OPEN LETTER

Lessons learnt during the workshop "Empowerment of citizens: fostering user engagement for innovative demand response for effective flexibility" [version 1; peer review: 3 approved with reservations]

Yeimy Ospina[1], Fabio Maria Aprà[2], Aggeliki Aggeli[3], ROMAN TOMAŽIČ[4], ISMINI DIMITRIADOU[5], PABLO BARRACHINA[6], ARJEN SCHAMHART[7], BREFFNÍ LENNON[8], PAUL TOBIN[9], WILLIAM THRONDSEN[10], Carmen Valor[11], Juan Martino[12]

[1]CLUSTER DIGITAL DE CATALUNYA, BARCELONA, BARCELONA, 08012, Spain
[2]R2M SOLUTION SPAIN SL, MADRID, MADRID, 28032, Spain
[3]Department of the Built Environment, AALBORG UNIVERSITY, Copenhagen, 2450, Denmark
[4]ZPS, Ljubljana, 1000, Slovenia
[5]Hypertech, Halandri, 15232, Greece
[6]MIWenergía,, Espinardo, 30100, Spain
[7]Energie Samen Riverland, Geldermalsen, 4191, The Netherlands
[8]University College Cork, Cork, T12 R229, Ireland
[9]Smart Innovation Norway, Halden, 1783, Norway
[10]Dpt. of Interdisciplinary Studies of Culture, Norwegian University of Science and Technology, Trondheim, 7049, Norway
[11]IIT-Facultad de ciencias económicas y empresariales, Universidad Pontificia, Comillas, 28015, Spain
[12]Soulsight Design Strategy, Madrid, 28001, Spain

v1 **First published:** 04 Jan 2023, **3**:1
https://doi.org/10.12688/openreseurope.15270.1
Latest published: 04 Jan 2023, **3**:1
https://doi.org/10.12688/openreseurope.15270.1

Abstract

This open letter summarises the discussions held during of the workshop "Fostering user engagement for innovative demand response for effective flexibility" celebrated during the 10th edition of the Sustainable Places 2022 conference. This event was organised in a hybrid format in Nice, France, from the 6th September to 9th September 2022, in which the sister projects iFLEX, ACCEPT, HESTIA, SENDER, and ReDREAM participated. This open letter follows the format used by the workshop held in Sustainable places 2022 (SP2022): the questions were asked by the moderator and the answers were given by sister projects' representatives, together summarising the collaborative work performed by the five projects.

Keywords

Energy efficiency, renewable energy, energy transition, empowerment of citizens, citizens engagement, smart homes.

Open Peer Review

Approval Status ? ? ?

	1	2	3
version 1 04 Jan 2023	? view	? view	? view

1. **Jose Villar**, INESC TEC, Institute for Systems and Computer Engineering, Porto, Portugal
2. **Gianluca Carraro**, Universita degli Studi di Padova, Padua, Italy
3. **Jens Lowitzsch**, European University

This article is included in the Horizon 2020 gateway.

This article is included in the Sustainable Places 2022 collection.

Viadrina, Logenstraße, Germany
Lucas Roth, European University Viadrina, Frankfurt an der Oder, Germany

Any reports and responses or comments on the article can be found at the end of the article.

Corresponding author: Fabio Maria Aprà (fabio.apra@r2msolution.com)

Author roles: Ospina Y: Writing – Review & Editing; **Aprà FM**: Writing – Original Draft Preparation; **Aggeli A**: Writing – Original Draft Preparation; **TOMAŽIČ R**: Writing – Original Draft Preparation; **DIMITRIADOU I**: Writing – Original Draft Preparation; **BARRACHINA P**: Writing – Original Draft Preparation; **SCHAMHART A**: Writing – Original Draft Preparation; **LENNON B**: Writing – Original Draft Preparation; **TOBIN P**: Writing – Original Draft Preparation; **THRONDSEN W**: Writing – Original Draft Preparation; **Valor C**: Writing – Original Draft Preparation; **Martino J**: Writing – Original Draft Preparation

Competing interests: No competing interests were disclosed.

Grant information: This research was financially supported by the European Union's Horizon 2020 research and innovation programme under the grant agreement No(s) 957823 (Holistic Demand Response Services for European Residential Communities [HESTIA]); 957670 (Intelligent Assistants for Flexibility Management [iFLEX]); 957781 (Active Communities & Energy Prosumers for the energy Transition [ACCEPT]); 957755 (Sustainable Consumer engagement and demand response [SENDER]) and 957837 (REAL CONSUMER ENGAGEMENT THROUGH A NEW USER-CENTRIC ECOSYSTEM DEVELOPMENT FOR END-USERS'ASSETS IN A MULTI-MARKET SCENARIO [ReDREAM]).
The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

How to cite this article: Ospina Y, Aprà FM, Aggeli A *et al.* **Lessons learnt during the workshop "Empowerment of citizens: fostering user engagement for innovative demand response for effective flexibility" [version 1; peer review: 3 approved with reservations]** Open Research Europe 2023, **3**:1 https://doi.org/10.12688/openreseurope.15270.1

First published: 04 Jan 2023, **3**:1 https://doi.org/10.12688/openreseurope.15270.1

Disclaimer

The views expressed in this article are those of the author(s). Publication in Open Research Europe does not imply endorsement of the European Commission.

