

POWER TO THE PEOPLE

COMMUNITY ENERGY AND CROWDFUNDING

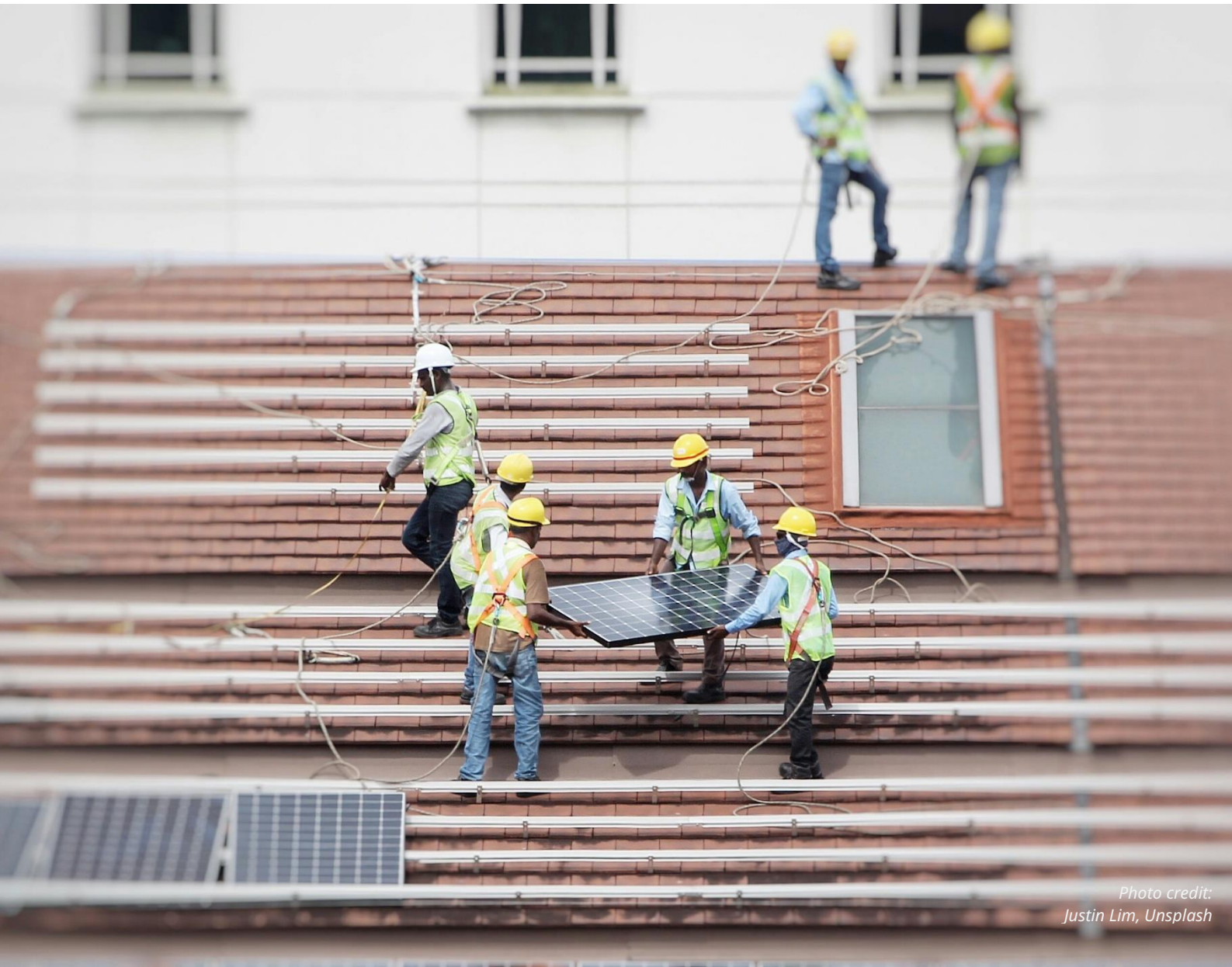


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ABOUT

This report was prepared under the 100% Renewables Cities and Regions Roadmap project. It aims to understand community energy and crowdfunding approaches from a just transition angle, analysing differences across the Global South and Global North along the way, while also providing several case studies and key takeaways.

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ABOUT THE 100% RENEWABLES ROADMAP

The 100% Renewables Cities and Regions Roadmap project facilitates the energy transition by raising local awareness on renewable energy sources, showcasing how local and national governments can create coordinated enabling frameworks and policies, exploring access to public and private sector finance, and building local renewable energy projects to address electricity, heating and cooling. The 100% Renewables Cities and Regions Roadmap is implemented by ICLEI and funded by the German Federal Ministry for the Economic Affairs and Climate Action (BMWK) through the International Climate Initiative (IKI).

ABOUT ICLEI – LOCAL GOVERNMENTS FOR SUSTAINABILITY

ICLEI – Local Governments for Sustainability is a global network working with more than 2,500 local and regional governments committed to sustainable urban development. Active in 125+ countries, ICLEI influences sustainability policy and drives local action for low emission, naturebased, equitable, resilient and circular development. ICLEI's Members and team of experts work together through peer exchange, partnerships and capacity building to create systemic change for urban sustainability.

ABOUT RENEW-SEA

The RENEW-SEA project is implemented by the ICLEI World Secretariat and the ICLEI Southeast Asia Secretariat. It aims to develop awareness and capacities related to sustainable energy and improve multi-level coordination in Southeast Asian countries.

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INTRODUCTION

The current climate emergency calls for coordinated action from the local, regional, national, and international levels to achieve the goals of the Paris Agreement and limit the rise in global temperatures to well below 2°C. The most promising pathway to achieve this is to reach net-zero greenhouse gas (GHG) emissions by 2050. Indeed, a rapid peaking of GHG emissions and a shift away from fossil fuels is a core pillar of climate change mitigation. Moreover, other global priorities such as the Sustainable Development Goals (SDGs) are also meant to be achieved at the end of this decade. Achieving both these goals, in addition to addressing other crises such as the biodiversity crisis, will require a great degree of coordination as well as the mobilization of huge quantities of resources.

