PED Manifesto - a collaborative framework for top-down and bottom-up projects

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Abstract. The PED Manifesto (2024) is deeply rooted in the experiences gained from energy transition projects, particularly through the work conducted within the PED-ACT project. It is grounded in the PED Matrix [1], an evaluation framework designed to categorize energy projects. This matrix was developed from insights gathered across existing PED initiatives and was shaped and validated through discussions with international PED experts. The manifesto analyzes how an energy transition project can be successful and sustainable; and is built around five core demands through which stakeholders, decision-makers, and citizens can work towards reaching social consent. These demands are followed by ten actionable recommendations that can immediately be applied and activated by any citizen or stakeholder. However, this paper focuses specifically on the methodology used in developing the manifesto and the five demands. The PED Manifesto is a public document, accessible to all and open to broad support. At the same time, it can serve both as a foundation for the development of specific PED projects, funding calls, policies, and partnerships, and as a guide to understanding how projects should be structured across different dimensions to promote awareness and participation, which we believe are key to enhancing advocacy and long-term impact.

Keywords: Energy transition, PED Manifesto, Social consent

1. Introduction

One of the most pressing challenges of the 21st century is the global transition to sustainable energy systems. As the impacts of climate change become increasingly evident, governments, industries, and communities are under growing pressure to shift from fossil fuel-based energy systems to renewable and low-carbon alternatives. While technological innovation and policy frameworks are critical to this transition, they alone are insufficient to ensure its success. As early as 2001, Kolk [2] had analyzed the oil industry and noticed a shift towards emissions reduction and investment in renewable energy. Today, almost a quarter century later, this shift still lacks effectiveness - making it necessary to continue work on the energy transition. We need to question, perhaps even doubt the self-regulatory power of nations and industries [3,4] and find meaningful methods and structures that allow citizens to demand, regulate, and co-decide such important matters.

Most modern external pressure stems from science and perhaps citizen movements. There is a need for other parameters and the coordination of millions of individual voices so they can become demands from the public and industry. Finding social consent among multiple and contrasting individual and group voices is crucial towards fostering success in citizen-initiatives [5]. The collective acceptance and active participation of communities, as well as stakeholders and public organisations can shape the consenting process and create a framework for implementing energy transition strategies. Without broad-based social consent, even the most technically sound and economically viable energy projects risk facing opposition, delays, or failure, as seen in numerous cases of community resistance to renewable energy infrastructure [6, 7, 8] or fossil fuel phase-outs [9, 10, 11].

A more contemporary approach to fostering sustainable behavior involves the implementation of voluntary initiatives, including environmental programs, certifications, and ecolabels – yet these have to be grounded in a comprehensive structure of evaluation and categorization. This approach was applied for the energy transition projects that utilized the Positive Energy District concept. In the PED-ACT project, we analyzed dozens PED projects across Europe through the utilization of machine learning techniques [1]. The complete study [1] proposes a systematic (and comprehensive) framework to categorize and characterize PEDs, aiming to create a structure that helps assess and understand existing challenges and potential contributions. Voluntary paradigms and regulatory mechanisms are essential steps to move beyond the current the state of the art and industries [12,13]. These initiatives can thus, encourage environmentally responsible practices that impact the direction of market-based mechanisms and collaborative efforts, rather than relying solely on topdown enforcement. Ultimately, this paper calls for a reimagining of energy transition strategies to place social consent at their core, ensuring that the shift to a sustainable energy future is not only technologically and economically viable, but also socially just and inclusive. The output of the social consenting within the PED-ACT project is the PED Manifesto [14]. The PED Manifesto - Turning the balance of local energy into POSITIVE - builds upon the experiences collected in energy transition projects, the PED database [15].and the PED Matrix [1].

The PED Database [15] from the PED-EU-NET project (Positive Energy Districts European Network) is a comprehensive resource that collects and shares information on Positive Energy District (PED) projects across Europe. The PED Matrix [1], an analysis of over 50 European cases (all in different phases of implementation and including cases from the PED Database) defines eight aspects that are crucial for PED projects to ensure their implementation and success. At the core of the Matrix is an approach that asserts the *human factor* as being a critical aspect that is often overlooked or not valued adequately in energy projects [1]. The PED Manifesto [14] can be the social consenting basis for the development of collaborative energy projects, calls, policies, and collaborations on the one hand, and an understanding of how projects need to be developed on the other. In this paper, we would like to provide an overview of how the PED Manifesto [14] was developed and what the document entails. The manifesto in full, is accessible online (open access).

2. Methodology

The concept of social consent goes beyond mere public approval of decisions by decision makers or industries. The consenting process encompasses meaningful engagement, equity, and justice in the energy transition process [16,17,18]. This is particularly critical in addressing the uneven distribution of costs and benefits associated with energy transitions, which often disproportionately impact marginalized or vulnerable populations. Social consenting is not merely a moral imperative but a practical necessity for successful collaboration among different stakeholders in the energy transition. The manifesto [14] can be useful in the participatory governance, equitable resource distribution, and transparent decision-making processes. The risks of neglecting social consent can lead to public backlash, policy stagnation, and the perpetuation of social inequalities.