Introduction

To facilitate the cross-exchange of knowledge between EU projects, improving the use of lessons learnt and enhancing the improvement of project results, five EU projects on demand-response (DR) and energy communities started to closely collaborate in April 2021. iFLEX (Intelligent Assistants for Flexibility Management), ACCEPT (ACtive Communities & Energy Prosumers for the energy Transition), HESTIA (Holistic dEmand response Services for European residenTIAl communities), SENDER (Sustainable Consumer engagement and demand response), and ReDREAM (REAL CONSUMER ENGAGEMENT THROUGH A NEW USER-CENTRIC ECOSYSTEM DEVELOPMENT FOR END-USERS'ASSETS IN A MULTI-MARKET SCENARIO) were all in their starting phase and their urgent and common challenge was related to the active participation of users in their projects. This open letter follows the format used by the workshop held in SP2022 (Sustainable Places 2022). The questions were asked by the moderator and the answers were given by sister projects' representatives, together summarising the collaborative work performed by the five projects. Because of time restrictions, not all the projects' representatives were able to reply to all the discussed themes, however this open letter represents the main aspects and activities performed that the representatives aimed to share with a wider public as lessons learnt in the pilot sites development. It specially focuses on publicly exchanging information, best practices and challenges identified during the different activities achieved, so that interested stakeholders could use it as "on the field" literature to be used in their projects.

What are the main engagement strategies followed by your project to recruit end-users?

HESTIA created an inclusive and participatory strategy for engaging households in the design and development of the HESTIA platform and the DR proposed solutions. Co-creation, as the ongoing involvement of all relevant stakeholders (not just users/householders), has proven to be a fundamental and challenging task to create DR projects with a bottom-up approach. Challenges, like the pandemic which was happening during the first steps of this process, brought about the need to rethink the engagement approach (*e.g.*, face-to-face interactions were partly replaced with virtual home tours and online interviews in order to keep a continuous line of communication with users). The most important lesson learnt by the project is related to the need to keep project participants in continuous communication with the project developers — making them aware of the process and their involvement at each stage. Community-collective engagement has proven to be very important to participants, rather than just individual engagement in single households. Furthermore, issues related to age, socio-cultural background, gender, and digital literacy have been considered in the engagement process and, as a result, HESTIA has developed recommendations for inclusivity and participation of different household typologies which can be further developed for future DR and energy communities' projects.

SENDER structured its engagement strategy in three phases: the first phase focuses on recruitment, and it is dedicated to dissemination of information materials, events, workshops, individual energy counselling, and surveys; the second phase focuses on social pressure and gamification, which highlights the benefits of participating while involving citizens in the actual rollout and installation activities; the third phase focuses on persistence, which involves setting up an online forum, signing on beta users, arranging exhibitions and seminars, and measures to demonstrate the actual impact of their DR actions to the citizens.

ReDREAM's engagement strategy is based on three pillars: first, to provide benefit over time in order to maintain user engagement throughout the project; second, to offer added value so that benefits obtained are greater than the costs involved; and third, to build a trustful ecosystem. In addition to these pillars are a complementary set of principles that guide the design of engagement strategies and the ecosystem: personalization, feasibility, transparency, simplicity, discoverability, and automatization.

Regarding recruitment strategy, ReDREAM defined a threefold approach based on target, messages, and channels. Moreover, two strategic approaches to recruitment were applied. Initially, a "motivation-to-eligibility" strategy was followed, targeting users with allegedly mid-to-high levels of motivation and then assess their eligibility to join the project. Demos are oriented to test implicit and explicit flexibility electricity provision and can last from three to twelve months. Economic benefits, identity confirmation, environmental gains in the form of reduced carbon emissions, and community value provision were used as the basis for the recruitment messages. This approach was complemented with an "eligibility-to-motivation strategy," targeting users with necessary equipment and using messages to demonstrate the value they will glean from participating in the project. However, a limitation to this targeting strategy is that there is not a database of households that include their heating/cooling system. Nevertheless, an analysis of the electric consumption of members, among other strategies, could serve to identify members with heat pumps or EVs insofar as they would have a greater than average consumption.

ACCEPT is focusing its engagement strategy on awareness raising campaigns, recruitment – primarily carried out through the pilot partners who acted as "gate keepers" to their communities – and planning for engagement activities including workshops, one-to-one meetings, and presentations. Furthermore, the elaboration of communication material is playing a crucial role in ACCEPT's engagement strategy, as it enables the process of building trust between the pilot leaders and the local communities. The recruitment strategy is still being implemented.

iFLEX's engagement strategy is focusing on the recruitment of end-users (residential energy consumers and prosumers) from

the three pilot sites that are being deployed in Finland, Slovenia and Greece, by using personal and direct communications; promoting short and clear surveys in the registration phase in order to provide additional information about devices, energy-awareness and incentives; offering free equipment installation; prizes; promoting the opportunity to be part of the environmental and innovation activities of iFLEX project; and creating communication campaigns on the pilots websites and social media accounts.