The way we generate and consume energy has not only environmental and climate implications, but it is also strongly connected with social, economic, and political outcomes—for example, SDG7 is key to achieving many other SDGs. Meeting basic energy needs and achieving energy security can address other issues such as clean cooking, job creation, economic development, and emissions reduction. The energy transition involves synergies between the different SDGs (and by extension, between various socio-economic priorities). Achieving these parallel goals will require a large shift in our energy systems, and therefore the way citizens and communities plan and behave in relation to it.

People and their needs should be placed at the center of a sustainable energy system, in line with principles of justice and equity. Energy justice

addresses the equitable distribution of energy resources and the societal impacts of the development of energy solutions, such as the zero-carbon transition or renewable energy initiatives [1]. Therefore, a just and equitable energy transition considers different dimensions: procedural justice (see participation, transparency, access to policymaking), distributional justice (see employment issues, affordability, intergenerational issues, distribution of benefits and costs) and recognition justice (see addressing vulnerable groups) [1].

The importance of taking into consideration energy justice issues and the development of innovative and participatory governance and business models for sustainable energy systems can be highlighted through some surprising numbers—in Sub-Saharan Africa, close to 60% of the population still does not have access to electricity [2]. Moreover, energy affordability is deeply impacted by fluctuating energy prices which can be caused by crises such as pandemics or geopolitical events. Such increases in energy prices is felt by consumers all over the world, hitting vulnerable households particularly hard.

Local and regional governments are critical actors in tackling the climate emergency. Their role becomes more important as we move towards a more decentralized and equitable approach to energy production. They are key to overseeing the on-the-ground implementation of international climate commitments. Their involvement also brings about the possibility for innovative approaches, considering not only the technical transition to renewable energy, but also its social, democratic, and equitable aspects.

Community energy and crowdfunding are examples of community-centric models to govern energy solutions. They drive a just energy transition at the local level by involving local communities and their resources in various capacities, allowing them to become more active participants in their energy systems. Some researchers argue that the sustainable transformation of society and the structural change of regions can only be shaped as a participatory process, as has been the case in the German energy transition [3][4][5]. But participatory processes are often time-consuming and will not in every case support the most efficient or environmentally-friendly option owing to the subjective interests of the participants [6][7].

Regardless, the benefits of community energy and crowdfunding approaches in creating environmental awareness and empowerment due to their transparent, legitimate, and participatory mechanisms is indisputable. Nevertheless, the energy transition is not a homogeneous process, especially considering diverging local contexts, and the definition and conception of community energy projects varies across the Global North and Global South. There is the need to take local specificities into account, and to assess how this concept plays out in different settings, and how community energy projects vary in their main aim, financing methods, and level of citizen empowerment, among others.

Therefore, this knowledge product aims to guide interested local communities and governments. It demonstrates how and to what extent innovative and participatory

governance and business models of communally-owned solutions can boost the local journey towards a sustainable and just energy transition. The paper is structured as follows: first, the concepts of community energy (1) and crowdfunding (2) are unpacked. Next, a comparative analysis of case studies is conducted to showcase the main differences between community energy projects in the Global North and Global South (3). Finally, this paper offers some key takeaways and learnings from this analysis (4).

UNPACKING COMMUNITY ENERGY CONCEPTS

The International Renewable Energy Agency (IRENA) Coalition for Action defines community energy as *“the economic and operational participation and/or ownership by citizens or members of a defined community in a renewable energy project”* [8]. As an innovative governance model, community energy can help address issues such as the financing gap, energy prices, and the public acceptance of renewable energy projects. Citizen involvement and empowerment is central to the community energy concept and to the making of a just, inclusive, and equitable transition at the local level.

Yet, the definition of community energy and the forms that it takes are still varied and are thus better defined by a set of criteria. According to IRENA, community energy projects, either big- or small-scale, must be characterized by at least two of these elements:

- 1) Local stakeholders own the majority of or the entire renewable energy project

2) The voting control rests with a community-based organization.

3) The majority of social and economic benefits are distributed locally [8].

These criteria guarantee that 'community energy' involves participatory governance, linking it to the concept of distributional justice [1], as the project's responsibilities, costs, and benefits are shared between local stakeholders. The term "energy communities" was introduced into European Union (EU) legislation by the "Clean Energy for All Europeans" package adopted in 2019. Ongoing projects at the local and regional level in Europe show how community energy projects can lead to a new conception of energy consumers as "prosumers" and "energy citizens" ¹.

Benefits of community energy

In comparison to large-scale energy projects, community energy projects do not involve technological solutions in an isolated manner. They touch upon a wide array of issues and solutions across the environmental, economic, and social spheres. The following section provides illustrative examples of climate and environmental, social and democratic, and economic benefits of community energy.

Climate and environmental benefits

- Renewable-energy projects implemented through a community energy approach can be a cornerstone of a local or regional government's energy and

emissions reduction strategies while ensuring a just and locally adapted transition.

- Half of the citizens of the EU could be producing their electricity by 2050, which would meet 45% of the EU's energy needs and thus drastically reduce carbon emissions by replacing fossil fuel-derived energy [9]. In Germany, 42% of the renewable electricity generated in 2016 already came from projects conducted by citizens or with strong public participation [9].
- Through improved community feedback and targeting, renewable energy community projects can also help tackle other local environmental challenges, such as reducing indoor air pollution when replacing traditional lighting or cooking fuels.

Social and democratic benefits

- Community energy approaches can offer tailored solutions to communities, ensuring that projects are embedded in the local context and communities are empowered through knowledge transfer and improved access to clean energy [9].
- Particularly in the Global South, community energy projects complement existing energy access initiatives and ensure more affordable and reliable energy access to remote communities [10][11], including through innovative business models and technologies [12].
- Community energy approaches restructure the traditional top-down organization of energy systems and leads to more democratic decision-making by engaging citizens actively in the process [13]. This reorganization

¹ Some projects include EC2 (Energy Citizenship and Energy Communities for a Clean-Energy Transition) and PROSEU (Prosumers for the Energy Union).

can be the vehicle for more inclusiveness as well as gender and youth equity [14].

