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OPEN LETTER

REVISED Lessons learnt during the workshop "Empowerment of citizens: fostering user engagement for innovative demand response for effective flexibility"

[version 2; peer review: 6 approved with reservations]

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Abstract

This open letter captures key insights and recommendations from five European projects—HESTIA, SENDER, ReDREAM, ACCEPT, and iFLEX—focused on consumer engagement in Demand Response (DR) initiatives. Highlighting diverse and effective engagement strategies, including co-creation activities and virtual home tours, the letter underscores project partners' commitment to tailored and impactful user engagement. Emphasising phased organisation, varied tools, and keyword utilisation aligned with engagement timelines, the projects recognize adaptability, motivation, and eligibility as essential elements in crafting engaging recruitment materials. Addressing diverse contexts, continuous assessment is pivotal for achieving co-creation and active participation. The insights contribute to the evolving energy transition landscape, offering practical guidelines for those implementing or contemplating DR engagement strategies.

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REVISED **Amendments from Version 1**

The refinements made to the Open Letter aim to better meet the expectations of our valued readers. In general, we have enriched the content by including practical examples and case studies. This addition offers tangible illustrations of how these concepts can be applied in real-world situations; we have incorporated references to the project deliverables, which can be accessed here [https://zenodo.org/communities/lc-sc3-ec-3-2020?q=&l=list&p=1&s=10&sort=newest]. This will allow you to delve deeper into the detailed outputs of each project; we have improved the abstract, introduction and conclusive section to better encapsulate the insights learnt and offer a consolidated overview; we have added an Appendix featuring details about projects and the workshop format. This additional information aims to provide context and a deeper understanding of the projects discussed; finally, we have restructured the content, making it easier for you to navigate and comprehend the information presented.

Any further responses from the reviewers can be found at the end of the article

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Introduction

In April 2021, a pivotal collaboration emerged among five EU Horizon projects dedicated to demand-response (DR) and energy communities – 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 User Assets in a Multi-Market Scenario).

Initiating their endeavours in the early stages, these projects faced a pressing and shared challenge: the active involvement of users in their initiatives. Recognising the need for collective insights and knowledge exchange, the projects joined forces to enhance the utilisation of lessons learned and amplify the impact of their outcomes.

This open letter, following the structure established during the workshop held at the SP2022 (Sustainable Places 2022) conference, encapsulates the collaborative efforts of these projects. The workshop featured presentations of initial findings on user engagement and co-creation, prompting a semi-structured discussion among project representatives, both on a panel and with the engaged audience. Moderators facilitated this exchange by posing targeted questions to panel members, with subsequent contributions from the audience.

While time constraints limited comprehensive responses from all project representatives, this open letter distils the key aspects and activities undertaken, representing a collective effort to share valuable lessons learnt during the development of pilot sites. It emphasizes the transparent exchange of information, best practices, and challenges encountered throughout diverse activities, offering interested stakeholders a practical "on-the-field" resource for their own projects.

2. Conference Results

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

HESTIA has created an inclusive and participatory strategy for engaging households in the design and development of the HESTIA platform and the Demand Response (DR) proposed solutions. Co-creation, as the ongoing involvement of all relevant stakeholders, not just users/householders in the development of the platform, has proven to be a fundamental and challenging task, e.g. to create DR projects with a bottom-up approach. Challenges, like the pandemic restrictions which took place during the first months of the project, 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 to keep a continuous line of communication with users). The most important lesson learnt so far by the project is related to the need for keeping project participants in continuous communication with the project partners — making them aware of the process and the requirements of their involvement at each stage. Community and collective engagement have proven to be very important to participants, rather than just individual engagement of single households. Some of the pilot sites were already established energy communities, such as the Dutch pilot, whereas others, such as the Italian pilot, were in the process of being established. The HESTIA platform interface, which is co-designed with the users, therefore expresses the input of the community, as households can monitor not only their own energy but also watch the contribution or consumption of their neighbours. Furthermore, the co-creation activities have helped the project partners uncover issues such as the gendering of energy technologies and the unequal distribution of household labour at home between those who operate the energy technologies and those who perform the household tasks. Such challenges relating to the socio-cultural background, gender and digital literacy have been used as a base to compose recommendations for the design of DR solutions and for community engagement for different household typologies. Examples of these recommendations include the flexibility potential for different households, through the empirical insights of the HESTIA pilots, according to the time householders spend at home, and the recommendations for the coordination of everyday housekeeping with the digital housekeeping, which involves the interactions with the energy systems at home. Further details can be found in Deliverable D2.2: Participatory design recommendations & user engagement strategy as well as in the journal paper The gendering of energy household labour.

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 screening in eligible users, namely those with electrical assets that can be interrupted for a short period. To recruit these motivated users, messages emphasized the main benefits unearthed in the initial research: potential monetary savings, reduced environmental emissions, community self-sufficiency and resilience, or the anticipated pride in being an early adopter of these services. This approach was complemented with, and eventually replaced by an "eligibility-to-motivation strategy," targeting users with the necessary equipment and using messages to demonstrate the value they will glean from participating in the project. To identify these eligible households, ReDREAM proposed five strategies that could be used by demo managers to identify and locate households with the appropriate equipment (a detailed report of the engagement strategy proposed can be found in ReDREAM Deliverable 5.1. Qualitative Research Report on Consumer Engagement and Strategic Framework as a basis for Systems and Service Design.

ACCEPT is focusing its engagement strategy on awareness raising campaigns, recruitment – primarily carried out through the pilot partners who acted as "gatekeepers" 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.

In conclusion, the diverse engagement strategies outlined by the European projects—HESTIA, SENDER, ReDREAM, ACCEPT, and iFLEX— reflect a commitment to inclusive and participatory approaches in recruiting end-users for their respective initiatives. The challenges posed by external factors, such as the pandemic, prompted innovative adaptations, showcasing the resilience of these projects. The emphasis on community and collective engagement, as seen in HESTIA, underscores the importance of a bottom-up approach. SENDER's phased strategy, ReDREAM's pillars, and ACCEPT's focus on awareness and trust-building highlight the multifaceted nature of engagement. iFLEX's personalized communication and incentives demonstrate a tailored approach to end-user recruitment. Collectively, Together, these projects offer valuable insights into effective approaches for engaging end-users, emphasizing adaptability, personalization, and community collaboration as key components of successful recruitment strategies.

2.2. 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.)?

By means of in-depth interviews with the population served by the demo leaders, ReDREAM identified eight archetypes depending on the users' interest or prior engagement with energy (thus, differentiating among non-conscious, conscious, active and participative consumers) and their technological readiness and/or attitudes towards technology (Tech wary, Tech enthusiasts, Tech agnostic and Tech conformist). A full description of the archetypes and the evidence used in their construction can be found in ReDREAM Deliverable D1.1. Report on social requirements, use cases and functionalities for ecosystem layers and social KPIs. The engagement strategy, notably at the recruitment stage, was adapted to these archetypes so that different forms of value were emphasized in the messages and distinct channels were used depending on the technological readiness of the potential users. Since archetypes were differently represented across countries, the recruitment strategy was consequently adapted to the countries. To illustrate, in the UK potential participants were dominantly Tech wary. Social media did not prove effective to recruit; rather, face-to-face activities were more effective.