Did you have to adjust your engagement strategies in any way? If yes, why was that (different culture in each pilot area, gender aspects, types of users, etc.)?

ReDREAM identified eight archetypes depending on the users' interest or prior engagement with energy (non-conscious, conscious, active and participative) and their technological readiness and/or attitudes towards technology (Tech wary, Tech enthusiasts, Tech agnostic and Tech conformist), (Gómez-Barredo *et al.*, 2021). The engagement strategies were adapted to these archetypes, especially in the recruitment stage. This implied that different messages and channels were used to cater to the main motives sought of each archetype, their concerns about privacy or data sharing or ability to use technologies. Since archetypes were differently represented across countries, the recruitment strategy was consequently adapted to the countries.

iFLEX adjusted its engagement strategy based on the feedback from the end-users. To illustrate, in the pilot deployed in Greece, participants with water boilers, as flexible resource, were the main engagement target at first, however, due to a limited number of such (as many people use solar powered boilers), other heavy-consuming devices and smart plugs, owned by participants, are also considered by the pilot hosts to be included into the project in order to not to lose flexibility assets; a device or other resource that is able to adjust electricity consumption based on network needs.

What kind of barriers and challenges did your project face during end-user engagement? How did you overcome these? What are the challenges you expect to face in the next steps of your project?

ReDREAM faced three main challenges during recruitment. First, the difficulties in locating eligible users, especially in climatic areas where heating is gas operated and PVs/EVs are not widely adopted. This difficulty prompted co-creation exercises to unearth strategies to locate prospects with eligible participants (Valor *et al.*, 2022). Second, given the widespread difficulties in understanding what flexibility entails and given the different regulatory frameworks in each country, end-users find it difficult to understand the benefits of participating in the project by providing flexibility. Thus, recruitment was intermingled with training and education actions. This combination proved effective: once users understand the wider challenges to energy systems in EU, they can see why their role in the energy markets need changing and can become more willing to participate. Finally, each demo location had a different profile of potential prospects. The initial research resulted in the identification of a set of archetypes. These archetypes were found in all demo locations, although the presence of each archetype varied across countries. To illustrate, ReDREAM found more active tech-wary consumers in Spain than in Croatia. Recruitment messages and channels were adapted to cater to these different profiles across demos.

iFLEX challenges in end-user engagement were related to legal and technical aspects. To illustrate the legal aspect: in the pilot deployed in Greece, the end-user invited to participate was not always the legal owner of the apartment. This fact led to a difficulty to obtain the legal consent of the owner.

As for the technical aspect, one challenge faced by iFLEX was ensuring that installed equipment was not altered or removed at end-user premises. For that purpose, iFLEX added additional clauses regarding fair usage of the smart metering equipment, prohibiting unauthorized users from tampering with the installed equipment. As it is a question of liability, clauses were added into the consents with end-users.

Finally, iFLEX also faced technical challenges due to the lack of standardization for semantic and technical interoperability of devices. As a result, iFLEX increased efforts, namely *via* reverse engineering, to ensure proper technical specifications for communicating with different devices while integrating them to iFLEX backend solution through smart home hubs.

How are you planning to keep your participants engaged throughout the project?

iFLEX is applying different approaches tailored to the pilot site. The first approach is to reward the participant. To illustrate, in the pilot deployed in Finland, a lottery to attract and retain end-users participating and responding to the survey launched is being implemented. In the pilot deployed in Greece a similar approach will be employed: in this scenario, end-users will earn points for participating in demand-response actions (*e.g.*, the more points earnt the more probabilities of winning a prize). The second approach is to offer a special customer package (product) for electricity, offering the end-users the opportunity to pay a lower price for electricity if they participate in the project.

For ACCEPT, the strategy to keep participants engaged is a crucial aspect and it can be really challenging to keep households connected to the project. The project is designed using a technology-driven approach, so households need to wait until technical aspects are finished before they will be contacted again, producing a lack of communication in between these steps. Thus, in order to stress the importance of user engagement, in ACCEPT a User Council will be installed, whose main objective is to restore the trust of the households, and a roadmap for user engagement activities is being designed. Finally, ACCEPT is using living labs (or local workshops) to not only increase the engagement of end-users, but also to promote

co-creation, as users will have the opportunity to provide feedback that will help to improve the final product.

Finally, for iFLEX and for ACCEPT, a central approach to participant engagement is to convey closeness, which is being accomplished by constantly communicating with the participants and continuously informing them about the project and their participation status, while providing them with technical support and a clear and identified point of contact in case of enquiries.

Does your project employ any co-creation activities with the end-users? If yes, which are they? Why do you think is important to include co-creation activities in innovation projects? What do you expect to get out of these?