- Community energy approaches can help attract private investment or even complement it by helping bridge the gap to make projects

viable or bankable. They can also help develop local skills or a value chain to support such projects, which can be particularly valuable for communities that have historically been dependent on a fossil-fuel value chain.

BOX 1: SOSAI RENEWABLE ENERGY – NIGERIA (SEE ANNEX II)



Source: Sosai Renewable Energies [14]

The project, initiated by the private company Sosai Renewable Energies, installed two 10 kW solar mini-grids in the Baawa and Kadabo communities in Kaduna, Nigeria. It was co-constructed with the communities, and its main aim involved access to reliable and clean energy. The citizens also mentioned their struggles with harvest losses and expressed their need for a solar-powered dryer to dry tomatoes and peppers, which were then installed. The citizens helped with the construction. This project led to various benefits, such as job creation, empowerment of women, and clean energy access for rural communities.

This community energy project is a good example of just approach to the energy transition, taking into account the synergies between the different SDGs, and the role that local private actors and other partners can play in it.

Economic benefits

- Community energy projects lead to economic benefits that are redistributed locally: community-led solar and wind projects have shown that they generate 2 to 8 times more local income than projects realized by actors outside of the community [9]. Indeed, they lead to the creation of jobs,

training opportunities, revenue, and broaden access to electricity and eventually foster local socio-economic development [8].

- Community-owned energy projects are more likely to employ and re-invest locally, leading to increased overall community resilience [15]. Such approaches are therefore well-suited to cities and regions that are undergoing other changes

such as shifting away from fossil fuel mining, as they can involve local communities in the re-definition of their community's purpose and collective future. As

capacity building and employment are major considerations in enabling a just energy transition, community energy projects are offering an innovative answer.

**BOX 2: WINDFANG FRAUENERGIEGENOSSENSCHAFT E.V.
— GERMANY (ANNEX II)**



Source: Members of the Windfang e.V. Cooperative, 2011 (Genossenschaften.de)

The Windfang Community Energy project was initiated by women who wished to advance the transition to renewables in Germany, in a sector where women tend to be underrepresented. They founded a cooperative with a governance model that aimed to be as democratic as possible. Only women could be shareholders, and could purchase one or more cooperative shares of EUR 1,500 each. Since 1995, Windfang e.G. developed various projects in Germany, leading to the installation of six wind turbines that generated around 23,040 MWh per year, as well as solar PV projects.

This community energy project is a good example of how a bottom-up, grassroots initiative can drive the energy transition at the local level and organize itself in a democratic way, accessing finance through equity-based crowdfunding and public grants.

CROWDFUNDING: AN INNOVATIVE FINANCIAL MECHANISM

The goal of enabling a just, equitable, and inclusive energy transition implies huge investments in renewable energy technologies and adapted policymaking at local, regional, national, and international levels to create favorable conditions. Addressing the financing gap is central to driving this transition forward. Indeed, it may be difficult for community energy projects to access third-party finance, especially for those that require early-stage support [16][17]. This can be worsened by a lack of technical capacity and relevant climate project expertise. However, some innovative financing mechanisms can complement the spread of community energy.

“Crowdfunding is an internet-enabled way for businesses or other organizations to raise money—typically from about USD 1,000 to USD 1 million—in the form of either donations or investments from multiple individuals. [...] In less than a decade, crowdfunding has spread across the developed world, and is now attracting considerable interest in the developing world as well” [36]. Around the world, crowdfunding campaigns are currently rising over USD 34 billion a year [37].

At the local level, crowdfunding is, in its philosophy, the most fitting financing mechanism for community energy, since it implies a significant involvement of the communities [18]. It consists of individuals pooling resources for a common project,

either online or through cooperative shares for instance. With the help of social media, crowdfunding platforms have been developing exponentially since the 2007–08 financial crisis, responding to the difficulty faced by small enterprises and initiatives in securing loans/funding with traditional banks [19]. Crowdfunding became an alternative way to finance projects including renewable energy projects. This approach can address the financing gap while fostering more citizen participation and local acceptance of renewable energy projects.

Crowdfunding can also be used strategically to improve access to finance for climate action projects [20]. Private sector investors are central to the development of RE projects, and crowdfunding can be a real asset to make these projects attractive. With favorable regulations and facilitation from local and regional governments, crowdfunding has the power to contribute considerably to the energy transition at the local level [21], both by supporting public finance and fostering citizen participation in public life [22].

Business models and financing possibilities

Crowdfunding has grown very rapidly following the financial crisis of 2007–09, as well as during the Covid crisis [23]. The amount of funds collected through crowdfunding platforms grew by 140% between 2015 and 2018, going from EUR 167 million to EUR 402 million in only 3 years [18]. It is also a part of the transformation of the financial sector towards a more decentralized and democratic approach. Crowdfunding can be conducted online—where it can be

easier to gather money and raise awareness about different projects— or more locally, such as through cooperative shares.

Crowdfunding also has different business models, namely donation— donors i.e. “crowdfunders” do not get anything in return for their donation— or reward-based. In addition, there is lending-based crowdfunding where the crowdfunders are paid back at a fixed or floating interest rate that is more advantageous than what traditional banks usually offer. In equity-based crowdfunding, crowdfunders become shareholders of the project and receive dividends and voting rights. The various business models have different advantages. Altruism and a desire to support local development may be primary

motivations in some crowdfunding, particularly in civic crowdfunding campaigns and to finance small projects. The financial incentive as well as the will to become shareholders of the company are what primarily draws crowdfunders in equity- and lending-based models [19].

