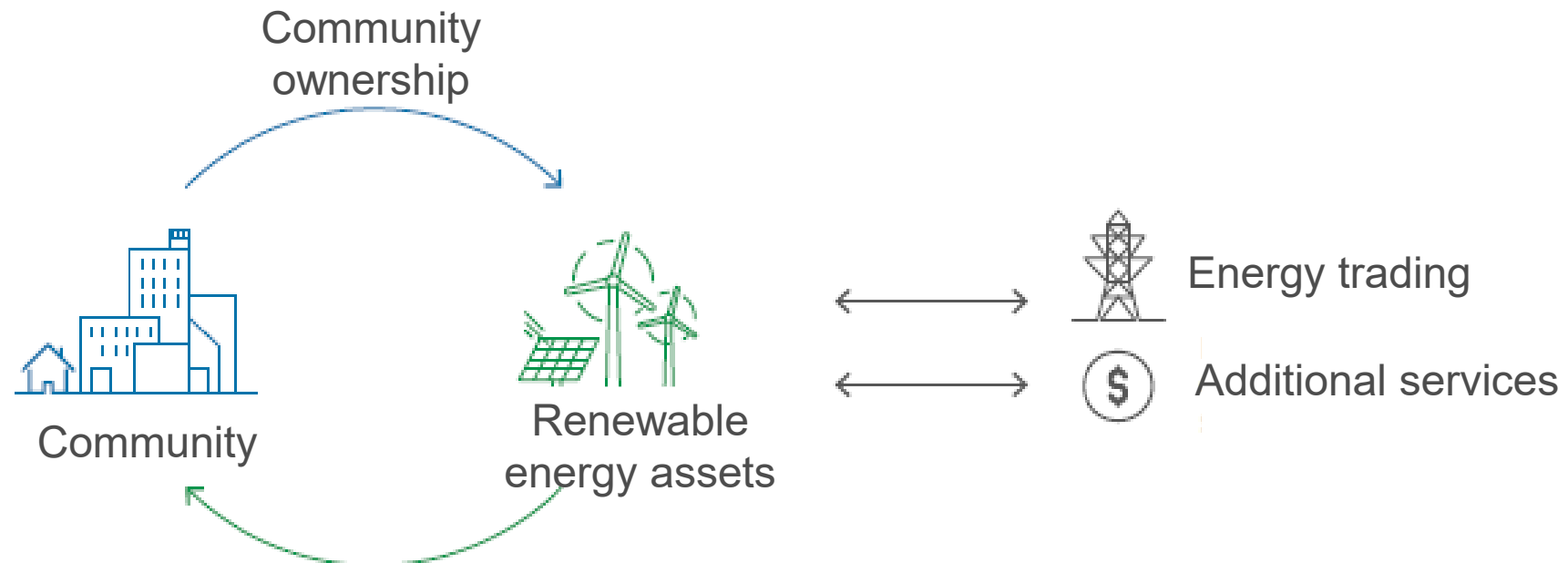


From Vision to Action: Building Sustainable Energy Communities in Colombia

intersolar Off-grid Power Workshop

Dr. Georg Heinemann
Workgroup for Economic and Infrastructure Policy, TU Berlin
June 20th 2024

What is an energy community?



Socio-economic benefits for communities:

- Electricity generation, storage, heating, cooling.....
- Community empowerment, energy security independence, job creation, ...

Source: IRENA (2020), *Innovation landscape brief: Community-ownership models*, International Renewable Energy Agency, Abu Dhabi.

What is the situation in Colombia?



- 96% of population is covered
- 16.5 GW installed generation capacity (2022)
- Main source is hydropower, followed by fossil fuels. Solar and wind still only minor contributions.
- Non-interconnected areas: 52% of the national territory and 4% of the population
- Energy supply in these areas by standalone, fossil fuel-based systems

Source: Guidelines for energy communities in Colombia, technical report (2023). A.M. Ramírez-Tovar, L. Duque Restrepo, M.C. Rodríguez, J.M. España Forero, J.P. Cárdenas. Transactive Energy Colombia - EnergEIA

Scope of the project (1)

1. Benefits of Energy Communities:

- Enhance energy efficiency
- Promote renewable energy
- Empower end-users
- Address global concerns: energy security, climate change, and social inequalities

2. Situation in Colombia:

- Significant potential in solar, wind, and hydropower
- New government promotes energy transition and development
- Energy communities as a strategic element to promote and implement changes
- Objective to democratize energy access and support social equity + cohesion

Scope of the project (2)

3. Challenges in implementing Energy Communities:

- Financial hurdles
- Complex organizational and administrative tasks
- Strong legal and operational frameworks
- Additional challenges unique to Colombia: weak social fabric and high transaction costs