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. In the first phase most of the feedback was given informally and directly. In later phases, when inviting more pilot users, the pilot host adjusted and formalized the recruitment procedure with questionnaires and forms to have early information about potential pilot users and their flexible resources. Details and preliminary results about the recruitment and 1st phase of validation are available in deliverable D7.5 Pre-pilot deployment and validation.

Finally, as for HESTIA, Covid restrictions and lockdowns meant that HESTIA had to adjust the engagement process to accommodate these according to the conditions in each pilot site. To illustrate, instead of face-to-face interactions, such as participatory workshops, virtual home tours and interviews were arranged with participants through online platforms. The project partners were able, through these interactions, to keep participants engaged and to develop good insights regarding their everyday energy-related practices at home. The (face-to-face) participatory workshops still happened, with a delay, and having had the virtual interactions, gave the opportunity to have already developed some understandings of how people interact with their energy systems at home and in the community. Other adaptations included the organisations of women only focus groups, after realising that the gendering of energy technologies and of the everyday housekeeping needed special attention and consideration in the design of the platform.

In conclusion, the projects ReDREAM, iFLEX, and HESTIA demonstrate a keen awareness of the need for adaptive engagement strategies in response to various factors. ReDREAM's tailored approach based on user archetypes and technological readiness reflects a nuanced understanding of diverse populations, leading to country-specific adjustments for effective recruitment. iFLEX's responsiveness to end-user feedback, particularly in the Greek pilot, showcases a dynamic strategy that evolves based on the availability and characteristics of flexible resources. HESTIA, confronted with the challenges posed by the global pandemic, adeptly modified its engagement process, incorporating virtual interactions and specialized focus groups to address gender dynamics. These projects collectively underscore the importance of flexibility and responsiveness in engagement strategies, emphasizing the necessity of adjusting approaches to cultural nuances, user types, and unforeseen circumstances for successful project implementation.

2.3. 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 that eventually crystallised in the proposal of five strategies to recruit users for flexibility provision (Valor *et al.*, 2022). Second, given the widespread difficulties that consumers encounter in understanding what flexibility entails, recruitment for the project had to be complemented 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 as flexibility providers. Nonetheless, the recruitment process proved to be lengthier and more costly than initially thought. ReDREAM lacked factual evidence to develop trustworthy propositions about the benefits that consumers would obtain by participating as flex providers and this limited the appeals used and their persuasiveness.

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 unauthorised 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 standardisation 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. Similarly for HESTIA, challenges related to access to participants as well as pre-existing agreements with the community's property developers. For example, in the Dutch pilot contractual agreements had been made regarding the potential DR solutions and action (such as arbitrage and automation), which means that householders did not have many options or benefits by joining a DR scheme, since a lot of the operations were already automated. However, after focus groups and workshops, the project partners realised that participants are interested in the community energy (savings), so adapted their use case to reflect this. Other challenges included the non-homogenous ownership and access to smart technologies, such as energy meters and programmable appliances (e.g washing machines), which makes it difficult for households to participate in given notifications from the HESTIA platform. This uneven accessibility and digital literacy, combined with the specific socio-cultural norms, are really important issues to address when designing DR solutions.

In summary, ReDREAM, iFLEX, and HESTIA encountered distinct yet interconnected challenges during their end-user engagement phases. ReDREAM faced difficulties in locating eligible users in specific climatic areas and overcoming consumer misconceptions about flexibility, ultimately addressing

these through co-creation exercises and a combination of recruitment, training, and education initiatives. iFLEX navigated legal complexities related to property ownership, technical challenges in equipment safeguarding, and standardization issues, mitigating these obstacles through clear contractual clauses, enhanced security measures, and intensified efforts in achieving device interoperability. HESTIA grappled with pre-existing agreements in the Dutch pilot, emphasizing the importance of adapting use cases based on participant interests. Moreover, challenges related to non-homogeneous access to smart technologies highlighted the need for inclusive design considerations. Collectively, these projects highlight the multifaceted nature of barriers in end-user engagement, underscoring the importance of flexibility, adaptability, and a holistic understanding of legal, technical, and sociocultural factors in overcoming challenges and refining strategies for future project phases.

2.4. 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.

HESTIA, in a similar manner, is keeping participants engaged through regular communications, through email, telephone calls, and different kinds of interactions, such as focus groups and workshops. All the pilot leaders have developed direct and personal relationships with the participating households, therefore making sure that participants can contact them with any questions and issues to discuss and vice versa.

Finally, for iFLEX, ACCEPT, and HESTIA 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.

In conclusion, iFLEX, ACCEPT, and HESTIA employ diverse strategies to maintain participant engagement. iFLEX customizes approaches like lotteries and special customer packages for each pilot site, while ACCEPT introduces a User Council and living labs for co-creation. HESTIA ensures regular and personalized communication through various channels. All projects prioritize closeness, emphasizing ongoing participant communication and providing clear support channels. These practices reflect the projects' commitment to personalized and responsive engagement, crucial for sustained participant involvement and project success.

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:

1. With users and communities: co-creation activities have been organised with participating households and associated stakeholders, such as municipalities, in order to actively include them in each step and as a way to get them actively involved in the design of the HESTIA Platform. It is important for HESTIA to involve participants in such collective manners, as a community rather than only as individuals or as households, to make sure that all perspectives are shared and accommodated in the design process and that possible inequalities are revealed. For example, during the first year of the project, workshops in all three pilot sites, presented the project to the communities, and ran different co-creation activities, such as role-playing games, drawing sessions and 'serious' board games relating to community and household energy, in order to get all stakeholders familiar with DR terminology and application, as well as discuss in open dialogue what this means for their home and community. These co-creation activities revealed that energy flexibility of everyday energy-related practices rely on shared societal and household rhythms, negotiations and dynamics, as well as available infrastructures, locally and nationally. Co-creation therefore has helped reveal these negotiations and dynamics and assists in the establishment of shared understandings and practices.
2. Within the consortium: technical, academic, and industrial partners are regularly coming together to discuss 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 in the process of designing DR solutions for households and communities. Through

virtual and face-to-face workshops and annual meetings, the consortium partners are engaging in learning processes, attempting to break the silos of each other's disciplines and adopt a shared language and understanding of the project's objectives and user engagement. This has not been an easy process, since it takes time and effort to align expectations and contributions, however, it has been a good attempt to frame the challenges and opportunities of household DR through multiple perspectives, including experts (in the consortium) and non-experts (in the community). More details about the co-creation activities and learnings so far can be found in D2.2: Participatory design recommendations and user-engagement strategy.

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.

In conclusion, co-creation is central to the HESTIA project, involving both end-users and consortium members. Through diverse activities and continuous feedback mechanisms, HESTIA actively engages participants in shaping the project's direction, emphasizing community perspectives. Similarly, SENDER prioritizes co-creation, focusing on the end-user experience to guide technology development. Both projects contribute valuable insights into the challenges and opportunities of household Demand Response. The ongoing collaboration within the consortium reflects a commitment to breaking disciplinary silos and fostering shared understanding.