2.1. The PED Matrix

The PED Matrix is a vital document that provides the manifesto [14] with researchbased conclusions. While many studies have begun addressing the technical, economic, and social aspects of PEDs, very limited study is found on characterizing PEDs [19]. The multi-criteria Matrix fills this void and seeks to characterize Positive Energy Districts (PEDs) in a systemic way, by using machine learning technology and consulting focus groups [1]. Keywords extracted from existing projects were shared with the public, including stakeholders within the DUT framework, PED-ACT partners, and the PED-EDU-NET network, to gather feedback and refine the PED Matrix. The work resulted in the identification of eight critical dimensions, which are key aspects in identifying and characterizing PEDs and relate to smart city risks [20]. Through focus group reflections, the aspects were defined as consisting of **social**, **process, technical, governance, environmental, legal, financial,** and **managerial** components. The Matrix is designed to adapt to the dynamic nature of PEDs [1], incorporating new insights, technologies, and practices as they emerge. This ensures its continued relevance for analyzing and comparing PEDs.

2.2 The process of developing social consent - manifesting

The PED Manifesto [14] serves as a foundational framework for advancing energy transition projects such as Positive Energy Districts (PEDs) through collaborative governance models and multi-stakeholder engagement. Anchored in insights from five European case studies, and the European database of PEDs [15], the manifesto is aligned with the findings of the PED Matrix. The research provides a tangible reference point for implementing energy initiatives in the frameworks of the Cities Mission, the NetZeroCities initiative, Climate City Contracts, and the New European Bauhaus activities. It aims to consolidate the collective vision for energy transition, offering a structured approach to governance that integrates both top-down decision-making and bottom-linked community-driven initiatives. The PED Manifesto evolved through accessing the main sources available up-to 2024 through the PED Database and the PED-ACT case examples, within the European context. This means it can be seen as a

living document, which is evolving through continuous engagement and translation in European languages with new case studies, initiatives, collaborations, and consortia. Future iterations will refine its structure and expand its applicability, ensuring that it remains a pivotal milestone in the ongoing transition towards climate neutrality across Europe and beyond.

2.3. Empowerment in energy transition - the manifesto

The manifesto [14] sees energy transition as a three pillared pathway: economic, ecological, and social sustainability. While the first two are generally placed at the core of energy projects, the aspect of social sustainability is generally weakly developed, creating a need to focus on this essential component. The manifesto builds on the premise that energy transition is a cross-collaboration among various actors [5]. The manifesto recognizes the work and significance of local actors and needs to be utilized in conjunction with local action plans or roadmaps by a variety of actors. It aims to help reinforce and build on the local work, while stimulating a just and inclusive energy discourse. As a result, the manifesto may have local shades and versions as well as updated and adapted versions. Groups/stakeholders of the quadruple helix model are the main target groups of this manifesto. The entities in these groups may differ from context to context. Entities and groups of people have to be identified for each local adaptation of the manifesto in the fields of government/public entities, academic groups or organizations, industry representatives, consultants and companies, as well as citizens, citizen groups and citizen advocates. The PED Manifesto is designed in 3 parts [14]. The first part connects issues and the need for collective actions, while introducing and emphasizing the emergency and urgency of the topic. The second part lays out the crucial content for a successful project and describes the mentioned eight aspects and their impact. The third chapter summarizes the needs related to the energy transition via concrete citizen demands from decision makers. The demands are outlining the principles that describe what is important when engaging in an energy project.

3. Results: PED Manifesto structure

Engagement is a cornerstone of transition projects and lies at the heart of the manifesto. Meaningful participation ensures that all stakeholders contribute effectively toward a shared vision of carbon neutrality. Transparency is key, with engagement tools tailored to different levels of involvement—broad outreach provides clear information to wider audiences, while active participants take part in co-creation efforts. A range of engagement levels ensures that communities are proactively involved, diverse perspectives are respected, and participants understand their roles. Inclusivity is essential, as is allowing all voices to be heard and valued. A diverse mix of backgrounds strengthens the process, and early involvement gives people a chance to shape decisions in a democratic manner, with opportunities for active participation. We felt a majority of the fundamentals related to creating encompassing processes that engage citizens

and ensure a comprehensive approach are summed up in the following categories as core aspects of the manifesto.