Co-creation is a core process in HESTIA in a twofold manner: i) co-creation activities have been organised with the pilot users in order to actively include them in each step and as a way to get their input on the design of the HESTIA platform; ii) within the consortium, technical, academic, and industrial partners are constantly improving the engagement and platform services through an iterative and continuous feedback-based mechanism. HESTIA's partners trust that co-creation is fundamental as a way to transition from a passive consumer model to that of active participant involvement in the process of designing DR solutions for households. This also lies on the transition from a passive consumer to a prosumer, which has to be explained in simple and comprehensive terms to non-expert users. Co-creation in the HESTIA project has been used to assist participants in collectively understanding and learning about the purpose of household flexibility and therefore begin the process of collective construction of specific DR solutions for each pilot site. This collective learning process has varied across the pilot sites, since these represent very different characteristics in terms of socioeconomics, culture, housing routine, geography and with regard to capabilities (*e.g.*, digital literacy of participants, infrastructure available *etc*.). Another important benefit of co-creation is that it is a process which requires the involvement of all relevant stakeholders and, therefore, it contributes to an increased level of participation and engagement in the project through all relevant actors. Through this engagement by connecting and co-locating the actors of a project, the project is enriched with new insights and stakeholders are equipped with new competences required by the energy sector, such as how to improve user consumption and how to design strategies which are relevant to them.

In SENDER, co-creation has been implemented since the beginning of the project. The approach is to consider the point of view of the end-user (user experience), which means trying to demonstrate the practicalities of the technical aspects and how the technology deployed will benefit their everyday life. The user experience is important in order to guide further technology and solutions developments, as it helps to detect what truly matters to the end-user and determine whether what is being created is useful and easy to understand.

For those projects that have been through co-creation activities: A. Did co-creation deliver the insight/knowledge/effect you sought for? And have the efforts been worth it? B. On a scale from 1-10, how much have the users influenced the design of the technical solution(s)?

The HESTIA approach is based on a practice –theoretical perspective in order to explore and explain energy demand response as a component of everyday practices at home. Theories of practice direct the focus of household energy behaviour away from individual users, towards the understanding of more collective everyday consumption activities. By engaging people in collective interactions through co-creation, HESTIA explores the possible ways in which behavioural change inside the house can happen through the parallel shift of several interconnected practices (*e.g.*, shifting the time of the laundry implies a series of linked actions, such as the understanding of householders needs, their availability, their commitments, etc.). Through this basic understanding and review of common practices and the appreciation of social context (*e.g.*, accepted levels of comfort at home), HESTIA approaches the communities in the pilot projects and investigates how these shifts and changes can take place within the frame of participants' everyday life and routines. The results so far have shown that financial incentives can assist positively towards the desired shifts, however they cannot be the solution that sustains behavioural changes for the longer term. In HESTIA pilots, households prefer to work with their community for common goals, while also valorising financial and environmental benefits.

In SENDER, co-creation is a manner of measure that what is being created is rational and understandable, and it helps to address any objections more easily, as the participants in the demos have been part of the co-creation process. Thus, co-creation is not just a relation between users and providers, but it offers the added value of bringing together all the different solutions with the solutions developers in the project to create a better overview about all aspects to be considered. What it is important in co-creation is not just how much the users influenced the technological solutions, but also the knowledge gained about how the design will perform that was not previously known. In this way, the performance of the technological solution can be improved without necessarily altering the technical design, but rather working on expectation and how to accommodate it in the household.

What are the users' motivations to engage in a DR project or become part of an energy community? Economic/Financial (*e.g.,* energy savings), social (*e.g.,* social/community cohesion), environmental (*e.g.,* sustainability), etc.? Have you identified differences in motivations across your project's pilot sites? Is your project using any incentive mechanisms (rewards or punishments) to engage users (based on their motivations)?

In ReDREAM, it has been corroborated that motivation is multidimensional and that users have manifold and disparate motives for participating in the project. Nonetheless, three

main motives or forms of value have been identified as driving interest in participation: i) economic value sought (the main motivation being to obtain a financial reward in the form of payment or billing discount); ii) environmental value sought (the main motivation here is to reduce the carbon emissions associated with their own or collective energy consumption); iii) community value sought (the primary motivation is to foster community resilience and self-sufficiency, and enable an energy transition more attuned to human needs). Two other motives were also detected: iv) identity confirmation (to project or self-confirm an early adopter identity or an environmental identity) v) and epistemic (learning about energy consumption and the new energy landscape that is being built in Europe).

Regarding incentive mechanisms, the ReDREAM ecosystem embeds a gamified approach, and symbolic incentives are provided. These symbolic incentives, in the form of badges, are gained by solving other users' questions, sharing tips or best practices, or by participating in the challenges (dedicated tasks to achieve an individual or collective objective). Additionally, in countries where explicit flexibility is allowed, users may receive a small compensation for their flexiblilised energy.