2.6. 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 and convenience at home), HESTIA approaches the communities in the pilot projects and investigates how these shifts and changes can happen 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.

In summary, HESTIA and SENDER projects emphasise the vital role of co-creation in understanding and shaping household energy practices. HESTIA highlights the need for community-driven initiatives alongside financial incentives for sustainable behaviour change. In SENDER, co-creation not only influences technological solutions but also enhances overall system understanding. Both projects stress the ongoing importance of collaborating with end-users for impactful innovation in demand response solutions.

2.7. 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 saving 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). In addition, two other motives were detected: iv) anticipated pride for being an early adopter of flexibility services; v) and epistemic motivation (learning about energy consumption and the new energy landscape that is being built in Europe).

Two types of incentive mechanisms are used in ReDREAM. First, symbolic incentives are embedded in the ecosystems, so that users can gain badges for completing challenges involving implicit flex provision, by sharing tips in the social network and by responding to other users' questions about energy use. Second, monetary incentives are provided in countries where explicit flexibility is allowed. For instance, in the UK, users receive a small compensation for their flexibilised energy. In Spain, they get a discount on PV installation if they join the project. Additionally, the technological approach used in ReDREAM for flex provision enables energy efficiency, so that users may see their billings reduced (the final amount saved depends on the energy tariffs in each country).

As for ACCEPT and HESTIA, 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. As outlined in Deliverable 3.6 Report on existing European energy communities and success factors from the ACCEPT H2020 project, there are numerous factors that influence local participation in community energy projects. Participation is impacted by often contradictory social, economic, environmental, and political factors (see also, Bamberg *et al.*, 2015; Dóci & Vasileiadou, 2015; Kalkbrenner & Roosen, 2016). For example, the desire to join an energy community can be predicated on the views of a family member or a desire to invest in a project in order to receive a financial reward. Given that CECs include all types of energy projects, not just those using renewable energy (i.e., RECs), ACCEPT focuses on CEC engagements. The results from an ACCEPT mini survey confirmed many of these motivations and reflect the rapid evolution of members' motivations for joining a CEC (Citizen Energy Community). Furthermore, the participatory workshops and focus groups in HESTIA revealed that these interconnected issues and motivations for engaging with DR programmes are linked to what residents call 'ecological motivation', which relates to their sense of responsibility and contribution towards a cleaner energy future for their families and community.

A main factor driving the engagement in CECs for a mini survey of ACCEPT participants regarding their interest in meaning- fully 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 smart technologies. Lennon *et al*., 2021 also mention how one's personal sense of self can be enhanced by such actions. Participants in HESTIA for example suggested that upgrading their home's energy system and learning how to operate it contributes to a better wellbeing for the family and contributes to the upgrade of the community. 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 having a certain "avant-garde feeling" while participating in a CEC.

In conclusion, the motivations for engaging in Demand Response (DR) projects or becoming part of energy communities are multifaceted and vary across projects. In ReDREAM, economic, environmental, and community values, along with pride and epistemic motivation, drive participant interest. Incentive mechanisms, both symbolic and monetary, are used to encourage engagement. ACCEPT and HESTIA emphasize the dynamic nature of motivations within energy communities, shaped by intersecting lived experiences and wider societal factors. Motivations range from addressing climate change, enhancing personal well-being, and learning about innovative technologies to financial savings and a sense of avant-garde participation. While motivations may differ across pilot sites, a common theme is the desire for a more sustainable and equitable energy future. These projects highlight the importance of understanding diverse motivations and utilizing incentive mechanisms tailored to individual and community needs to foster sustained engagement and participation.

2.8. 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 back- ground (*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 feel the need 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.

Control, digital literacy and privacy were issues that were encountered in HESTIA. Participants overall welcomed the new smart technologies in their homes; however, they were often sceptical of issues of control, in the cases where automation was present. For example, householders in the Dutch pilot were upset when roof windows opened automatically overnight to improve the indoor air quality. While they were happy with their home's responsiveness, they wanted to have a way to override the system. Other examples include householders manually checking the temperature in their homes, to confirm their thermostat, as they did not feel the thermal comfort they expected. Another important challenge for new energy technologies coming in the home is that they are not neutral, but often designed with a certain (male, educated and rational) profile, termed in academic literature as 'Resource Man' (Strengers, 2013). This can create challenges in the community but also within the home, as it can exaggerate pre-existing (and gendered) roles such as the operation of technologies (mostly undertaken by men) and the performance of everyday housekeeping (mostly done by women). For more insights on this matter please see The gendering of energy household labour paper, published in the Buildings & Cities journal.

In conclusion, the reactions of users to the potential implementation of energy transition measures vary across contexts. In the Spanish Energy Community from ACCEPT, members, already environmentally aware, embrace renewable energy and smart technologies, emphasizing the need for user-friendly information apps. The Dutch Energy Community in ACCEPT, rooted in a history of community-based energy systems, is eager for changes amid soaring energy prices, demanding active involvement in decision-making. In HESTIA, users generally welcome smart technologies but express concerns about control, digital literacy, and gendered impacts, highlighting the importance of user empowerment and addressing technological biases. These diverse responses underscore the necessity of clear communication, user-friendly interfaces, and inclusive decision-making processes in effectively implementing energy transition measures.

2.9. 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.

In conclusion, HESTIA recognizes the fundamental importance of continuously engaging end-users to drive behavioural change and ensure long-term project success. The strategy of providing a Minimum Viable Product (MVP) to participants allows for their active involvement, fostering a sense of collective ownership and enabling valuable feedback. This approach not only strengthens user engagement but also

contributes to customizing the platform for the end-users' preferences. The ongoing implementation of this strategy is expected to yield best practices and valuable insights for future Demand Response (DR) and energy community projects.

3. Conclusions

The SP2022 workshop illuminated the diverse and effective engagement strategies employed by the five European-funded projects, showcasing their dedication to recruiting and activating users for Demand Response (DR) solutions over the medium to long-term. These strategies, ranging from co-creation activities to virtual home tours, underscored the commitment of project partners to tailored and impactful user engagement.

To gather key insights and contribute to best practices, the projects prioritised phased implementation and use of a suite of mixed methods that best aligned with the timeline of engagement, while also accounting for unforeseen externalities. Incorporating keywords and focusing on specific aspects of daily life facilitated personalisation and adaptability, particularly amidst the challenges posed by the COVID-19 pandemic. Recognising the pivotal role of motivation and eligibility, the projects crafted engaging recruitment materials and messages.

Navigating diverse geographic and socio-cultural contexts, achieving co-creation and active participation demanded continuous assessment to ensure alignment with community needs and infrastructural support. Leveraging shared on-field experiences, the projects now set their sights on sustained collaboration with the communities at the centre of each project.