3.1 The PED aspects

The social aspect	The technology aspect
The social development of a PED project can ensure its relevance to people. It involves enhancing individuals' assets and capabilities to improve well-being, while aligning with the economic, environmental, and social balance.	Technology plays a vital role in achieving PED goals by optimizing energy generation, distribution, and consumption. PEDs utilize advanced technologies to improve energy efficiency in buildings and infrastructure, including high-performance insulation, energy-efficient HVAC systems, and smart appliances that adjust based on real-time energy data.
The process aspect	The governance aspect
Depending on the size of the area of transition, the readiness of the built environment and the envisioned transition, the process can be lengthy - sometimes requiring extensive expertise, alongside strong commitment from the actors.	An energy project needs to be clear on when to involve whom, how decisions are made and who can step up when challenges emerge. Defining rules of common practice and decision making, the division of power in extra ordinary situations and listing the common values is crucial.
The environment aspect	The legal aspect
A well-functioning environment and healthy ecosystems are crucial for resilience and our futures. Each community might have their own set of crucial and important measures, solutions, and priorities when it comes to the topic of the environment .	
The financial aspect	The managerial aspect
Securing financing is necessary for initial investments to kick-start a PED project, but many stakeholders overlook alternative financing methods, such as sustainable financing or crowdfunding. Additionally, most projects fail to adequately address long-term costs, running expenses, or future investment needs, which are often key concerns for citizens and stakeholders	Expertise on the built environment, systems, energy, material, sustainability, digitalization can prove to be crucial when developing an energy project. Access to such knowhow can help create the right measures to save energy and obtain an understanding of the tools that can create an energy mix that can match local energy needs.

Figure 1 The 8-PED-aspects for the energy project based on the PED Matrix [1]

3.2 The demands of the PED Manifesto

The demands in the manifesto [14] for energy transition begin with a few crucial assumptions: we need to start somewhere to initiate change, 100% renewable energy is already possible, and a holistic approach is necessary for comprehensive and long-lasting transformation. The manifesto aims to bring decision-makers and decision-seekers together to discover a means of reaching social consent on the basics, which parties can further build on. The demands listed in the document in short are as follows:

100% renewable energy

The feasibility of 100% renewable energy is supported by numerous studies. For instance, Jacobson et al. [21] outline detailed roadmaps for 139 countries to transition entirely to renewable energy by 2050, emphasizing economic and environmental benefits.

A price tag on carbon

Governments have the opportunity to provide a fair and equitable transition. Carbon solutions need to be an expensive option among very attractive, sustainable ones. The demand we put forth is to tax carbon heavily while applying incentives and subsidies for renewable energy.

Public spending for the public good

We assert that governments need to use the opportunity to prioritize common good with investments in renewable energy [22] and communities. Public money should be spent solely for public interest and the public good [23].

Energy and Zero Carbon Innovation

Ensuring a climate-safe future needs to guarantee a full energy transition to renewables [24]. By supporting smaller scale initiatives and micro- generation, benefits will be directed to poorer segments of society [25].

Transforming industries

Our linear economic model is directly responsible for the climate breakdown. We need to urgently transition into a circular model [22]. The circular economy model is based on a balance of production and consumption [3] and could be fortifying the energy transition with its principles. [26] This concept perfectly aligns with the principles of local energy production systems [27] such as energy communities and Positive Energy Districts.

Placing climate action at the core of our actions

Instilling justice can bring local actors together and motivate action, while healing the unjust practices of the past [28, 29]. People and communities that have historically contributed the least to greenhouse gas emissions are those suffering first and foremost from the impacts of climate change. A green transition needs to be a just transition.

Figure 2. The 6 demands for energy projects based on the PED Manifesto [14]

4. Conclusion

In the wake of energy transitions, researchers, decision-makers, civil organizations and practitioners face uncertainties in the development and implementation of energy projects. A collaborative approach responds to the challenges by promoting meaningful partnerships in future energy transition projects. In summary, the PED Matrix [1] and the transition scoring system provide a robust, collaborative framework for characterizing PEDs, enabling better analysis, comparison, and implementation of energy projects while remaining adaptable to future developments in the field.

The PED Manifesto [14] was written primarily to strengthen the concept of public involvement. It also promotes empowerment to ensure the public play a part in the solution and have reason to adapt their lifestyles to the co-developed solution. The beneficial and preferred collaboration between producers and consumers is at the core of this solution. We need affordable energy for all, new opportunities for engaged actors, a rethinking of supply chains and policy frameworks, a shift away from wasteful habits, fair pathways and deals, and the empowerment of those committed to greening, maintaining, and repairing our environment. With the PED Manifesto, we emphasize that PED projects must establish a core community responsible for managing and governing the project, including beyond the implementation phase. We also advocate for energy communities to receive support from the PED field, enabling them to transform parts of their community into a PED initiative. A document of this depth and complexity will naturally require further revision, adaptation to local contexts, and translation into multiple languages. In this sense, the PED Manifesto should be understood as a living document. The demands it presents are broad and interconnected, reinforcing the idea that meaningful change must be embraced by society as a whole. Our sincere hope is that the manifesto serves as a tool to help shape and guide practical, inclusive pathways toward the urgently needed energy transition—anchored in values such as transparency, community, and collaboration.

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