Since crowdfunding can typically fund between EUR 50,000 to 3 million [24], it can either be used to finance a small-scale project or cover the upfront investment of bigger projects (e.g. solar farms). Thus, crowdfunding provides an opportunity to bridge the financing gap for a project, as well as to encourage citizen participation and engagement by allowing project founders and funders to get in touch directly with lenders outside of the traditional banking system [20].

BOX 3: “MINES DE SOLEIL” – FRANCE (SEE ANNEX II)



Source: Solar PV on the Church Roof - Loos-en-Gohelle

Mines de Soleil is a cooperative society of collective interest created by the government of Loos-En-Gohelle, France. Its aim is to implement the city’s solar plan, including the installation of solar PV on public roofs. To finance this plan, the city decided to develop an innovative business model, founding a company where the city, 115 citizens, and local businesses are stakeholders. Since 2013, Mines de Soleil has installed 2500 m² of solar panels.

This community energy project is a perfect example of the role local governments can play in fostering citizens’ empowerment and involvement in the energy transition. Its innovative business model also shows how equity-based financing can work with local actors.

Benefits of crowdfunding

Innovative financing approaches enable funding for non-traditional projects that may be less or non-bankable in comparison to common technologies and applications. This means that crowdfunding can enable (co-)funding possibilities for innovative community energy projects. Its benefits will be discussed in the following section.

- Community energy projects will be more attractive to other private investors if they already have up-front investment thanks to crowdfunding. This is especially the case in Sub-Saharan Africa where blended finance can have a big impact. The rate of return can also motivate investors from the private sector since it is higher than in traditional banking systems—usually between 6% to 8% [25].
- Some public sector grants can require matching funds, which can be obtained through crowdfunding campaigns [26].
- Crowdfunding proves that the project is publicly supported, creating trust in other investors and bridging the project development funding gap [27].
- The large number of crowdfunders and the relatively low amount of money invested redistributes risk, leading investors to be less concerned about traditional risk measures such as during the early stages of the project or due to a lack of upfront capital [20].
- The money collected through a crowdfunding campaign can be used in place of traditional bank loans. Moreover, the concern of providing a security/collateral against any senior debt/loan from the bank is also reduced, and higher interest rates from local and national banks can be avoided.
- Small community projects are often overlooked by professional investors, and crowdfunding can help realize them.

BOX 4: CORENA REVOLVING FUND -- AUSTRALIA (ANNEX II)

The Citizens Own Renewable Energy Network Australia is a revolving fund whose aim is to finance community energy projects. This crowdfunding platform is donation-based and has shown remarkable success since its creation in 2013. It has since expanded to fossil gas replacement and electric mobility projects.

Crowdfunders donate their money to CORENA, which then provides zero-interest loans for citizen-led energy projects. These initiatives then pay CORENA back with the energy savings, and the money is invested again into other projects. Crowdfunders can either chose a specific project that they want to contribute to or simply donate their money to the pool.

To showcase the impact of their work, CORENA calculated that AUD 100 invested in the Tulgeen Solar Project in 2013 represented AUD 412.20 in project investment in 2021 [27][35].

ANALYSIS OF COMMUNITY ENERGY PROJECTS

The potential of the innovative financing mechanisms of community energy and crowdfunding were explored in the previous chapters. However, the definition, conception, and implementation of (crowdfunded) community energy projects can differ majorly depending on the local and national contexts.

This chapter will explore the different understandings of community energy in Global North and Global South using a comparative methodological approach of case studies.

First, the theoretical approach of Sherry Arnstein's Ladder of participation (1969) is presented, which allows one to assess the degree of citizens' participation in community energy project development. This is further operationalized by different indicators to develop a robust analysis. In a second part, the main outcomes of the comparative analysis are discussed.

Methodology

This comparative analysis of 17 community energy case studies was made through a systematic review of academic papers, grey literature, online workshops, and community energy projects websites (IRENA, ICLEI Europe, EUCENA) to produce a review matrix aiming at determining the differences between community energy projects across the Global North (11 projects) and the Global South (6 projects).

A method to assess citizen empowerment in project development

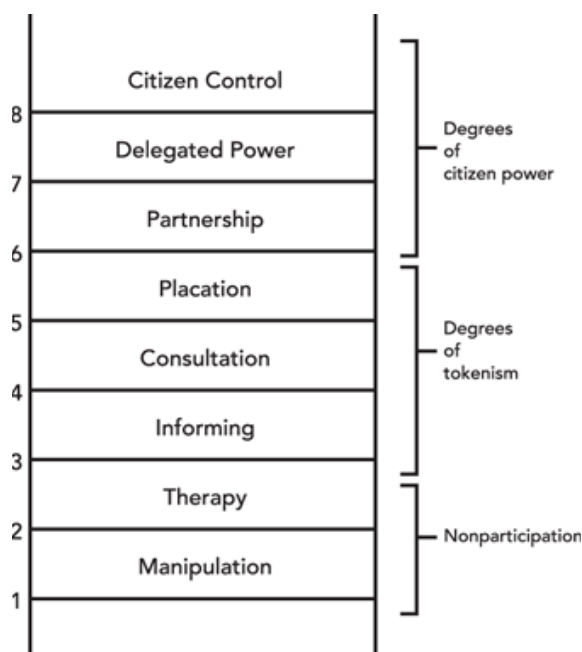


Figure 1: The Arnstein Ladder of Participation, 1969

Citizen empowerment is central to achieving a just and equitable transition. It is also at the core of the community energy concept, and inherent to citizen participation. To assess the degree of citizen empowerment in the analysis of different community energy case studies, the Arnstein Ladder of Participation was used. This typology was developed by Sherry Arnstein in 1969, who observed different citizen participation projects implemented by municipalities. She then developed eight 'rungs' of citizens' participation, from manipulation to complete citizen control.