In anticipation of the challenges and opportunities ahead, the sister projects aim to publish a comprehensive white-paper in Q1 of 2024. This document will not only collect insights from their collective efforts but also offer practical guidelines and recommendations for project developers. These guidelines will encompass overcoming encountered barriers and fostering effective user involvement in Demand Response (DR) initiatives, providing a valuable resource for the evolving landscape of energy transition projects. Drawing from the lessons learned during the SP2022 workshop, and with the aim of providing valuable insights to projects currently implementing or considering engagement strategies, the sister projects offer the following recommendations:

1. Diverse engagement strategies: employ a range of strategies for tailored and impactful user engagement, as highlighted in the SP2022 workshop.
2. Phased implementation: organise engagement strategies into distinct phases for enhanced efficacy and adaptability, aligning with the timeline of engagement.
3. Keyword utilisation: incorporate targeted keywords and focus on specific daily life aspects to facilitate personalization and adaptability.
4. Adaptability in crisis: be prepared to adapt strategies during challenges, maintaining flexibility for continued effectiveness, particularly in the face of unforeseen circumstances like the COVID-19 pandemic.
5. Motivation and eligibility: craft engaging recruitment materials recognizing the central role of motivation and eligibility criteria.
6. Continuous assessment: navigate diverse contexts through continuous assessment, ensuring alignment with community needs and infrastructural support.
7. Sustained collaboration: foster collaboration and knowledge-sharing among project partners, leveraging shared on-field experiences for enhanced effectiveness.
8. Overcoming barriers: proactively address encountered barriers and provide strategies for effective user involvement in DR initiatives.

These recommendations serve as a guide for project developers, offering valuable insights to enhance user engagement in the evolving landscape of energy transition projects.

4. Appendix- Project and Workshop Details

A collaboration between 5 sister projects funded under the European Union's Horizon 2020 call topic LC-SC3-EC-3-2020: *Consumer engagement and demand response*.

- **SENDER** - Sustainable consumer engagement and demand response (GA No 957755)
- **ReDream** - Real consumer engagement through a new user-centric ecosystem development for end-users' assets in a multi-market scenario (GA No 957837)
- **ACCEPT** - Active communities & energy prosumers for the energy transition (GA No 957781)
- **HESTIA** - Holistic demand response services for European residential communities (GA No 957823)
- **IFLEX** - Intelligent assistants for flexibility management (GA No 957670)

SENDER

The SENDER project will foster sustainable innovation in the energy market, with explicit focus on energy services like demand response (DR), home automation and novel ways of producing electricity locally (prosuming) and trading between neighbours. To achieve this, customers will be enrolled in a co-creation process to make sure the solutions consider the needs and concerns of end users. Furthermore, consumer data will be used to identify typical consumption patterns and mirrored by digital twins (DTs) based on artificial intelligence technologies. SENDER enrols 400 customers across three demo sites in Finland, Austria and Spain.
https://www.sender-h2020.eu/h2020/

ReDream

ReDREAM project wants to overhaul the energy sector and to empower consumers – households and industry – by putting them at the heart of an all-new co-creative ecosystem. To achieve this, the project brings together 15 partners from

8 European countries. Underlying this ecosystem is a platform that uses cloud services and artificial intelligence to collect and evaluate information. This provides for more efficient production, distribution and use of energy, thus reducing CO2 emissions. All the major stakeholders from the energy sector are to be involved in the ecosystem – from energy suppliers who provide gigatons of electricity every day, to consumers who use this electricity. Information on weather and renewable energies will be fed into the ecosystem while smart devices will contribute with data on energy consumption patterns.
https://redream-energy-network.eu/

ACCEPT

In order to maximise the grid integration of variable renewable energy sources in a cost-efficient way, ACCEPT aims to untap the demand flexibility potential from energy communities by actively involving them and their members in the project activities. To achieve this, the project will develop and deliver a digital toolbox which will be used by the energy communities and prosumers to achieve certain objectives. These objectives include i) the development of innovative digital services, for the community members and customers and ii) the access to revenue streams that will support the longevity and the well-functioning of the community itself. The critical success factor of the ACCEPT solution will be to deliver a minimum viable product that has passed preliminary market and financial testing.
https://www.accept-project.eu/

HESTIA

HESTIA aims to develop a cost-effective solution for the next-generation demand-side response services by encouraging residential consumers to engage in flexibility sharing and grid balancing. User-personalised services, delivered via a flexible ICT platform, underpinned by agent-based concepts and non-intrusive data analytics, will help lay the foundation for an open marketplace and new grid reality. The HESTIA solution will be demonstrated in three residential pilot set-ups (in Italy, France and the Netherlands), with different infrastructural, climatic, market and regulatory contexts, enabling different business models and levels of provided energy services, across different categories of consumers (e.g., social category, age, technology literacy and gender). HESTIA aims to engage 116 households (representing over 250 consumers) in the pilot sites and will propose replication plans for another three "follower" residential communities across Europe.
https://hestia-eu.com/

IFLEX

The aim of the iFLEX project is to make it easy and attractive for energy consumers to engage in flexibility services in which they adjust their energy consumption in response to price signals, flexibility requests or other incentives coming from the energy system. Energy consumers play a crucial role in balancing the energy system, as they control a large share of energy-flexible resources. To enable the consumer to manage flexibility easily, iFLEX is developing an intelligent iFLEX assistant who handles all the complexity of system interactions on behalf of the consumer.

To show the versatility of the iFLEX solution, the framework and assistant applications are demonstrated in three European countries (Finland, Slovenia, Greece), involving more than 600 consumers and 3 consumer groups targeted with novel demand response services.

The iFLEX solution enables the consumer to benefit economically through cost savings or rewards for being flexible and for contributing to a more sustainable living. The energy actors can procure and leverage more consumption flexibility in the balancing of demand with supply and for optimal power grid operation, with the iFLEX solution providing the predictability, reliability and accessibility needed for flexibility modelling and management.
https://www.iflex-project.eu/

Workshop details

On the 8th of September 2022, the five European projects hosted a 90 minutes workshop entitled "*Fostering User Engagement for Innovative Demand Response to Enhance Flexibility*" during the Sustainable Places 2022 Conference.

The workshop dealt with user research and engagement as the key driver for innovation of digital & technology-based demand response solutions, with the aim to frame a good user experience and an effective energy & flexibility performance, which will help customers engage more in new energy services. The workshop offered an overview on experiences from user engagement activities at the pilot sites of the five sister projects and focused on knowledge exchange to improve implemented strategies, tools and platforms. It also offered a unique opportunity for sharing findings and results when implementing the project activities at the corresponding pilot sites. All projects shared a vision of advancing digital & technology-based solutions for the overall energy transition process at an EU level, the flexibilization of the energy market, new demand-response strategies/solutions, the promotion and creation of active citizens and energy communities, and the development of new services, actors, and roles within the current and the future energy ecosystem.

Apart from providing an overview of the engagement methodologies and key activities that each project has followed to date, a strong focus was given to sharing experiences on co-creation activities carried out within each project, which helped refine their scope, objectives and technical solutions.

