



How does a pioneer community energy project succeed in practice? The case of the Samsø Renewable Energy Island



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ABSTRACT

Community energy projects have been one of the pillars of Denmark's remarkable renewable energy history. The island of Samsø has received worldwide attention as a model community in this regard, having been able to transform large parts of its energy system in a period of 10 years. Much of this attention is focused on the end-results of this transformation, on *what* Samsø has achieved to date, including the technical infrastructure and the fact that the local community participated actively. Little attention has so far been paid to *how* these results were achieved in practice. In this paper, we examine the concrete contextual conditions that made the success of the Samsø Renewable Energy Island project possible. As external contextual conditions, we identify *guiding visions and plans, governmental technology support, governmental process support, and expert assistance*. Internal contextual conditions include *local traditions and history of cooperative projects, sense of locality and responsibility, community spirit, entrepreneurial individuals, networks, as well as guiding visions and plans*. The results clearly show that the success of the REI project can be attributed to the combination of these varied contextual conditions, which in their entirety made the island's transformation possible. However, in order for these favourable contextual conditions to lead to a successful project, it required *alignment through intermediaries* between the external and internal context, as well as internally on Samsø. Most importantly this alignment entailed the integration of the Renewable Energy Island project into the structure and needs of the local community through intensive processes of *sensing and priming* linked to the local population.

1. Introduction

Community energy projects have been one of the pillars of Denmark's remarkable renewable energy history. Local project development and implementation driven by local actors and interests has resulted in a widespread adoption of energy technologies around the country, including wind power, CHP and district heating, biogas and large-scale solar thermal installations. The Renewable Energy Island Samsø exemplifies this in a nutshell, and has received a relatively large amount of international attention in the media, by policy makers and practitioners,¹ often praising it as a good example of a (local) renewable energy transition. The island is, for instance, one of the official showcases presented on the State of Green internet portal – a common platform of the Danish government and main industry organisations

informing the international community about Denmark's plan to achieve a 100% renewable energy system by 2050.² Energiakademiet (the Energy Academy), the island's own information and education centre, receives some 4,000 visitors annually, including schoolchildren, students, business actors, politicians, ambassadors and members of royal families. In addition to that, Energiakademiet is regularly invited to international conferences and workshops and forms an active part of the political debate surrounding renewable energy in Denmark. Since the start of the Renewable Energy Island project in 1997 Samsø had engaged with similar projects elsewhere in Europe and was awarded the ManagEnergy Local Energy Action Award in 2012.³

As such, Samsø is well recognised nationally and internationally as a best practice example of how a community can transform its fossil fuel-based energy system into a renewable energy-based one. The

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¹ See for instance: <http://www.b.dk/klima/samsø-er-berømt-verden-over>
http://www.nytimes.com/2015/01/18/business/energy-environment/green-energy-inspiration-from-samsø-denmark.html?_r=0
<http://www.scientificamerican.com/article/samsø-attempts-100-percent-renewable-power/>
<http://ecowatch.com/2014/05/01/samsø-renewable-energy-island-sustainable-communities/2/>
<http://www.newyorker.com/magazine/2008/07/07/the-island-in-the-wind>
http://content.time.com/time/specials/packages/article/0,28804,1841778_1841782_1841789,00.html.

² <https://stateofgreen.com/en/profiles/samsø-energy-academy>.

³ http://www.managenergy.net/casestudies_actionaward_2012.html#.VmW34HsWHV1.

results of this transformation are well documented in terms of, for instance, the number of wind turbines, district heating plants and solar thermal plants installed on the island along with their annual electricity and heat production and the resulting savings in CO₂ emissions [1]. Even relatively detailed and structured information regarding the technology, economy, organisation and ownership structure behind the various renewable energy projects on Samsø has been made available recently.⁴ An online database called the Energy Institute, which collects books, analyses, reports, newspaper articles, videos and planning documents including minutes of meetings related to the Renewable Energy Island project, has also been set up.⁵ Therefore, detailed information on the design and organisation of the Samsø energy projects with a focus on the end results in terms of the established technical infrastructure is widely available to the public.

However, from a research point of view a number of important questions remain to be explored. For instance, while the success of the Samsø project is sometimes attributed to the fact that “one dedicated local citizen was able to reach out to his community and inspire it to enact local but powerful change”⁶ [2], what was the breeding ground for such individual action to be successful? More specifically, what were the concrete conditions that enabled Samsø to initiate and carry out the Renewable Energy Island project within a timespan of around 10 years, and thus to implement the abovementioned technical infrastructures for a roughly 100% renewable electricity and heat supply, for which it is recognised widely? Moreover, how were the planning processes and communication strategies specifically arranged to foster such a relatively fast implementation of the various renewable energy projects on the island? While internationally Samsø’s recipe for success sometimes is described along the lines of: “cooperative action achieves community goals” [3], how exactly was the local population convinced in practice to not only accept these new developments, but also to actively participate, invest in and own them? While some of these aspects are occasionally hinted at [4–6], researchers and practitioners outside Samsø still lack a systematic understanding of how the specific practical capacities, strategies and types of behaviour that are required to actually plan and carry out a comprehensive community energy project, such as the one on Samsø.