The Arnstein Ladder of Participation is quite valuable in the classification of community energy projects. Although it alludes to municipal political power and poor communities in an urban setting (which is not the case for all the community energy projects studied),

the scale itself remains insightful for the understanding of the case studies. It helps identify the place that citizens are given in the ecological transition. Arnstein acknowledges limits to her typology, which is inevitably reductive. There may be more rungs of participation that could overlap. Moreover, power holders and “have-nots” are not homogeneous blocks. Finally, the other structural hurdles

to participation, such as patriarchal systems, structural racism, and a lack of political and economic capacity due to systemic obstacles, are not addressed in her typology. The three big stages of the ladder are further explained below in Box 5 as they are crucial to estimate the degree of participatory governance and citizen involvement in community energy projects.

BOX 5: THE STEPS OF THE ARNSTEIN LADDER OF PARTICIPATION

Non-Participation : Manipulation (1) and Therapy (2)

These two first rungs describe a citizens’ participation program that is effectively a substitute for genuine participation and whose goal is to “educate” or “cure” citizens but makes no attempt to redistribute power. Citizens have no legitimate power or access to technical assistance and relevant information. City officials would, during the meeting, educate and advise inhabitants in an asymmetrical way, without listening to their concerns and ideas.

Degrees of Tokenism : Informing (3), Consultation (4) and Placation (5)

These three rungs describe programs that allow citizens to hear and be heard, while not guaranteeing that their ideas will be considered. In these processes, citizens have no direct power of action. Information is an important first step but is not worth much if it is not paired with responsibilities and acting capacities, especially if it is top-down. Placation is a higher level of tokenism, for citizens give advice and insights for the plans but the final decision remains in the hands of the power-holders.

Degrees of Citizen Power: Partnership (6), Delegated Power (7) and Citizen Control (8)

According to Arnstein, a partnership forms when citizens can directly negotiate and trade with power-holders while enjoying shared responsibilities. In the ‘Delegated Power’ situation, they hold most of the decision-making power, for instance through the creation of a citizens’ cooperative or through the issuing of subcontracts with citizens. Finally, ‘Citizen Control’ is achieved only when citizens obtain full managerial power, with no intermediaries between them and the source of funding.

Relevant indicators identified for the review matrix

The following 8 indicators were identified (Annex I). They reflect the different dimensions of a just energy transition [1] and assess participatory governance, especially in terms of citizen empowerment, financing, and

local development benefits, and the interconnectivity between them².

² The sample is not representative of all community energy projects globally. All 17 case studies were successful projects and brought real benefits to the communities, which is likely why they were selected for further study. The results will be contrasted with other studies to try to more accurately depict the gaps between the Global North and Global South.

BOX 6: THE STEPS OF THE ARNSTEIN LADDER OF PARTICIPATION

- **Aim of the project:** Electricity access (EA); Knowledge transfer (KT); Renewable energy production (RE)
- **Technology**
- **Actors involved:** National government (NG); Local government (LG); Citizens (CIT); Local NGO or association (LNGO/A); Local private Actor (LPA); International NGO or association (INGO/A); International private actor (IPA); Distribution utility (DU)
- **Empowerment (using the Arnstein Ladder of Participation):**
 - ▶ **Origin of the project:** Bottom-up, top-down
 - ▶ In order to be bottom-up, it has to be initiated and implemented directly by citizens
- **Financing:** Crowdfunding (CD); PPA; Government grants (GG); International grants (IG); Loan; Equity Financing
- **Governance model:** Cooperative, company

Main outcomes of the comparative analysis

The following section analyses the participatory governance of community energy projects across Global North and Global South in a comparative approach of 17 projects. It takes into consideration the 8 indicators identified in the previous section and puts it into a table of 6 main categories. The main outcomes can be found below.

Aim of the project

The difference between the aim of the community energy projects in the Global North and in the Global South is quite equivocal:

- All of the 11 community energy projects in the Global North have the stated purpose of

operationalizing the transition to renewable energy at the local level, with the main aim being the reduction of GHG emissions.

- In the Global South, the primary goal of community energy projects has been to ensure electrification of rural areas and access to clean energy. Access to energy can be described as the “heart of human development” [28] and is crucial for improving livelihoods and ensuring economic development.

The different aims such projects in the Global North and South is thus telling of the differences in local contexts. The projects strive to address SDG7, its realization being central to the fulfillment of other SDGs on health, education, etc. For example, the AfrikaSTARK 1 project in Mali focuses on solar-powered

irrigation, while the SOSAI Renewable Energy aims at establishing a reliable source of electricity for clean cooking with a focus on empowering women through active participation and skill development.

Technology

Solar PV is overwhelmingly represented in the renewable energy technologies implemented during these projects:

- 14 out of 17 of the case studies developed only or partly solar pV installations. In the Global South case studies, it has been shown to be especially adapted to individual household-level systems for off-grid electricity access.
- Small-scale hydropower was represented in four projects, 2 in the Global North and 2 in the Global South.
- Wind power was only implemented in 3 of the Global North projects.

Solar energy is attractive for community energy. It is a resource that is available everywhere and that can have multiple applications, such as water heating and pumping, lighting, electricity, etc. Solar PV is a modular technology that can be easily scaled up or down. Its easy installation and operation maintenance facilitates the development of this technology, making it highly replicable. Finally, solar power is now the cheapest electricity in history, its price having decreased by 85% in 10 years [14].

Actors involved

There is once again a clear distinction

between the actors involved in projects in the initiation phase and then during operations in Global North and South:

- In 9 of the 11 Global North projects, citizens were part of the initiation. Other actors involved included local businesses (3 projects) and the local government (2 projects). In all, 5 of the 11 projects are entirely initiated, developed, and monitored by citizens. The local and national governments (through grants) appear mainly as facilitators.
- In the Global South, none of the projects in the review matrix were initiated by citizens alone, except for the Tulila Hydroelectric Plant. They were mostly initiated by local private actors (4) and/or local and international NGOs. National governments also initiated 2 of the projects. However, all projects were carried out in the interest of the citizens, who were in most cases integrated along the way.