The format of the sessions consisted of initial presentations of each project on objectives, goals and insights from user engagement, co-creation and pilot activities. Finally, a round table about the topics listed below was organized, using collaborative tools to gather contributions from participants,

especially the end-users/ energy communities engaged at each site. The list of topics that were discussed during the workshop were based on the following ones:

TOPIC I – Pilot Site Landing: Pilot Site profiling/characterization, User Recruitment, communication & interaction with citizens, methodologies used, challenges, benefits, etc.

TOPIC II – Co-creation activities: Overview of solutions, use cases and scenarios implemented by each project. Highlights of co-creation activities carried out to date and how they helped shape/improve/enhance the scope of the projects, their objectives and technical and social outputs.

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). 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.

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Mohammad Fazle Rabbi
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The manuscript titled "Lessons learnt during the workshop 'Empowerment of citizens: fostering user engagement for innovative demand response for effective flexibility'" presents valuable insights from five European projects (HESTIA, SENDER, ReDREAM, ACCEPT, and iFLEX) focused on consumer engagement in Demand Response (DR) initiatives. The document captures key strategies, challenges, and recommendations derived from these projects, offering practical guidelines for stakeholders involved in similar endeavours. However, there are several areas where the manuscript could be improved to enhance its clarity, depth, and utility for the reader.

Specific Comments:

Abstract
The abstract provides a concise overview of the manuscript's content but could benefit from more specific details about the key insights and recommendations. It would be helpful to include a brief mention of the practical implications and the target audience for these insights.

Introduction
The introduction effectively sets the stage for the workshop and the collaborative efforts among the projects. However, it could be strengthened by providing a clearer rationale for the open letter and explicitly stating the objectives and research questions of the manuscript. Additionally, a brief overview of the structure of the paper would help guide the reader.

Conference Results:

2.1. Main Engagement Strategies

- HESTIA: The section on HESTIA's engagement strategy is well-detailed but could benefit from more specific examples of the co-creation activities and their outcomes. The mention of "virtual home tours and online interviews" is intriguing but lacks concrete examples of how these were implemented and their effectiveness.
- SENDER: The phased engagement strategy of SENDER is clearly outlined. However, more

details on the specific activities within each phase and their impact on user engagement would be valuable.
- ReDREAM: The three pillars of ReDREAM's engagement strategy are well-articulated. Including examples of how these principles were applied in practice and their results would enhance this section.
- ACCEPT: The focus on awareness-raising campaigns and communication materials is noted. Providing specific examples of these materials and their effectiveness in engaging users would be beneficial.
- iFLEX: The personalized communication and incentives offered by iFLEX are well-described. Including data on user participation rates and the effectiveness of these strategies would strengthen this section.

2.2. Adjustments to Engagement Strategies
- ReDREAM: The adaptation of engagement strategies based on user archetypes is a strong point. However, more details on how these archetypes were identified and the specific adjustments made for each archetype would be valuable.
- iFLEX: The adjustments made based on end-user feedback are well-described. Including examples of the feedback received and how it was addressed would enhance this section.
- HESTIA: The adaptations made due to COVID-19 restrictions are well-documented. Providing more details on the outcomes of these adaptations and their impact on user engagement would be beneficial.

2.3. Barriers and Challenges
- ReDREAM: The challenges faced in locating eligible users and the strategies to overcome them are well-articulated. Including data on the effectiveness of these strategies would strengthen this section.
- iFLEX: The legal and technical challenges faced by iFLEX are clearly outlined. Providing more details on how these challenges were addressed and their impact on the project would be valuable.
- HESTIA: The challenges related to pre-existing agreements and access to smart technologies are well-described. Including examples of how these challenges were addressed and their outcomes would enhance this section.

2.4. Keeping Participants Engaged
- iFLEX: The use of lotteries and special customer packages is a strong point. Including data on the effectiveness of these strategies in maintaining user engagement would be beneficial.
- ACCEPT: The establishment of a User Council and the use of living labs are well-described. Providing more details on the outcomes of these initiatives and their impact on user engagement would strengthen this section.
- HESTIA: The emphasis on regular communication and personal relationships is noted. Including examples of how these strategies were implemented and their effectiveness would be valuable.

2.5. Co-creation Activities (The serial number (2.5) is missing from the manuscript)
- HESTIA: The co-creation activities and their importance are well-articulated. Including more specific examples of these activities and their outcomes would enhance this section.
- SENDER: The focus on user experience and its importance in guiding technology development is noted. Providing more details on the co-creation activities and their impact on the project would be beneficial.

2.6. Impact of Co-creation
- HESTIA: The insights gained from co-creation activities are well-described. Including more

specific examples of how these insights influenced the project would be valuable.
- SENDER: The importance of co-creation in improving the design of technological solutions is noted. Providing more details on the specific improvements made and their impact would strengthen this section.

2.7. User Motivations
- ReDREAM: The multidimensional nature of user motivations is well-articulated. Including data on the prevalence of each motivation and their impact on user engagement would be beneficial.
- ACCEPT and HESTIA: The dynamic nature of motivations within energy communities is well-described. Providing more specific examples of these motivations and their impact on user engagement would enhance this section.

2.8. Reactions to Energy Transition
- ACCEPT (Spanish Energy Community): The willingness to implement renewable energy plants is well-described. Including data on the number of users who have implemented these technologies and their impact on energy consumption would be valuable.
- ACCEPT (Dutch Energy Community): The awareness of the impact of the energy transition is noted. Providing more details on the specific actions taken by users and their outcomes would strengthen this section.
- HESTIA: The concerns about control, digital literacy, and privacy are well-articulated. Including examples of how these concerns were addressed and their impact on user engagement would be beneficial.

2.9. Minimum Viable Product (MVP)
- HESTIA: The importance of providing an MVP to keep users engaged is well-described. Including examples of how this strategy was implemented and its effectiveness would enhance this section.

Conclusions

The conclusions effectively summarize the key insights and recommendations from the workshop. However, they could be strengthened by providing more specific examples of how these insights can be applied in practice and the expected outcomes.

Recommendations

1. Provide More Specific Examples: Throughout the manuscript, include more specific examples of the strategies, activities, and outcomes discussed. This will help readers better understand the practical implications of the insights presented.
2. Include Data: Where possible, include data on the effectiveness of the strategies and activities discussed. This will strengthen the manuscript by providing empirical evidence to support the insights and recommendations.
3. Clarify Objectives: Clearly state the objectives of the manuscript in the introduction and ensure that each section contributes to achieving these objectives.
4. Improve Language and Formatting: Ensure that the manuscript is written in accessible language and that all subject-specific terms, concepts, and abbreviations are explained. Also, check for any formatting issues, such as cut-off words or inconsistent use of terms.

The manuscript presents valuable insights from five European projects focused on consumer engagement in DR initiatives. However, it would benefit from greater depth, global applicability, and empirical rigour. The manuscript has the potential to serve as a valuable resource for stakeholders involved in similar endeavours, with the suggested improvements. The insights and recommendations presented can help guide the development of effective engagement strategies and contribute to the success of DR initiatives.