As for ACCEPT, energy communities are dynamic entities with memberships that continuously evolve and change depending on intersectional lived experiences of participants (*e.g.*, life stage, social and financial resilience, etc.) that are formed by wider societal constraints and drivers (Lennon *et al.*, 2021). Consequently, it is difficult to identify a single motivating factor impacting the success or failure of a specific energy community or a citizen's engagement. There are numerous factors that influence local participation in community energy projects, including social, economic, environmental, political factors (Bamberg *et al.*, 2015; Dóci & Vasileiadou, 2015; Kalkbrenner & Roosen, 2016). (The results from an ACCEPT mini survey confirmed many of these motivations. It also revealed new reasons corroborating the rapid evolution of members' motivations for joining a CEC (Citizen Energy Community).

A main factor driving the engagement in CECs for a mini survey of ACCEPT participants regarding their interest in meaningfully addressing the climate change crisis. Their responses, presented in Lennon *et al.* (2021), included amongst other things a willingness to use locally available resources and reduce pollution generated locally. As reflected in the wider literature, participants indicated a strong motivation to push the energy transition forward in ways that were seen as being suitably just (Lennon *et al.*, 2019). Findings from the ACCEPT project also highlight a key motivating factor for forming a CEC is in tackling climate change in a meaningful and proactive way, while also securing one's own energy security. However, until recently the mechanisms to support such actions were not immediately apparent to many. Another significant motivating factor is the fear that the differing governance frameworks energy companies may be subject to in different jurisdictions may result in contrasting levels of service compared to companies operating closer to the customers' location (Lennon *et al.*, 2021). Consequently, through CECs, people can have their own infrastructure and decide themselves about the way electricity is produced. While it might appear that citizens have generally left it to governments and large energy companies to resolve pressing energy-related environmental problems. This is not usually the case. Rather, citizens often feel locked into energy structures that present them with a false narrative that they somehow have a choice to effect change (Lennon *et al.*, 2020). In addition, trust and confidence in existing energy incumbents to affect a change to a more sustainable and equitable energy system continues to wane.

Another motivating factor for citizens is taking part and learning how to use innovative technologies. Lennon *et al.*, 2021 also mention how one's personal sense of self can be enhanced by such actions. The potential savings in energy-related costs is another key motivation, especially given the current related energy and cost of living crises. As the authors note "CECs also offer the possibility to 'participate in development and investment subsidy programmes', as well as acquiring access to financial mechanisms that facilitate alternative forms of investment" (*ibid*, p23). Lastly, members are also motivated by have a certain "avant-garde feeling" while participating in a CEC.

How are the users reacting to the potential implementation of energy transition (*e.g.*, implementation of renewable technologies, smart technologies, *etc.*)? Are they aware of their benefits? Do they want to be involved in choosing which kind of technologies to be installed or not?

In the case of the Spanish Energy Community representative from the ACCEPT project, due to the high electricity prices in Europe, people in Spain are more and more willing to install renewable energy plants in their homes or businesses (Eurostat). In the Spanish case, the community was born as an Energy Coop with zero-emission supply, so people who became coop members were already quite environmentally aware (most already had PV installation for self-consumption or were planning to install one) and hence their understanding of the benefits of the energy transition is quite good. Besides RES, the users are open to the implementation of the Smart technologies, as they provide more information and controllability about the energy behaviour, although, the users require to be informed about what devices are going to be installed as they usually do not want to notice them. Finally, it must be considered that the apps to access to this information must be user-friendly.

For the ACCEPT Dutch Energy Community representative, engaging citizens was not a challenge due to the historical background (*e.g.*, in their neighbourhood the social system was designed like an energy community at the end of last century). Thus, citizens are fully aware of the impact of the energy transition. Furthermore, considering the actual extreme prices for energy (Eurostat), people are willing to implement changes as soon as possible. At the same time, people are very aware

of their needs and the type of interference they are willing to accept. Therefore, citizens require to be involved in the decision-making process and the execution process, being able at any time to select the kind of interference in the designing phase and in the implementation phase.

Do you think it would be beneficial to provide a minimum viable product (MVP) to the end-users to keep them engaged during the project, before having a well-defined version of the application interface they will use to look at, for example, their energy consumption?

As an ongoing process, HESTIA's project partners, especially the ones involved in the user engagement strategy, agree on the fact that it is fundamental to continuously keep users engaged to ensure behavioural change and practices shift can be reached on the long term, with a series of related benefits and co-benefits for the entire community. Apart from typical engagement activities, such as ongoing interactions in the pilots (workshops, focus groups and interviews), HESTIA aims at bringing the engagement process to a more inclusive level of participation by providing the pilot participants with the possibility to try, play with and give feedback on the initial product developed by the project partners, the HESTIA platform. Giving the participants the possibility to contribute to HESTIA platform in its initial version has a twofold possible benefit: i) the participants develop a collective ownership of the platform and therefore feel they need to get more involved in the project, by providing feedback and preferences of the possible features the platform can have in its final version and ii) it provides the developers of the platform with site- specific suggestions and improvements that can be made to make the HESTIA platform customized and attractive to the final users. This strategy is being implemented in the next steps of the project and aims to provide best practices and suggestions for further DR and energy communities projects.