This underrepresentation of citizens as initiators of community energy projects could point to a gap in capacity, resources, knowledge, or enabling frameworks. Pre-existing knowledge and skills are recognized as a precondition for the success of such projects [29]. There is thus the need for knowledge exchange and capacity-building, not just for individual projects, but in a more systemic manner. This knowledge-exchange can be fostered by supportive policy frameworks and awareness raising at the local level, as well as partnerships with other relevant stakeholders.

Implications for empowerment

The actors that initiated the project

also affect the degree of empowerment. This initiation can be in a top-down (third party) or bottom-up (directly from the citizens) manner:

- In the Global North, 8 out of 11 projects are bottom-up projects and achieve a level of empowerment of 8 on the Arnstein Ladder of Participation, which implies total citizen control of the project. The three remaining projects were initiated in a top-down approach and reach a lower rung of the Arnstein Ladder, namely 7 (Mines de soleil) and 5 (Enercoop ; Hotoku Energy).
- Despite their high degree of empowerment, only 3 out of 11 of the projects focus precisely on underprivileged groups, versus 2 out of 3 of the projects in the Global South that focused on women and youth.
- Although all the projects except one in the Global South are from a top-down approach, citizens are still integrated into almost all stages of the program. Three of these projects are at the 6th rung of the Arnstein Ladder i.e. in an active partnership.

The development of community energy projects in the Global North is more centered around citizens' participation than in the Global South. Indeed, it is often the actors that initiate the project that determine the degree of empowerment. Even if the local specificities and the voices of the citizens seem to have been considered in the Global South cases, a top-down approach usually implies a lack of meaningful participatory

decision-making and fails to capture local needs [30]. There is scope for improvement, where increasing citizen empowerment (through knowledge, skills, resources, etc.) can lead to a more participatory transition that is co-constructed with citizens. In any case, adapting to local needs and the dimension of 'recognition justice' play a stronger role in the Global South projects, as vulnerable groups are specifically targeted for involvement. As mentioned above, knowledge-exchange and capacity-building are key, and local and regional governments should develop policies to foster them.

Implications for financing

The difference is also telling on the financial side of the projects:

- In the Global North projects, 7 projects were financed (sometimes entirely) through crowdfunding (either equity shares, donations, or loans from members of the cooperative). Some of the projects were complemented by national and European grants, and in two cases by loans by private banks.
- In the case of the Global South, crowdfunding was only used in the Tulila Hydroelectric Plant. The rest of the projects were financed through international grants or loans from development agencies and energy cooperatives (4) or national grants (2), as well as by private actors (2).

This shows how vulnerable communities may often lack the resources to undertake these projects, hence the need for financial actors (public, private; national, international) to be involved and make these projects viable. Local and regional governments

have a role to play by creating the right conditions for community energy projects to access public and private funding.

To appeal to private investors, LRGs can guarantee community energy projects or reduce the overall risk by covering the upfront investment for instance. Such support measures can also help such projects access grant funding. LRGs can also purchase electricity produced by community energy projects, facilitate the issuing of permits and licenses, and even provide fiscal incentives such as tax-cuts. They can also frame public tenders and establish portfolio standards in a way that gives advantages to community energy projects.

Finally, they can organize a participatory budget with citizens and create a favorable framework for the development of alternative sources of financing such as crowdfunding, such as by partnering with existing platforms, leading to increased transparency and trust. LRGs must also ensure long-term engagement in order to build capacity at the local level and to prove to investors that community energy projects are viable.

Benefits

In the Global North:

- 10 out of 11 projects mention the reduction of GHG emissions as an achieved benefit, corresponding to the original aim.
- Local investment is mentioned in almost all the case studies, as well as technical training and job creation.
- 2 projects mention the reduction in energy costs as a benefit.

■ These benefits prove how community energy projects in the Global North can help facilitate the fossil fuel phase-out while keeping the economic interests of the community in mind.

In the Global South:

- On top of clean energy access, the improvement of living conditions is mentioned in 5 of the 6 projects.
- The creation of jobs and technical training of the citizens at the local level is also mentioned in a majority of the projects.
- Finally, there are two specific mentions of local investment, especially in local businesses. However, it can also be said that the creation of jobs, training, electricity access and the resulting empowerment of citizens has led to economic benefits in all of the communities.
- The benefits obtained through these community energy projects illustrates how this new mode of governance for energy projects can be deployed in locally-adapted ways, serving multiple cross-cutting aims.

Overall, this analysis shows the potential of participatory governance through community energy projects in addressing the energy transition in a just and equitable manner. At the same time, its outcomes underline the different priorities guiding Global North and Global South projects, and their different conceptions of 'energy justice'. Different local contexts, baselines, and associated needs lead to different priorities within a just transition. Whereas projects in the

Global North enable citizen empowerment through the angle of procedural justice, recognition justice is more central in Global South projects. Addressing women and youth as priority targets groups is key here. Lastly, distributional justice is observed in both Global North and South projects, as employment issues and the distribution of benefits and costs are also given a lot of significance.

SYNTHESIS AND FUTURE PROSPECTS

This final chapter provides some key takeaways. Embracing citizens in co-designing the local sustainable energy transition can help address its socio-economic dimension in a context-specific manner. How exactly can LRGs promote community energy and crowdfunding approaches? The following is a non-exhaustive list and can be seen as a starting point to reflect upon and to adapt to specific local contexts.

- Include elements of procedural justice (enable stakeholder participation, access and transparency of the decision-making processes), recognition justice (e.g. address vulnerable groups), and distributional justice (consider the distribution of costs and benefits of the transition, e.g. employment issues, affordability, etc.) into the design of community energy projects and the governance of the local sustainable energy transition to make it just and equitable.
- Become co-owners and/or invest in decentralized, innovative, and community-based renewable energy projects. Contributing to the development of alternative business

models through public investment can leverage an LRG's credibility and encourage further investments from citizens, stakeholders, and external investors. A good step can be to dedicate specific budget lines to the financing of community energy projects.