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)
No

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?
Yes

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: sustainable development goals (SDGs), sustainability management, green management, circular economy, environmental economics and sustainability, renewable energy and sustainable energy, food security management, and sustainable food systems.

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 10 December 2024

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Yang Li
Northeast Electric Power University, Jilin, China

This letter captures key insights and lessons learned from five European projects focused on consumer engagement in Demand Response initiatives, highlighting diverse strategies, the

importance of personalization, adaptability during crises, and the central role of continuous assessment in fostering effective user participation and long-term collaboration in the energy transition. After revisions, the quality of this paper has been generally improved, but there are still the following concerns:

1) How do the engagement strategies outlined in this paper, such as co-creation activities and virtual home tours, contribute to enhancing the overall effectiveness of Demand Response (DR) solutions, and what are the specific mechanisms through which these strategies can be adapted and scaled in different geographical regions or socio-cultural contexts?

2) In what ways do the five European projects tackle the complex challenges associated with consumer engagement in the evolving energy transition, and how can the specific insights gained from these projects inform the design of future DR initiatives in non-European regions, particularly in developing economies?

3) The paper emphasizes the critical role of personalizing engagement strategies through targeted keywords and daily life aspects. Can you elaborate on the empirical or theoretical foundations for the effectiveness of this personalization, and how do these tactics influence both short-term user participation and long-term behavior change in DR programs?

4) Given the unprecedented global challenges posed by the COVID-19 pandemic, how did the projects modify their engagement strategies to maintain or increase user participation, and what specific adaptive measures proved most successful in addressing the unforeseen disruptions caused by the pandemic? What lasting lessons can be applied to future crisis management in DR initiatives?

5) The balance between adaptability and consistency in engagement strategies is central to long-term user involvement. How do the projects effectively integrate these two elements, and what are the key factors or frameworks that ensure adaptability without compromising the core objectives of sustained engagement and participation in DR solutions?

6) Motivation and eligibility are identified as pivotal elements in user recruitment and retention within DR initiatives. Could you expand on the specific behavioral theories or models applied in these projects to design recruitment materials, and how could these strategies be further refined to optimize the efficacy of recruitment in varying socio-cultural contexts?

7) Co-creation activities were highlighted as a central engagement strategy in these projects. Could you provide more detailed examples of how these activities were structured and evaluated, and what tangible outcomes were directly attributed to the collaborative co-design process between consumers and project teams?

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)
Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: renewable energy, energy transition, Energy Management

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 02 July 2024

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Benoit Couraud
University of Glasgow, Glasgow, Scotland, UK

This open letter provides a summary of the lessons learnt gathered from the workshop âEmpowerment of citizens: fostering user engagement for innovative demand response for effective flexibilityâ.
It describes the learnings from 5 European projects on engagement of citizens to participate in Demand Response activities. It addresses topics such as the engagement strategies to recruit end-users, the challenges of engaging with end-users and of keeping them engaged, the benefits from co-creation workshops, and how and why people would be interested in taking part in Demand Response events.

The open letter is informative, and most comments from the reviewers were addressed. Two main comments are still to be addressed to my opinion:
First, the main difficulty for the authors has been to finely tune the level of details to be included in

the paper. Indeed, the authors tend to be too general, providing information that are too high level to be relevant to the readers (such as most of the last sentences from each sectionsâ conclusions which are too general to provide any learning that readers could leverage in their projects), whereas readers (and reviewers) usually expect such work to provide them with concrete examples and learnings that will help and guide them in their future projects. As a result, the most informative parts of the paper are those that start with âto illustrate â¦â, âThe results so far have shown â¦â.
I would recommend the authors to try to update the current version with more concrete examples when it is appropriate (see more details below).

Second, it is difficult for the reader to understand what is important, what works and what does not, as there is no quantitative information on the results from the strategies provided by the projects. Indeed, different strategies are explained to keep end-users engaged (reward/economic reward, User Council, â¦), but the readers do not know what works actually. What are the losses in terms of user engagement ? Similar quantitative details would have been appreciated for all section in order to assess the relevance of each strategy/proposition in the paper. The reviewer understands how difficult it could be to gather this information, but this would strongly add value to the paper.

Minor comments:
Conclusions have been added but sometimes it does not make perfect sense as it only repeats the text above. For example, in section 2.4, the section has a conclusion that consists in 25% of the section, and repeats what was mentioned above. The reviewer believes the conclusion should be added only when it is providing a real summary that helps the reader to extract relevant information. If we consider the case of section 2.4 for example, a conclusion would be on what is best to keep participants engaged, among a lottery or community engagement through the council. But it then requires to gather such data to enable the comparison.

2.1: The key question here should be: based on the knowledge given in the paper, would readers be able to understand the key steps to achieve an effective recruitment campaign. The reviewer is not sure that this section provides enough details or examples to provide more than general advises.
Hestia: some numbers or quantitative advices should be given (on the way communication is kept constant with end-users. Is it through emails? Is there someone engaging every day ? â¦).
Similarly, more details on the solutions mentioned would have been much welcome (e.g. in SENDER, how many workshops per month is necessary to engage with end-users, what gamification was implemented in a nutshell, what was done related to the social pressure, â¦, in ReDREAM, what is meant by âadded valueâ, âcostsâ, what is meant by âtarget, messages and channelsâ -i.e. maybe specify the targets and explain the channels considered, and types of messages/constraints, â¦)?

2.2: Some of the content could be more precise, while trying to keep it condensed. For example, the 8 archetypes could have been listed. The main take-aways from the readers are that recruitment strategies should be adapted to the countries, which is a general statement, then the concrete examples provide the real information to the readers which will enable them to avoid issues encountered within the projects. Other examples:
âto have early information about potential pilot usersâ Ã what information is important to collect (in a nutshell) ? It would be interesting to knowâ¦

âfive strategies to recruit usersâ Ã It would be good to have a brief mention of each strategy, Â instead of just a link to a deliverable.

2.3:
âproject partners realised that participants are interested in the community energy (savings), so adapted their use case to reflect thisâ Ã the authors could maybe explain how the use case was adapted. This will give more concrete content to the readers.
Talking about training, marketing and education material, it would have been interesting to see some highlights, key elements of these, either through screenshot, or very quick summary of the training architecture, so people can have concrete examples of Â what works.
It is mentioned that the recruitment was more costly than foreseen. What budget should we consider in replicating the projects ?
On interoperability, it would have been good to have a description of what solution was deployed, which protocol was chosen, and so onâ¦
The conclusion âCollectively, these projects highlight the multifaceted nature of barriers in end-user engagement, underscoring the importance of flexibility, adaptability, and a holistic understanding of legal, technical, and sociocultural factors in overcoming challenges and refining strategies for future project phasesâ applies to all sections. So the reviewer questions the relevance of repeating it instead of adding more example that showcase this sentence.

2.4: ACCEPT: how far are they in the project, because the example given does not seem to highlight specific arrangements made to keep end-users engaged.
What are the financial engagements with participants, and what are the numbers for customers engagement through time ? what percentage of participants abandoned, in the case of financial motivation, and in the case of voluntary engagement ?