Conclusions

The SP2022 workshop demonstrated that the five European Project have active engagement strategies to recruit and keep engaged on the medium- to long-term with the users involved. Co-creation activities, face-to-face meetings, virtual home tours, provision of information material, participatory workshops, and surveys are activities performed by the responsible partners in the projects. The engagement strategies have been usually organised in different phases and using different tools, related to the timeline of engagement, for improved efficacy. The use of key words and the focus on specific aspects of daily household life have been fundamental to defining these different strategies, personalising them and keeping them updated (especially during the lockdown due to the COVID pandemics). Motivation and eligibility of the final users were central points to take into account in each project to develop engaging recruitment material and messages. In all cases, awareness raising of the participants, especially related to the financial and environmental benefits of being part of an energy community or implement renewable energy technologies, was achieved through these different strategies.

As for the next steps, the sister projects are going to continue collaborating and sharing on-field experiences, with the aim of publishing a whitepaper in the Q1 of 2023. The whitepaper will include summarized information related to the projects efforts in facilitating energy transition through customized engagement strategies throughout the project's duration, and tips to project developers on how to overcome encountered barriers.

Ethics and consent

Ethical approval and consent were not required

Data availability

No data are associated with this article.

Acknowledgments

The authors acknowledge their partners from iFLEX project: Louise Birch Riley from In-JeT ApS (communication and dissemination lead); Athanasios Papakonstantinou, from HERON (Greek Pilot Representative); Anne Immonen, from VTT (Finnish Pilot Representative); and Andraž Javernik, from ECE (Slovenian Pilot Representative). From ACCEPT project: Andrea Moser, from EEE (Dissemination Lead); Paul Tobin from Smart Innovation Norway (engagement lead); and Breffni Lennon, from UCC (SSH co-lead). From ReDREAM project: Patrick Rembe from the European Science Communication Institute (ESCI). From HESTIA project: R2M team; Cluster Digital; and Aalborg University, for their active participation during the workshop and their contributions in the content of this document.

References

Bamberg S, Rees J, Seebauer S: **Collective climate action: Determinants of participation intention in community-based pro-environmental initiatives.** *J Environ Psychol.* 2015; **43**: 155–165.
Publisher Full Text

Dóci G, Vasileiadou E: **"Let's do it ourselves" Individual motivations for investing in renewables at community level.** *Renew Sustain Energy Rev.* 2015; **49**: 41–50.
Publisher Full Text

Gómez-Barredo V, Martino J, Ruiz L, *et al.*: **Report on social requirements, use cases and functionalities for ecosystem layers and social KPIs, Deliverable 1.1.** ReDREAM, 2021.
Reference Source

Kalkbrenner BJ, Roosen J: **Citizens' willingness to participate in local renewable energy projects: The role of community and trust in Germany.** *Energy Res Soc Sci.* 2016; **13**: 60–70.
Publisher Full Text

Lennon B, Dunphy NP, Gaffney C, *et al.*: **Citizen or Consumer? Reconsidering Energy Citizenship.** *J Environ Pol Plan.* 2020; **22**(2): 184–197.
Publisher Full Text

Lennon B, Dunphy NP, Sanvicente E: **Community Acceptability and the Energy Transition: a citizens' perspective.** *Energ Sustain Soc.* 2019; **9**(35): 1–18.
Publisher Full Text

Lennon B, Dunphy NP, Velasco-Herrejón P, *et al.*: **Energy Governance Analysis and typology for communities.** Cork: Research Report. 2021.

Valor C, Martino J, Ruiz L: **Flexible users, where are you? Conference paper presented at Sustainable Places Conference, Niza.** 6–9th September, 2022.
Reference Source

Open Peer Review

Current Peer Review Status: ? ? ?

Version 1

Reviewer Report 19 July 2023

https://doi.org/10.21956/openreseurope.16512.r32384

?

Jens Lowitzsch
Faculty of Business Administration and Economics, European University Viadrina, Logenstraße, Germany
Lucas Roth
Faculty of Business Administration and Economics, European University Viadrina, Frankfurt an der Oder, Brandenburg, Germany

We use the plural "we" as I have reviewed this article together with my assistant, Lucas Roth, who is familiar with the topic.

The open letter touches upon an interesting topic. It summarises a discussion between a range of different European-funded projects on "Fostering user engagement for innovative demand response for effective flexibility" during the Sustainable Places 2022 conference held in Nice, France, in September 2022. All included projects relate to demand response (DR) matters in the context of energy communities (EC). In a nutshell, the open letter summarises the view of five different project representatives' views on engagement strategies, barriers, co-creation, consumer motivation and technology acceptance. The underlying idea of disseminating experiences across different EU projects is well appreciated. Therefore, we thank the authors for their contributions and perspectives. Although we believe that the open letter presents interesting information, we suggest major improvements before publishing.

