

## **DETERMINANTS OF CITIZENS' PARTICIPATION AND INVESTMENT IN ENERGY COMMUNITY INITIATIVES**

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### **1. Introduction**

Transforming societies into sustainable models of production, consumption and prosumption is a key challenge of the current century [1]. In addition to changing behavior at the individual level, transformation at the systemic level through collective action is required to address the challenges of existing energy systems, as collective action has been a historically successful driving force for social transformation [2].

Through Energy Community initiatives, the energy system is transformed from a centrally coordinated fossil fuel-powered system to a bottom-up decentralized low-carbon system [3]. Energy Communities create new roles for citizens and local communities, placing them at the heart of the energy system [4]. Citizens' acceptance, support and participation are essential for the successful management of these ongoing energy transformations [5].

Three key approaches to the analysis of Energy Communities can be identified: micro-level processes, social acceptance and institutional conditions [6]. Regarding the micro-level examination, the relevant work focuses on the factors that can determine the creation and development of Energy Communities [7], the factors that can lead citizens to participate [5] and to invest [8] in such initiatives. Despite the efforts made to describe these initiatives, these processes have not been thoroughly studied. There are a small number of studies (e.g. [9]) that present quantitative empirical data on the intention of citizens to participate and invest in such initiatives, as well as the motives and other factors that can affect their decisions.

The present paper is part of a project focused on the examination of the institution of Energy Communities in Greece, with the aim of innovating in research by examining new research questions regarding Energy Communities at their micro-level. Specifically, the purpose of this project is to investigate the views and behavior of citizens regarding information, participation

and investment in the Energy Communities, as well as to address relevant issues (motives, barriers, incentives, structures, etc.) which have not been explored in the past. In this context, the present work presents the results of the performed literature review, which focused on the identification, organization and assessment of the available findings relevant to the above-mentioned themes.

## **2. Findings**

### **2.1 Identification of motives and barriers**

Different incentives can lead citizens to participate and invest in Energy Communities. Holstenkamp and Kahla [10], identify the following motivations: return on investment, secure energy supply, creation of local added value, protection of the environment, promotion of energy transition, participation in energy production, being a member of a community. The need for autonomy [7], the desire to influence decisions on local energy policies [11] and social rules [12] can be added to the above.

Although there are many benefits associated with citizen participation in Energy Communities, there are also several barriers and challenges [13]. The main barriers against the implementation of "bottom-up" energy initiatives come from the central planning and regulation of existing energy systems that do not always provide a level playing field for local energy systems. Energy Communities can be hindered by technical obstacles such as lack of equipment, know-how and experience [14]. On the other hand, economic barriers may occur, such as high initial investment costs [15], long payback periods and low cost/performance ratio [7]. Another category is government interventions, including bureaucratic hurdles and the absence of long-term and stable policies [7]. Challenges also include funding, operation, community involvement, and fair cost-benefit sharing [16]. Although it is a local initiative, Energy Communities may face resistance from local communities if they do not align with local interests. For example, issues of coordination and split incentives can arise when the costs and benefits of local energy systems do not end up in the same entity [17].

### **2.2 Factors affecting participation and investment in Energy Communities**

Willingness to participate and invest is vital to the success of Energy Communities. In addition to factors related to collective action at the local community level, a number of factors related to citizens' willingness to participate in renewable energy and energy efficiency projects can play an important role [18].

Different demographic and socio-economic factors such as age, marital status, education, occupation, income, home ownership and area of residence can affect citizens' willingness to participate and invest [5,18]. In addition, their willingness is influenced by economic factors such as return on investment [8], the existence of subsidies, tax incentives [19], the price of energy, and the cost of maintaining systems [18]. On the other hand, the socio-institutional factors that can influence the willingness of citizens to participate and invest in Energy Communities include the existing institutional framework, the provision of information, the

ownership status of the scheme, factors related to the adoption of innovations, environmental concerns, community “spirit”, trust, distributional justice, and other social and ethical norms [5,9].

### 3. Discussions and Conclusions

Aim of the present study is to present the literature review that has been performed in the context of a project focusing on the participation and investment determinants of citizens’ participation in Greek Energy Communities. The review presents and discusses the motives, barriers and overall factors that have been found to affect citizens’ participation and investment in Energy Communities. The findings of this work will be utilized for the development of a theoretical model, **aiming at providing a “road map”** that will combine the research hypotheses, theories and factors that have been identified, providing a basis for their in depth examination through a subsequent qualitative and quantitative analysis.

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**Commented [SK1]:** The comment that we received is the following: «The “road map” goal, needs to be further elaborated. What is the value or the practical purpose of the roadmap and which are the target groups or sectors or processes that may use it? ».

**I believe that we have a misunderstanding here, due to the poor choice –from our side- of using the term “road map”.** What we mean here, is that the theoretical model will combine the research hypotheses, the theories and the identified factors, and will be used for our future qualitative and quantitative analysis (and not the creation of a road map aiming at specific target groups etc.)

Thus, we modified our phrasing accordingly.

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