- Develop an enabling policy framework, promote, and incentivize community energy projects. For instance, facilitate the permits and licenses for community energy projects and frame public tenders and auctions in a way that gives them an advantage. Additionally, collaboration with public distribution utilities and the adjustment of support mechanisms e.g. feed-in-tariffs to the needs of small-scale community projects can be critical for their development³.
- Assist in knowledge sharing, such as by establishing community energy authorities [8]. These authorities or information centers can facilitate citizen engagement by providing advisory services on project development, as well as providing information on trustworthy crowdfunding platforms and other related opportunities. This can increase public awareness, trust, and confidence, and boost community energy investment. Such a center was established under the ManzaEnergía project in Spain [31]. Moreover, the authorities can link pioneers to new entrants to create a peer-to-peer learning network and knowledge sharing.

³ This recommendation applies to national, regional, and local governments depending on their competencies and authorities in electricity grid regulation.

ANNEX I: REVIEW MATRIX

POWER TO THE PEOPLE: COMMUNITY ENERGY AND CROWDFUNDING

Case study	Area	Origin/initiation of the project	Main Aim	Actors at the origin	Actors involved	Empowerment level	Governance Model	Financing	Technology	Focus on underprivileged groups	Benefits for the Community
3NE Solar Farm - Canada	GN	Bottom-Up	RE	CIT	CIT; DU; NG; LG; LPA; NG; LG; CIT	3 (B)	Company	PPA; GG; Fees	Solar	YES	T; J; GHG
Africasolar1 - Mali	GS	Top-Down	EA	LG	NGO/A; LG	3 (B)	Cooperative	Loan from I.E.; LPA	Solar	YES	T; J; EA; BLT; U
Enercoop - France	GN	Top-Down	RE	NGO/A	NGO/A; CIT; LG; LPA	2; 3	Cooperative	Private Loan	Solar; Wind; Hydropower; Biomass	NO	T; GHG; IEC
Hooku Energy and Solar Power - Japan	GN	Top-Down	RE	LPA; LG	LPA; LG	2	Company	Equity Financing/C rowdfunding g; GG; Fees	Solar	NO	GHG; U
Son Energia - Spain	GN	Bottom-Up	RE	CIT; LPA	CIT; LPA	3 (B)	Cooperative	Equity Financing/C rowdfunding g; Private	Solar; Biogas; Hydropower	YES	GHG; U
Sosai Renewable Energies - Nigeria	GS	Top-Down	EA	LPA; DU	LPA; DU; CIT	3 (B)	Company	Cooperative Loan; Fees	Solar	YES	U; BLT; T; EA
Tulla Hydroelectric Plant - Tanzania	GS	Bottom-Up	EA	NGO/A; LPA	NGO/A; LPA; NG	3 (B)	Company	Equity Financing/C rowdfunding g; Loans from	Hydropower	YES	EA; GHG; BLT; T; J
Ustrom eG - Germany	GN	Bottom-Up	RE	CIT	CIT	3 (B)	Cooperative	Equity Financing/C rowdfunding g; Loans from	Solar	NO	T; BLT; U; GHG
Village Lighting Scheme - Timor-Leste	GS	Top-Down	EA	NGO/A; NG	NGO/A; NG; CIT	3 (B)	Local cooperative	IG; NG; Fees	Solar	NO	T; BLT; U; GHG
Waterpower station Beayokkande & Duvvaza - Suriname	GS	Top-Down	EA	LPA	NGO/A; LPA; NG	2 (S)	Company	IG; Funds Loans from members; Equity Financing/C rowdfunding	Hydropower	NO	EA; J
Bürgerenergiegenossenschaft BEVG eG - Germany	GN	Bottom-Up	RE	CIT	CIT	3 (B)	Cooperative	Equity Financing/C rowdfunding	Solar	NO	GHG; U
BürgerEnergieGenossenschaft KEAICHGAL eG - Germany	GN	Bottom-Up	RE	CIT	CIT	3 (B)	Cooperative	Equity Financing/C rowdfunding	Solar; Wind	NO	GHG; U
Windfang eG - Germany	GN	Bottom-Up	RE	CIT	CIT	3 (B)	Cooperative	Equity Financing/C rowdfunding	Wind	YES	GHG; T; J; U
Solar PowerSelf - Germany	GN	Bottom-Up	RE	CIT	CIT	3 (B)	Association	Private Investments NG; Bank Loan; Equity Financing/C rowdfunding	Solar	NO	T; GHG
SAS Mines de Soleil - France	GN	Top-Down	RE	LG	LG; CIT; LPA	3 (7)	Company	Equity Financing/C rowdfunding	Solar	NO	U; T
MYOPA - SSA	GS	Top-Down	EA	LPA	LPA		Company	Own funds; Fees	Solar	YES	EA; GHG; BLT
Solar Green Point Caballero Factory - The Hague	GN	Bottom-Up	RE	CIT; LPA; DU	CIT; LPA; DU; CIT; PA; DU; B		Cooperative	Equity Financing/C rowdfunding	Solar	NO	GHG; IEC; U

ANNEX II: CASE STUDIES

1. Community Energy in the Global South – Sosai Renewable Energies – Nigeria [14]

Sosai Renewable Energies is a renewable energy provider and consulting company, working on issues related to poverty in rural communities in terms of access to clean energy and water, focusing especially on clean cooking, lighting, and addressing issues of indoor air pollution.

The mini-grids project implemented in the Makarfi local government area in Kaduna, Nigeria shows a willingness to better livelihoods and empower women. The interest in accessing electricity was directly expressed by the members of the communities, and the project was co-constructed with them. Sosai Renewable Energies engaged with the different groups in the community (elders, youth, women, farmers) to determine their needs and gain their support in this project. For instance, farmers who suffered harvest losses due to an inefficient drying system decided to purchase a solar-powered dryer to dry their tomatoes and peppers.