4. Research and project objective

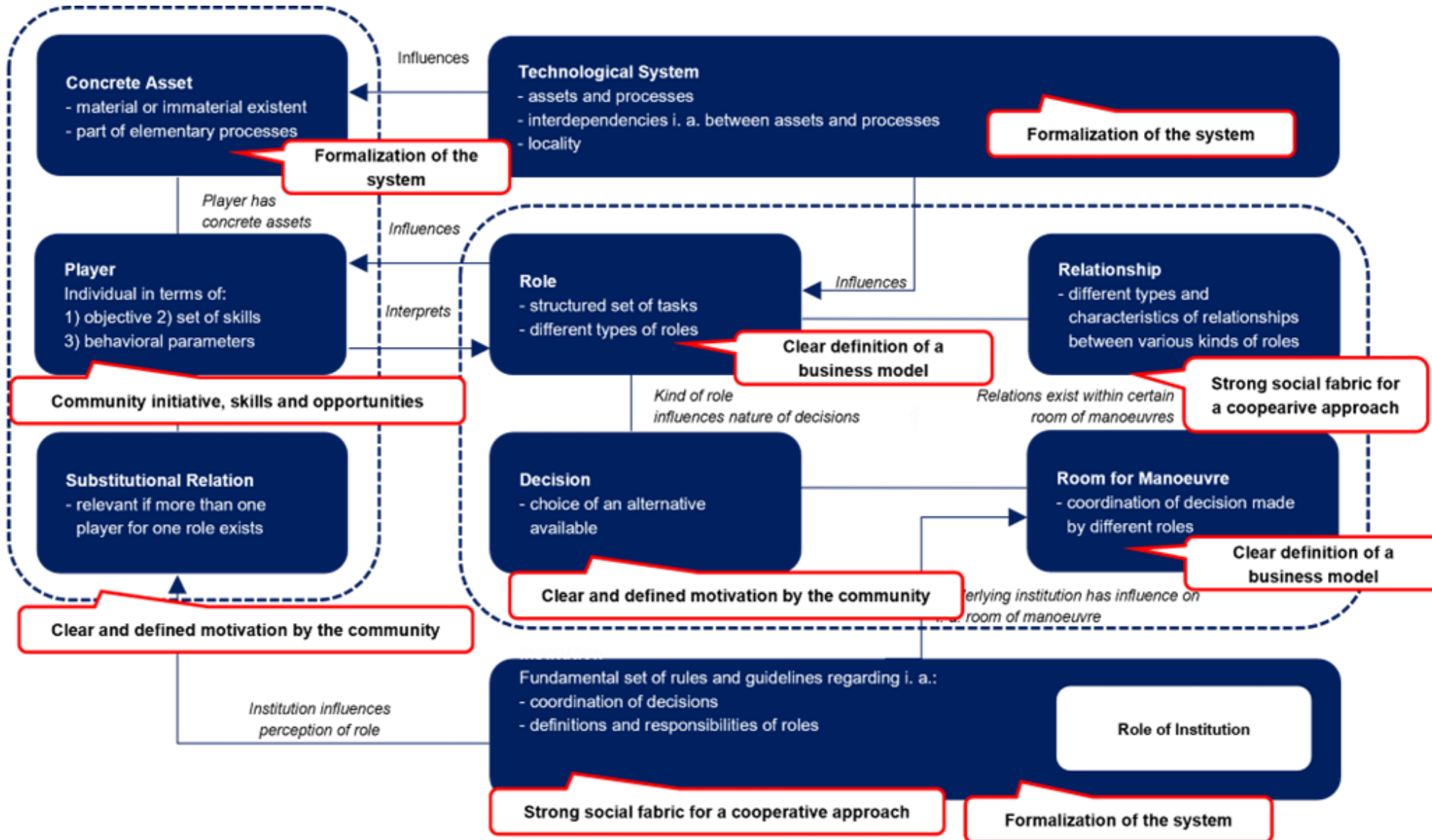
- Building up a holistic framework, with tailored sustainability parameters for the Colombian context
- Drawing lessons from Europe
- Integration of New Institutional Economic perspective and the Organizational Model Framework
- Goal: Promotion of a bottom-up approach, implementation of pilots and preparing country-wide scale up