Major comments:

1. The abstract and the introduction are repetitive. We suggest reworking the abstract. The abstract should include additional information on the purpose of the letter. Further, it should pinpoint the most important takeaways. The latter is completely missing so far. Lastly, the abstract should include suggestions on how the results of the open letter may be used by whom in theory and practice.

2. Too little information on the project is presented. Individual summaries of all included projects should be included (e.g., in the appendix). In doing so, the reader can better grasp the meaning of the individual replies. In this summary, preliminary engagement KPIs on

targets and progress could be included.

3. The appendix should include a detailed description of the format of the held discussions (lengths, structured or unstructured, time frame etc.).

4. The presented project insights are very interesting. However, we are missing an overreaching discussion of the inputs given by the project's representatives. This discussion could focus on project views similarities and differences, including plausible reasons for presented manifestations. Further, the discussion could contrast the input of the representatives with existing research and policies. There is a valuable contribution, but the implications should be brought out more.

5. The conclusion should give a quick wrap-up of the results focusing on the most important aspects elaborated on in the preceding discussion. Further, we would expect a stronger policy focus. Given that the transposition of the RED II into national law is relatively young and in some cases, still ongoing, a practical view on country-specific legal frameworks and their implication for consumer engagement would greatly improve the manuscript.

6. The authors should improve the overall structure. The main parts should be differentiated from the questions answered by project representatives. We suggest including a separate main point after the introduction, like "input from project representatives" or "results of the conference" (only examples) under which the different questions are presented.

Minor comments

1. The open letter could benefit from language editing.

2. The content of the next steps should be brought out more. A "white paper" and the following elaborations are a bit ambiguous. Will it follow a similar structure as this open letter? To what extent will it be different to this work? Or will it be an original research article? Is there a specific methodology that will be used to evaluate the engagement programs? Where is supposed to be published (optional)?

All in all, the authors present compelling information on a cross-country base, which is very valuable. However, based on the above comments, we believe that major revisions are required before further considering the paper for publication.

Is the rationale for the Open Letter provided in sufficient detail? (Please consider whether existing challenges in the field are outlined clearly and whether the purpose of the letter is explained)

Partly

Does the article adequately reference differing views and opinions?

Partly

Are all factual statements correct, and are statements and arguments made adequately supported by citations?

No

Is the Open Letter written in accessible language? (Please consider whether all subject-

specific terms, concepts and abbreviations are explained)
Yes

Where applicable, are recommendations and next steps explained clearly for others to follow? (Please consider whether others in the research community would be able to implement guidelines or recommendations and/or constructively engage in the debate)
Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Policy, law, and economics in energy research.

We confirm that we have read this submission and believe that we have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however we have significant reservations, as outlined above.

Reviewer Report 27 June 2023

https://doi.org/10.21956/openreseurope.16512.r32379

?

Gianluca Carraro
Universita degli Studi di Padova, Padua, Veneto, Italy

The Open Letter deals with feedback and thoughts about 5 different projects on Energy communities in which each end-user is actively engaged in demand response programs.
The topic is of high scientific interest and the questions of the workshop address relevant aspects of EC formation and participation.

The focus is that of setting up a discussion to promote the exchange of information, practices and challenges. I think that this goal is quite general and should be further specified in drawing useful and practical guidelines for each addressed aspect in the questions.

Some general comments are listed in the following:

1. Some parts should be added to the Letter to clarify the context and help the reader identify useful guidelines. For example, I suggest adding an introduction explaining the status and progress of each project. Moreover, at the end of the answers to each question, I suggest adding a conclusive part that summarizes the common aspects emerged from the answers given by each project in order to end up with agreed guidelines.

2. I suggest verifying whether there are practical examples each time words such as "recommendations", "strategies", "activities" are used.

3. An added value could be that of providing some data about participation and engagement of users (e.g., if and how the number of users changed during the proposed activities) as well as technical data on achieved and achievable energy savings, economic revenues, self-consumption and renewable penetration of each project.

More specific comments are below:

1. Page 3: "*HESTIA has developed recommendations for inclusivity and participation of different household typologies*". These recommendations should be better explained and specified.

2. The concept of "*identity confirmation*" is used at page 3 and 6 without explaining the meaning and the details of it.

3. Page 4: "*iFLEX adjusted its engagement strategy based on the feedback from the end-users*". After this sentence you explain the case of an "indirect" feedback, where the engagement strategy failed (no participation of users with electric boilers) because of an inaccurate reading of reality (the majority of users use solar-powered boilers). Are you referring only to these kind of feedback or also to more "direct" feedback in which the users are directly involved in providing feedback?

4. Page 5: "*Co-creation in the HESTIA project has been used to assist participants in collectively understanding and learning about the purpose of household flexibility and therefore begin the process of collective construction of specific DR solutions for each pilot site*". I suggest giving more details about these "tailored" DR programs. How do the different aspects between pilot sites influence the DR programs?