2.5: on the co-creation aspect, it would have been good to highlight better the key things that were changed based on these workshops. It is mentioned a little bit in the sentence âThese co-creation activities revealed that energy flexibility of everyday energy-related practices rely on shared societal and household rhythms, negotiations and dynamics, as well as available infrastructures, locally and nationallyâ, but maybe it could have been more specific.
Did the approach in SENDER use personae, what new use case were discovered, how did it change the project or the solution ?
2.6: The beginning of section 2.6 is mostly repeating the description of the project. The main interesting content starts with âThe results so far have shownâ¦â.

2.7: Numbers would have been appreciated to showcase what future projects should expect. Sentences such as âthere are numerous factors that influence local participation in community energy projects.â Or âconfirmed many of these motivations â Could be followed by a quick list of these factors or motivations, ranked by their impact on acceptability. Therefore, the following paragraphs that extend on these factors/motivations provide great value to the paper.

The reviewer guess that the mini survey that is mentioned in the paragraph on ACCEPT is the one from Lennon et. Ac (2021) ? in which case it would be good to cite it every time it is mentioned.

2.8: The Eurostat citations should come with a link.

RES: it looks like Renewable Energy Sources was not defined before.
âimplementation of the Smart technologiesâ Ã âimplementation of Smart technologiesâ

- Where does the information from the Spanish people come from ? surveys ? interviews ?

2.9: the answer could go quicker to the point/learnings/benefits listed.

Appendix:
If this is relevant, maybe the appendix could be separated into appendix A and B (for project details, and workshop details respectively). Appendix A could include some graphics that summarize each project, a quick overview (graphical) of the platform (e.g. HESTIA), â¦

English:

- Check the expression: âto not toâ
- Some words are cut âback- groundâ, âmeaning-fullyâ. This should be checked.

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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?
Yes

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: Energy communities, AI for future energy systems, energy 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.

Version 1

Reviewer Report 19 July 2023

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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.

Author Response 30 Jan 2024

Yeimy Ospina

Dear Reviewer, On behalf of ReDream, Accept, Hestia, iFlex, and Sender, we express our sincere gratitude for your revisions on our Open Letter *Lessons learnt during the workshop "Empowerment of citizens: fostering user engagement for innovative demand response for effective flexibility"*. Your comments have significantly contributed to refining our document, and we appreciate the time and expertise you devoted to this review. We would like to provide clarifications regarding your comments and highlight the improvements made to address your insights. Building upon this objective, please find below our concrete responses to your comments and suggestions:

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.*

Response: thank you for your feedback, we have rewritten the abstract following your suggestion.

1. *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.*

Response: an appendix containing project details has been established. However, it is important to note that, at the time of drafting this Open Letter, some projects lacked preliminary data regarding targets and progress.

1. *The appendix should include a detailed description of the format of the held discussions*

(lengths, structured or unstructured, time frame etc.).

Response: the appendix contains the requested information.

1. *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.*

Response: we appreciate your insightful suggestion. We have taken your feedback into consideration and, as a response, improved the conclusions for each question and the conclusion section itself. Additionally, we have added practical insights for interested stakeholders, reflecting the recruitment and engagement strategies that are being found most effective in the corresponding projects (albeit quantification of their effectiveness is still lacking). We hope these enhancements address your concerns and contribute positively to the document's overall value.

1. *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.*

Response: thank you for the suggestion. It is worth noting that this open letter does not specifically address policy matters. The ultimate objective of the paper is to publicly exchange information, sharing best practices and challenges identified during the different activities undertaken in our projects. By doing so, we aim to provide interested stakeholders with a valuable resource, akin to "on-the-field" literature or guidelines that can be applied to their respective projects, without the necessity to delve into technical or policy details.

1. *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.*

Response: thank you for your suggestion. We have restructured the Open Letter accordingly. **Minor comments**

1. *The open letter could benefit from language editing.*

Response: the document has been revised.

1. *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)?*

Response: Thank you for your inquiry. At this stage, specific details regarding the next steps, including the format (white paper, research article) and methodology for evaluating engagement programs, cannot be provided. In response to your feedback, we have removed the section from our Open Letter where these details were initially mentioned.

Competing Interests: No competing interests were disclosed.

Reviewer Report 27 June 2023

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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.

Author Response 30 Jan 2024

Yeimy Ospina

Dear Reviewer, On behalf of ReDream, Accept, Hestia, iFlex, and Sender, we express our

sincere gratitude for your revisions on our Open Letter *Lessons learnt during the workshop "Empowerment of citizens: fostering user engagement for innovative demand response for effective flexibility"*. Your comments have significantly contributed to refining our document, and we appreciate the time and expertise you devoted to this review. We would like to provide clarifications regarding your comments and highlight the improvements made to address your insights. Building upon this objective, please find below our concrete responses to your comments and suggestions:

- *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.*

Response: we appreciate your thoughtful comment. The primary goal of our paper is indeed to foster a public exchange of information, sharing best practices and challenges identified across various activities in our projects. Our aim is to offer interested stakeholders a practical resource, resembling "on-the-field" literature or guidelines that can be readily applied to their respective projects, without the need to delve into technical details. Taking into consideration your suggestion for greater specificity, we have incorporated practical guidelines for each addressed aspect in the questions. We trust that these enhancements contribute to the practical utility of the document.

- *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.*

Response: Thank you for your suggestions. We have taken your feedback into careful consideration and are pleased to inform you that the recommended enhancements have been implemented. An introduction has been added to provide context. Additionally, we have included a conclusive part at the end of the answers to each question, summarising the common aspects that emerged from the responses of each project. We believe these additions contribute to a clearer understanding of the document and the extraction of agreed guidelines. We appreciate your thoughtful input and hope you find the updated version more aligned with your expectations.

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

Response: In an effort to improve clarity and understanding, practical examples have been incorporated. Moreover, a shared repository has been established to grant stakeholders access to pertinent project deliverables. You can explore these resources through the following link: Search H2020 sister project collaboration on consumer engagement for demand response (zenodo.org).

1. 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.

Response: we appreciate your feedback regarding providing technical data on achieved and achievable energy savings, economic revenues self-consumption and renewable

penetration of each project. However, as per the Open Letter definition, the inclusion of new data and analysis is discouraged. While we cannot incorporate specific data on user participation, engagement, or technical metrics in the Open Letter, we have made efforts to enhance the document by including references to respective project deliverables. These deliverables may contain detailed information on participation, engagement, and technical outcomes for those interested in a more comprehensive understanding. We appreciate your understanding of these constraints and hope the additional references prove helpful. 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.

Response: to enhance clarity, several examples have been included. Additionally, we have directed the reader to consult Deliverable D2.2 for further details, along with a relevant journal paper generated during the project.

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

Response: the sentences have been revised to clarify the main benefit associated with identity confirmation: the anticipated pride for individuals in being and/or being perceived as early adopters of flex services (section 2.7).

1. Page 4: "*iFLEIX 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 this kind of feedback or also to more "direct" feedback in which the users are directly involved in providing feedback?

