



# GENTE Future Energy Community Scenarios

Deliverable 3.1

## SUMMARY

This report presents the results from an investigation into the principal drivers for the growth and decline of community-focused energy initiatives in Europe. A set of future energy community scenarios based on the factors that enable energy community success is developed. In doing so, this report explains the context of the GENTE toolkit, and helps inform the development of technology, modes of community engagement, and recommendations for exploitation that form important parts of the GENTE project.

# Impressum

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Co-creating with partners that help to understand the needs of relevant stakeholders, we team up with intermediaries to provide an innovation ecosystem supporting consortia for research, innovation, technical development, piloting, and demonstration activities. These co-operations pave the way towards implementation in real-life environments and market introduction.

Beyond that, ERA-Net SES provides a Knowledge Community, involving key demo projects and experts from all over Europe, to facilitate learning between projects and programs from the local level up to the European level.

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# Abstract

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The ERA-Net GENTE project aims to develop a distributed governance toolkit for local energy communities (LECs) and, more generally, energy communities (ECs). This toolkit will include advanced digital technologies such as internet of things (IoT), distributed ledger technology (DLT), edge processing, and artificial intelligence (AI) for autonomous energy resource management within and across LECs and for flexibility provisions to energy networks. The toolkit will also consider social processes and include a set of guidelines and methods for developing new LECs with potential end-users and further stakeholders.

Energy communities are poised to play a significant role in Europe's energy transition, with projections indicating that collective initiatives such as ECs could contribute up to 37% of renewable energy by 2050 [1]. However, the history and evolution of this type of community, along with the factors influencing their success, remain complex and diverse. This report, based on research conducted as part of Work Package 3 (WP3) of the GENTE project, investigates the dynamics of ECs, encompassing their definitions, historical trends, regional variations, and future prospects.

The research examines the historical growth and decline of ECs, revealing the interplay between economic, legal, and regulatory factors. Regional disparities in EC adoption are linked to differences in regional policies, financial support, and cultural attitudes. Key factors are identified shaping the enabling environment for the growth of new and existing ECs, including government incentives; stable, long-term supportive policies; and suitable financial support. It also highlights the importance of collaboration, professionalisation, and commercialisation of ECs for their sustainable development.

The report concludes by presenting eight Future Energy Community Scenarios (FECS) predicting outcomes based on various contextual factors from the enabling environment and future evolution insights. These scenarios aim to inform the development of the GENTE energy community toolkit, guiding technology development, community engagement strategies, and recommendations for effective exploitation. Overall, this report provides valuable insights for the GENTE consortium into the past, present, and future of energy communities, offering a roadmap for their continued growth and relevance in Europe's energy transition.

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