The above questions touch upon issues that cannot easily be compiled and displayed for the public. Yet, as we are going to argue, “soft” topics, such as the political and socio-cultural context, planning processes, communication and local ownership have been the backbone of the Samsø project, and therefore need to be understood in greater detail. The reason for this is also that, unlike the technical infrastructures, the specific planning processes are difficult to replicate or to adapt for use in other communities, unless one understands the context within which the Samsø project has been made possible. Moreover, since one of the pre-requisites for the project was to apply well-proven technology, technological innovation is not necessarily what makes the Samsø project interesting for a wider audience. This paper argues that the Renewable Energy Island project is the result of a number of specific external framework conditions and concrete local contextual conditions on Samsø that were present shortly before and during the implementation of the project.

The main objective of the paper is to unpack and analyse these specific external and internal conditions and to shed some light on how they could be utilised, linked, translated and expanded upon to create successful renewable energy projects and processes on Samsø. In doing so, the paper focuses mainly on understanding the social, cultural and planning aspects of the Samsø project and their links to the local and

national conditions, since these are typically less well understood, even though they are essential ingredients in successful community energy projects [11]. Apart from a brief description of the main components of the Samsø energy system in Section 4, the focus thus is not on analysing the technical energy infrastructure or modelling the energy system to understand various technical and economic outcomes and future potentials of the Renewable Energy Island project, as we feel that these issues typically are more “visible” and better described – especially in the case of Samsø [1,37,42].

In the following section, we construct a theoretical framework for the analysis of the socio-cultural and planning aspects, inspired by the existing community energy literature. In Section 3 we describe the methodology used to analyse the Samsø project as a case. In Section 4 we present a brief overview of the Renewable Island Project, and in Section 5 we present the results of the case study. We discuss the results and conclude the paper in Sections 6 and 7.

2. Understanding the external and internal context of community energy projects

Community energy projects are often embedded in and dependent on wider societal structures and institutional arrangements, which may be grouped under the term *external context*. The success of these projects is also highly dependent on the local context of the communities, within which they are supposed to be implemented. This may be called the *internal context* of community energy projects. Van der Schoor and Scholtens [7] study community initiatives in terms of their outside networks and internal commitment to members, while Seyfang and Haxeltine [51] underline the importance of resolving internal as well as external factors in grassroots innovations. According to de Waal and Stremke [8], ‘renewable energy systems are hardly transferrable to other situations. For every new case the context-dependent potentials and possibilities should be identified’. These contextual factors and their inter-relations [9] should be understood in detail, if we want to make sense of the specific reasons for why community energy projects succeed or fail, as well as for decision makers and local practitioners to be able to design adequate policies and processes that can promote the former and prevent the latter. Fig. 1, illustrates this theoretical starting point for the analysis. The following sections discuss relevant external and internal contextual conditions that can guide the analysis of Samsø’s Renewable Energy Island project.

Especially larger community energy projects are not only often technically interlinked with the national energy system through e.g. grid connection and therefore dependent on its wider institutional arrangements, but their success and failure also depends on specific (non-technical) contextual factors [10,11]. According to Walker [10], such factors can include the entrepreneurial spirit of local individuals and the leading role of partnerships of established local organisations, increasing the likeliness of community benefits and support. At the same time, it is noted that community energy partnerships seem to be somewhat dependent on continuous external support through e.g.



Fig. 1. The success of community energy projects depends on specific external and internal contextual conditions. For instance, to what extent does the external context support community energy projects, and to what extent is the internal community context prepared to act upon and influence the external context in order to implement renewable energy projects? Given that a similar external context applies to many communities, “energy-active” communities must exhibit specific conditions that enable them to utilise a favourable external context. This utilisation of the external context happens through interaction points, which are arenas or inter-relations in which an external conditions is shaped into a concrete local outcome.

⁴ <http://seacourse.dk/wiki/tiki-index.php?page=REE&structure=REE>.

⁵ <http://energiinstitutet.dk/>.

⁶ The local citizen is Søren Hermansen, who was hired by the Samsø Environment and Energy Office to help implement the 10-year Renewable Energy Island Plan. For his and Samsø’s achievements he was named one of the “Heroes of the Environment 2008” by Time Magazine.

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