Response: the Greek pilot hosting partner's recruitment pool in the 1st phase was employees and their closest relatives. After signing the GDPR forms, prospective pilot participants were directly questioned whether they had an electrical boiler and if yes, whether it was solar powered. It was a combination of formal (through email) and informal methods (direct discussion), which revealed that an overwhelming majority of prospective pilot participants used autonomous Natural Gas boilers, and of those who didn't, most of them used solar powered boilers. To conclude, most of the feedback was given informally and directly. In later phases, when inviting more pilot users, the pilot host formalised some of the questions through forms for early assessment and user feedback. For some more details about the recruitment and 1st phase validation the results are available in deliverable D7.5 Pre-pilot deployment and validation. The open letter has been amended, providing more insight for the readers.

1. 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?

Response: In order to improve clarity, the paragraph has been revised. Furthermore, a link to the corresponding project deliverable has been provided for easy reference.

Competing Interests: No competing interests were disclosed.

Reviewer Report 23 May 2023

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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

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

Author Response 30 Jan 2024

Yeimy Ospina

Dear Reviewer, On behalf of ReDream, Accept, Hestia, iFlex, and Sender, we express our sincere gratitude for your revisions on our Open Letter *Lessons learnt during the workshop*

"Empowerment of citizens: fostering user engagement for innovative demand response for effective flexibility". Your comments have significantly contributed to refining our document, and we appreciate the time and expertise you devoted to this review. We would like to provide clarifications regarding your comments and highlight the improvements made to address your insights. The Open Letter under review encompasses visions and reflections from five distinct projects funded under the European Union's Horizon 2020 call topic LC-SC3-EC-3-2020: *Consumer engagement and demand response*, which are in different stages of execution. The collaborative efforts among these projects commenced in April 2021. Following one of our jointly organized activities, the "Fostering User Engagement for Innovative Demand Response For Effective Flexibility" workshop, the opportunity arose to compile this Open Letter. According to the European Commission's definition: *"Open letters are short, peer-reviewed articles discussing policies relevant to a broad research community, presenting guidelines or white papers, or announcing new initiatives. An Open Letter should usually represent the views of a Horizon 2020, Horizon Europe and/or Euratom project or group of projects; publication does not imply endorsement by the European Commission. An Open Letter should not include new data and analysis (if it does, a Research Article may be more suitable). The decision whether an Open Letter meets these criteria and is suitable for publication and subsequent peer review ultimately lies with the Editorial Director."* The ultimate objective of the paper is to publicly exchange information, sharing best practices and challenges identified during the different activities undertaken in our projects. By doing so, we aim to provide interested stakeholders with a valuable resource, akin to "on-the-field" literature or guidelines that can be applied to their respective projects, without the necessity to delve into technical details. Building upon this objective, please find below our concrete responses to your comments and suggestions:

- *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.*

Response: the projects we discuss in the Open Letter are inherently different, representing diverse fields and stages of development. As these projects are ongoing and have not concluded, the inherent diversity poses a challenge in presenting a unified and coherent vision at the point the Open Letter was written. Nevertheless, we appreciate your suggestion and strived to provide as much cohesion as possible within the given context.

- *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.*

Response: we appreciate your feedback regarding the perceived superficial approach in presenting results. As per the open letter definition, the inclusion of new data and analysis is discouraged. However, in response to your valuable recommendation, we have enhanced clarity by incorporating examples and referencing the respective projects' deliverables. For a comprehensive understanding, readers can access the complete description of strategies and/or results through the provided link [Search H2020 sister project collaboration on consumer engagement for demand response (zenodo.org)] both in this letter and within the Open Letter. We believe these additions will provide the necessary depth and context for interested parties.

- *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?

Response: we appreciate your insightful suggestion regarding the proposal of a methodology for customer engagement. However, as we have tried to justify, proposing a methodology was not initially foreseen for our Open Letter. Your recommendation, though valuable for future endeavours, is not within the intended approach for this specific document. Nevertheless, we have taken your feedback into consideration and, as a response, improved the conclusions section. Additionally, we have added practical insights for interested stakeholders, reflecting the recruitment and engagement strategies that are being found most effective in the corresponding projects (albeit quantification of their effectiveness is still lacking). We hope these enhancements address your concerns and contribute positively to the document's overall value.

- *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.

Response: while we acknowledge the perception that the work may appear survey-like, it is crucial to clarify that this is not a survey but an open discussion involving projects working in the same field. The intention is to foster an exchange of best practices and insights. As for your suggestion about a unified methodological approach, we must emphasize that proposing a methodology was not initially envisioned for our Open Letter. However, your recommendation is duly noted for future considerations. To address concerns about the presentation style, we have enhanced the document by providing additional context, examples, and references to deliverables, aiming to create a more comprehensive and insightful resource for our readers. We hope these improvements contribute to a richer understanding of the collaborative efforts outlined in the Open Letter. **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.

Response: Thank you for your feedback. Please, be aware that projects are still in progress, and it has not been determined yet what is effective and what is not. Nevertheless, examples and links to the relevant deliverables reports and journal papers have been added.

- *"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 Response: Acknowledging your concern, we recognise that the information offered in the text regarding archetypes, characterization, and prevalence in each country is limited. The initial development of archetypes employed a qualitative methodology, and we plan to collect quantitative data at the project's conclusion to assess the effectiveness of our customized approach. Regrettably, we are unable to present this data within the constraints of an Open Letter. To provide interested readers with a more in-depth understanding, we have directed them to the deliverable. This document offers insights into the methodology used to identify archetypes, detailed descriptions of each archetype, and an exploration of how the recruitment strategy was adjusted based on the benefits sought and the technological readiness of each archetype.

- "*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?

Response: The section has been updated to include some examples of activities that have run in the pilots. Also, a link to the deliverable that fully describes them has been added.

- "*identity confirmation (to project or self-confirm an early adopter identity or an environmental identity)"*

This sentence should be better clarified. Response: The sentence has been rewritten following your suggestions so that it is clearer for a wider audience (section 2.7). 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. Response: We have rewritten the paragraph to better describe the symbolic and monetary incentives used (section 2.7.). Unfortunately, when the Open Letter was written, we had no data to elucidate the influence of each type of incentive on consumer engagement. This is an aspect that will be assessed at the end of the project.

- "*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?

Response: Yes, it is realistic. They are dynamic entities by the very nature of how they operate. Energy communities must continually negotiate with different actors across multiple scales of government, as well as operate within often changing financial and commercial environments. In addition, they must take into account social and political factors in their respective countries.

- "*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?
Response: The sentence has been rephrased to address this feedback.

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. Response: we appreciate your observation. It is essential to note that the projects under discussion are at various stages of execution. The responses presented in the Open Letter are derived from the outcomes of the conference and workshop. Our intent was to adhere closely to the responses shared during these events. Consequently, not all projects were able to provide answers to specific questions due to inherent time constraints during the event. We acknowledge this limitation and hope that the context provided enhances the understanding of the document's scope and content.

Competing Interests: No competing interests were disclosed.