Financed in part by the USADF Off-Grid Energy Challenge grant (USD 100,000) and by a loan from the Dutch Good Growth Fund (USD 25,000), two 10-kW mini-grids were installed in the Baawa and Kadabo communities in 2017. The members of the communities took part in the implementation process by offering land for the construction of the mini-grids and volunteered their time. After the installation, consumers began to purchase electricity through a pay-as-you-go (PAYG) model, which amounted to USD 7 and USD 15 per month for inhabitants and local businesses respectively. In 2021, the two mini-grids supplied 79 households and 12 businesses with electricity, boosting local economic activity.

This project, beyond increasing clean energy access to rural communities, led to other benefits such as job creation, where local staff were hired to monitor the mini-grids and collect payments. Trainings, better agricultural yields, and income for women who oversee the dryers, also created more stable incomes for households and more financial autonomy for women.

The Sosai Renewable Energies projects in the Baawa and Kadabo communities are a good example of renewable energy projects that operate in a just way and address the synergies between the different SDGs, creating more empowered and better-off communities.

2. Community Energy in the Global North – Windfang FrauenEnergieGenossenschaft e.V. – Germany

The Community Energy project Windfang e.V. is also a good example of how a just energy transition can act for gender equality [32][33][34]. In 1991, women interested by the idea of founding a women-led energy cooperative gathered with the aim to advance the energy transition in Germany while creating a place for women in the field of renewable energy. The first concrete idea was to implement a wind turbine in Dithmarschen. It took four years to establish the structure of the cooperative and put their first project in place. After two years of “learning by doing” (most of the women at the time were still students or not trained in the field), their first 450 kW wind turbine was set up in 1995.

They financed this first project partly through subsidies from the regional and the national governments as well as by members’ shares—160 women having invested 750,000 Deutsche Mark. At the time, the members of the cooperative came mostly from the technical field but there were also women from more social fields, working or stay-at-home, which showed the diversity of members of the community interested in taking part.

Since 1995, Windfang e.G. developed various projects in Germany, leading to the creation of six wind turbines making 23,040 MWh per year, as well as solar PV projects. The cooperative is currently operating on a budget of EUR 3 million.

The organization of this community energy cooperative is thought to be as democratic as possible and respects the cooperative principles of “one member, one vote”. To be member of the cooperative, women have to purchase one or more cooperative shares of EUR 1,500 each. It is a way for them to obtain voting rights in the general assembly held each year, as well as to invest their money in the energy transition while knowing where it is going. Each year, a general assembly takes place to decide on projects that will be realized during the coming year and fundamental corporate decisions are voted on. The cooperative is also composed of a supervisory board and a board of directors.

3. Donation-based Crowdfunding – CORENA : “Small amounts of money from LOTS of people can achieve much more than any of us can alone.” – Australia

The Citizens Own Renewable Energy Network Australia (CORENA) revolving fund was initiated in 2013 by Margaret Hender, a citizen concerned about the success of Australia’s transition to renewable energy and frustrated by the lack of governmental action on the matter [14][35]. When she realized that others around her felt the same way, she decided to find a way to pool citizens’ contributions and founded CORENA as a revolving fund. Its main goal is to collectively fund projects from engaged citizens that aim at reducing GHG emissions, locally and globally.

This crowdfunding platform was operated by volunteers at first, but is now an incorporated non-profit association with tax-deductible donation status. Setting up CORENA as donation-based was less complicated on the administrative and legal sides, and eventually worked out as citizens eager to contribute to the energy transition weren’t necessarily interested by a return on investment, but rather by making contributing to the global energy transition.

Between 2013 and 2021, the multiplier effect of its model allowed CORENA to fund 44 solar PV and energy efficiency projects all over Australia, leading to 773 kW and 2441 MWh in energy savings [14]. It has now expanded to funding fossil gas replacement and electric vehicle projects [35]. The case of CORENA is a good example of how donation-based crowdfunding can thrive and expand in the form of a revolving fund.

4. Equity-based Crowdfunding – Cooperative Company “Mines de Soleil” – France (Interview Lucas Nyszak)

The cooperative society of collective interest (SCIC) “Mines de Soleil” was created in a pilot town of the ecological transition—Loos-En-Gohelle. The need for a socio-economic transition in this 6,000-inhabitant city in the North of France became critical in the 1980s, when its mining activity had to stop amid the broader context of mass deindustrialization in France. The demise of the mining industry led to an increase in unemployment and poverty.

The city decided to bet on local heritage, culture, and knowledge to reclaim its citizens’ authority and overcome their disorientation. In addition to the socio-economic crisis, the city had to face huge environmental issues: rivers had reversed or dried up in some places, water supplies had been damaged by mining activities, the ground had sunk by 15 meters due to mine subsidence, and wastelands comprised one fifth of municipal territory. Consequently, the city took a socio-ecological redevelopment approach, betting on active citizen participation. It is now at the forefront of sustainable development, ecology, and energy transition and its current projects involve biodiversity, the agricultural transition, mobility, and food security.

It is in this context that the cooperative company « Mines de Soleil » was created. It all started in 2013, with the renovation of the village church. The city had the idea to cover its roof with solar PV panels. The broader European context was very favorable towards green energy projects, and around 80% of the EUR 50,000 needed for the project were covered by European funds. After this success, the city decided to implement a new “Solar Plan”. To do so, Loos-En-Gohelle developed alternative ways of financing. They developed a new business model for a cooperative company in the form of a special purpose vehicle (SPV) where the city, the citizens, and local businesses were shareholders, each share amounting to EUR 50. The city, companies, and around 115 citizens are now shareholders in the company Mines de Soleil. The first eight solar PV installations needed an investment of around EUR 530,000. In the end, 80% of the project was financed by loans and 20% by equity. Mines de Soleil has already installed 2500 m² of solar panels. This innovative scheme allowed the city to undertake an ambitious energy transition project with limited financial resources, while integrating the citizens as part of the process, and creating a collective way forward for its community in the face of drastic changes.

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100% RENEWABLES CITIES & REGIONS ROADMAP

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