Grouping criteria under a collective variable

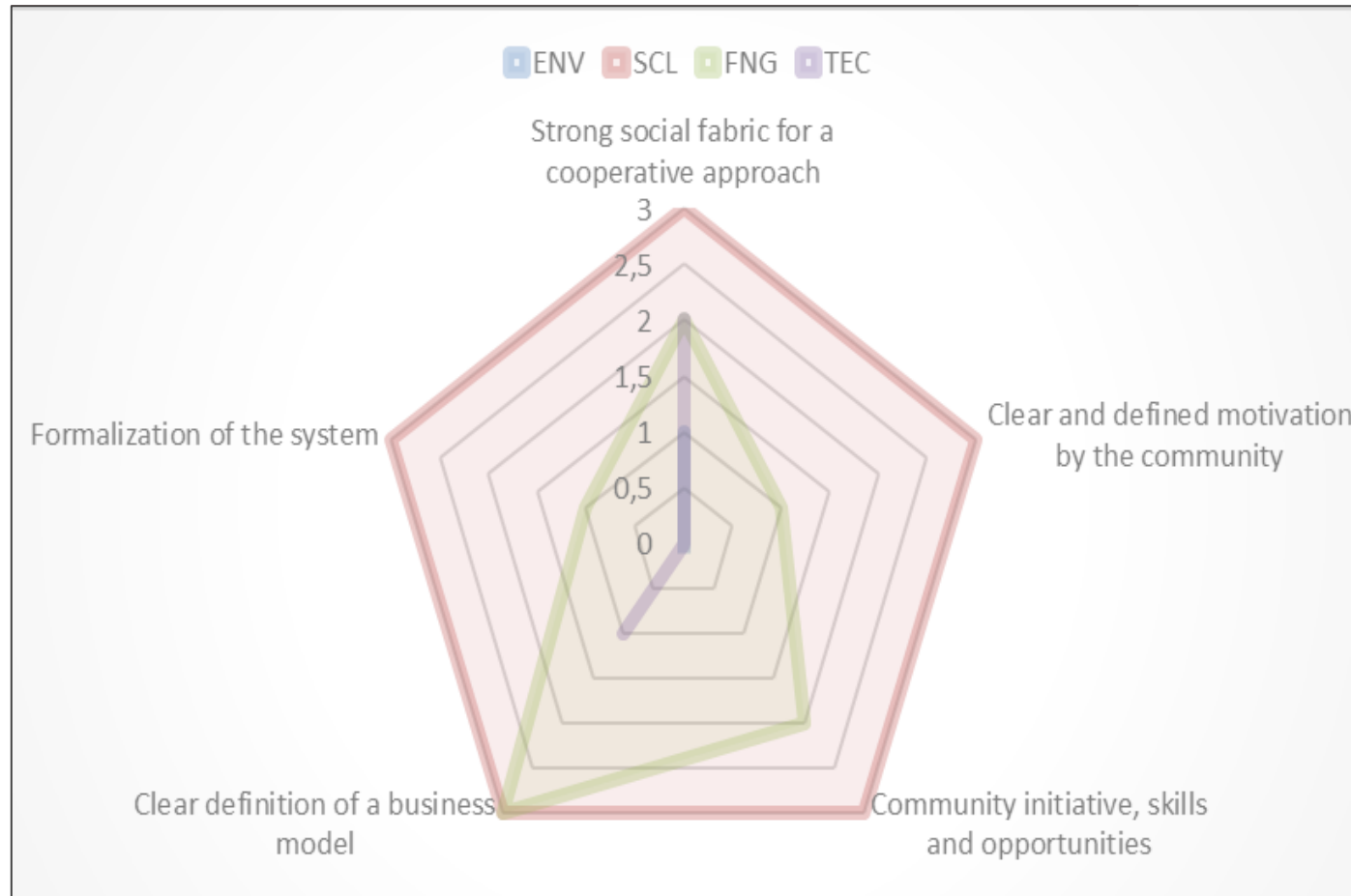
Relevant criteria than can be a sustainable variable	Grouping under a collective term
Combat misinformation and strengthen social fabric	<i>Strong social fabric for a cooperative approach</i>
Effective team management and advisory support are vital	
Understanding local complexities is crucial	
Risk management is essential, especially early on	
Educate communities about hourly consumption and energy prices	
Empower individuals to make informed energy choices	

- A mixed-methodological approach was applied
- Extensive literature review combined with stakeholder interviews
- Identify and draw lessons from European experience
- Relevant findings clustered and grouped under a collective term