Is the rationale for the Open Letter provided in sufficient detail? (Please consider whether existing challenges in the field are outlined clearly and whether the purpose of the letter is explained)

Partly

Does the article adequately reference differing views and opinions?

Yes

Are all factual statements correct, and are statements and arguments made adequately supported by citations?

Partly

Is the Open Letter written in accessible language? (Please consider whether all subject-specific terms, concepts and abbreviations are explained)

Yes

Where applicable, are recommendations and next steps explained clearly for others to follow? (Please consider whether others in the research community would be able to implement guidelines or recommendations and/or constructively engage in the debate)

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Design and operation optimization of multi-energy systems including energy communities.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Reviewer Report 23 May 2023

https://doi.org/10.21956/openreseurope.16512.r31277

?

Jose Villar
INESC TEC, Institute for Systems and Computer Engineering, Porto, Portugal

The paper deals with the results of several European projects related to the engagement of final consumers in the provision of explicit or implicit flexibility, and in the energy system in general. The topic is currently of very high relevance.

As a technical paper I think the work presented still needs a significant work to improve the results and to provide some methodological guides, which in my opinion should be the ultimate objective. In particular:

- It would be good to combine the results from the different projects in a unified and coherent vision. Projects should be treated as a support and further reference, but an interesting and relevant work would be this integral vision on engagement, potential actions depending on the environment or some additional inputs, instead of just enumerating what each project is doing related to this.

- In addition, the work as it is now presents results with a sometimes too superficial approach, lacking relevant data to be used by other that may be interested in the same field. Some details missing should be in the paper.

- As said before, as a result of the work done I would suggest the proposal of a methodology for customers engagement, based on the combination of the results of the projects considered in the paper, as well as from other results obtained from a literature review. The methodology may need particularizations depending on specificities such as zones or regions, ages, clients types, etc. which would provide this additional value which in my opinion is in the work done but missing in the paper: what are the possible actions or steps? how and when should they be taken? why? where or with whom are they expected to provide better success?

- As said, the work is presented like a survey, just enumerating the answers got from each project.

However, for me the survey is the starting point but the work should end-up in a unified methodological approach, highlighting specific actions if needed depending on types of customers, countries, etc.

Some other specific comments:

- "*Furthermore, issues related to age, socio-cultural background, gender, and digital literacy have been considered in the engagement process and, as a result, HESTIA has developed recommendations for inclusivity and participation of different household typologies which can be further developed for future DR and energy communities' projects.*"

  I think this is too general and more details would be welcome, such as a summary of the recommendations.

  The success of the different approaches of each project is not reflected in the document, only the strategies followed in a very rough way.

- "*This implied that different messages and channels were used to cater to the main motives sought of each archetype, their concerns about privacy or data sharing or ability to use technologies. Since archetypes were differently represented across countries, the recruitment strategy was consequently adapted to the countries.*"

  So what and how should be the messages depending on the archetype? What are the archetypes? Are they replicable in different zones, regions, countries?

  Archetypes are present in different zones with different probabilities. Even qualitatively it would be interesting to report this probabilities, and even try to explain this probabilities in terms of additional inputs, for a better replicability of the results.

- "*co-creation activities have been organised with the pilot users in order to actively include them in each step and as a way to get their input on the design of the HESTIA platform*"

  Which type of activities? Are there some useful and some other not? How these activities should be organized to be successful?
  How should co-creation be organized to be useful?

- "*identity confirmation (to project or self-confirm an early adopter identity or an environmental identity)"*
  This sentence should be better clarified.

  Related to incentives, it would be good a more detailed description of the incentives considered, and if possible an assessment of their importance in the engagement process.

  The symbolic incentives could be described in more detail for a better understanding.

- "*for ACCEPT, energy communities are dynamic entities with memberships that continuously evolve and change depending on intersectional lived experiences of participants*"

  Is this realistic? Are they really so dynamic entities? or is this just a conceptual view?

- "*There are numerous factors that influence local participation in community energy projects, including social, economic, environmental, political factors*"

  Which ones? why not providing the examples with much more clarity, instead of being so vague and therefore uninformative, when probably this information is there for the authors. This could improve in general the work presented.

  Are there differences in the engagement in REC or in CEC? Which ones and why?

  Sometimes it is surprising that only a few answers are for some of the questions. Although this is something indicated at the beginning, it could be good to explain why some projects were not able to answer specific questions.

Is the rationale for the Open Letter provided in sufficient detail? (Please consider whether existing challenges in the field are outlined clearly and whether the purpose of the letter is explained)
Partly

Does the article adequately reference differing views and opinions?
Partly

Are all factual statements correct, and are statements and arguments made adequately supported by citations?
Partly

Is the Open Letter written in accessible language? (Please consider whether all subject-specific terms, concepts and abbreviations are explained)
Yes

Where applicable, are recommendations and next steps explained clearly for others to follow? (Please consider whether others in the research community would be able to implement guidelines or recommendations and/or constructively engage in the debate)
Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: power systems, market models, RES integration, energy communities, flexibility markets

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.