co-ownership of diverse energy solutions. Such an arena should actively involve and host input from children, young people and civil servants.
3. Resources should be prioritised and mobilised for capacity building at regional, municipal and community levels through competence development centres that will train system and process leaders and energy advisers. New education programmes, research and development and meeting points such as citizen advice centres can support capacity building among citizens.
4. Policy incentives should target municipalities that are under-resourced and lack skills and knowledge for enabling public participation in the energy planning process in the form of citizen assemblies or similar. This is key to driving behavioural changes and also building trust among citizens in municipal energy plans and trust across governing bodies.
5. Timely and long-term energy plans with intermediate and contingency measures informed by regional and municipal contexts, opportunities and prerequisites should inform and shape transformative energy policies.

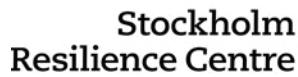


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