Locating the variables within the organizational model

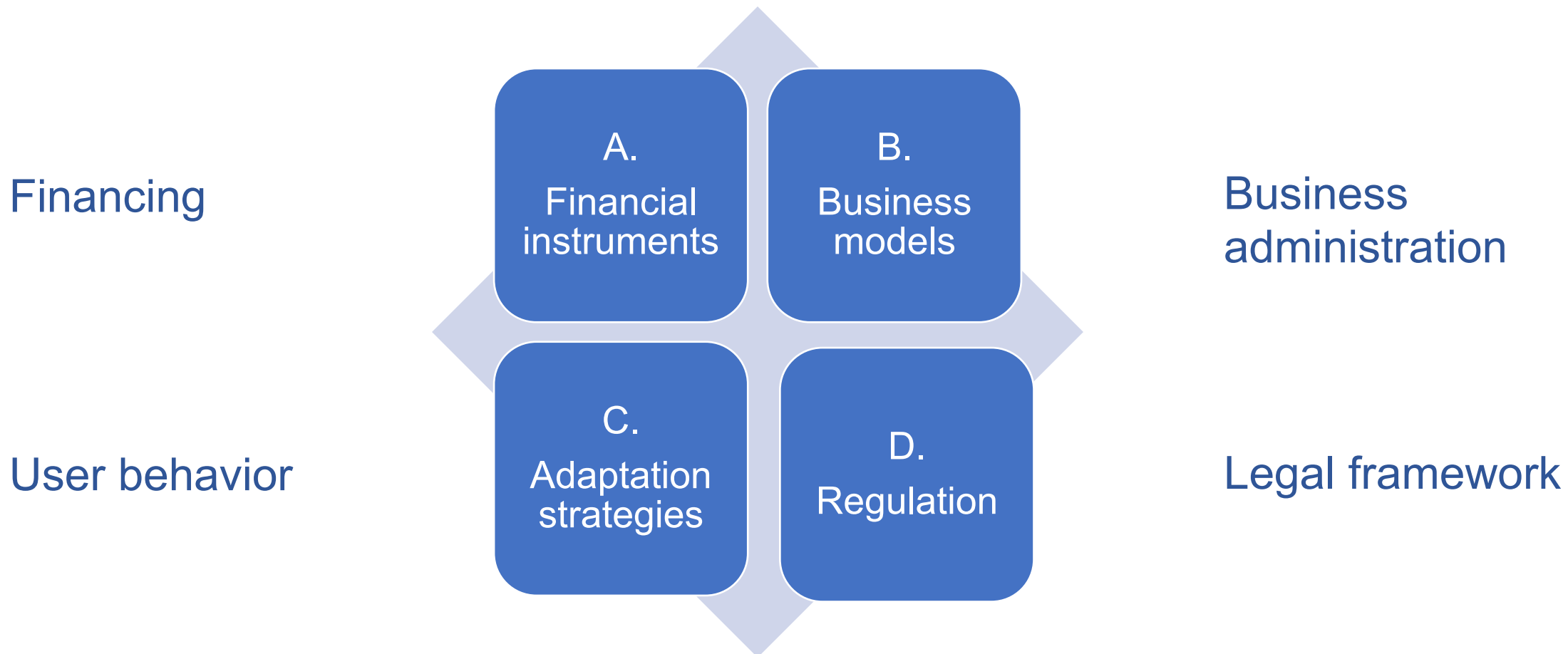


Sustainability rating of the five variables



- Sustainability is a dynamic process balancing human well-being, social justice, and environmental concerns
- This study evaluates sustainability in five components: environmental (ENV), social (SCL), financing (FNG), and technical (TEC)
- The result emphasizes social and financing aspects as most crucial, prioritizing community engagement and ownership over financing aspects

Key goals for the next step: project implementation



Conclusion



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BY GEORG HEINEMANN, ANA MARÍA RAMÍREZ TOVAR, PASHA ALIDADI, AND CHRISTIAN VON HIRSCHHAUSEN

Abstract

This study proposes sustainable variables for Colombian energy communities, inspired by European models. Key factors include social cohesion and financial support. Lessons from Europe inform above all local engagement and regulatory strategies for sustainability.

the Colombian context, such as a weak social fabric, high investment costs, grid connection complexities, lack of legal regulations, and the requirement for utility company status, pose additional hurdles (Energía y

Georg Heinemann and **Pasha Alidadi** are with Workgroup for Infrastructure Policy (WIP), Berlin University of Technology, and Microenergy Systems (ME-SY), Berlin University of Technology. **Ana María Ramírez Tovar** is with Ministerio de Minas y Energía Colombia. **Christian von Hirschhausen** is with Workgroup for Infrastructure

- Energy communities requires a strong social component, with community participation, behavioral change, and social cohesiveness laying the groundwork for long-term success.
- Prioritizing regulatory clarity and community engagement will be key for a sustainable scale-up of communities
- Published article available here: IAEE Energy Forum, [First Quarter 2024 \(116\): 36–44](#), ISSN: 1944-3188
- Design and implementation of pilot communities

Thank you very much for your attention!

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