

Best Practice Guidelines for Engaging Citizens in the Pilots and Metrics for Diversity and Inclusion

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Best Practice Guidelines for Engaging Citizens in the Pilots and Metrics for Diversity and Inclusion

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Statement of Originality

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Summary

This report, Deliverable 2.1- "Best practice guidelines for engaging citizens in the pilots and metrics for diversity and inclusion", provides an introduction to the TwinERGY Project, shares co-design methodologies, the process by which a community engagement framework was co-created with the TwinERGY Pilot leads, KWMC and IFC, and best practice guidelines for citizen engagement in the project.

As this document focuses on community engagement, it should be recognised that, due to the global Covid-19 pandemic, the internal and external meetings, workshops and events that previously would have been held in person, have been carried out on-line. The framework takes into consideration that engaging with people in the Pilot cities may be carried out virtually or in person according to government recommendations at the time of the activities.

A host of tools have been designed for use throughout the project, these are described further alongside guidance in how to use this report. Some reflection on the development of the framework is given and what follows is discussed in the conclusion.

Index

VERSION HISTORY	3
SUMMARY.....	5
INDEX	6
LIST OF TABLES.....	8
LIST OF FIGURES.....	9
1/ INTRODUCTION.....	10
1.1 Scope.....	10
1.2 Methodology.....	11
1.3 Target Audience.....	12
1.4 Structure	12
2/ COMMUNITY ENGAGEMENT FRAMEWORK.....	13
2.1 Best Practices.....	13
2.1.1 In house/Living Lab expertise.....	13
2.1.2 Co-creation.....	13
2.1.3 Multi-method approach.....	13
2.1.4 Real-life setting.....	14
2.1.5 Multi-stakeholder participation.....	14
2.1.6 Active user involvement.....	14
2.1.7 Bristol Approach	15
2.2 Guidelines for Participatory Engagement.....	18
2.2.1 Guiding Principles for TwinERGY.....	19
2.2.2 Processes	20
2.2.3 Approaches.....	20
2.3 Guidelines for Equity, Diversity and Inclusion.....	22
2.3.1 Introduction to Equity, Diversity, and Inclusion (EDI)	22
2.3.2 EDI and TwinERGY.....	24
2.3.3 EDI Matrix Table	26
2.4 TwinERGY Engagement Framework.....	29
2.4.1 Why a shared framework across pilots.....	29
2.4.2 TwinERGY framework, Bristol Approach adapted	29
2.4.3 Training Materials and Tools.....	33

3/ PROCESS	36
3.1 Pilot Interviews	36
3.1.1 Workshops with the Pilots.....	37
3.2 Pilots needs and context.....	38
3.3 Individual Pilot strategies.....	38
3.3.1 Persona Cards.....	38
3.3.2 Scenario Cards.....	41
3.3.3 Pilot Engagement Timeline.....	43
3.4 Iteration: How to use this document.....	44
4/ CONCLUSION	45
4.1 Energy efficiency technology and Community Engagement.....	45
4.2 What is next?.....	46
5/ REFERENCES	47

List of Tables

Table 1. EDI TwinERGY Engagement Framework Matrix	26
Table 2. KWMC-IFC Interviews with Pilots.....	36

List of Figures

Figure 1. Tips and Tricks Cards.....	15
Figure 2. The Bristol Approach.....	15
Figure 3. Bristol Approach Identification & Framing of an issue, workshop and event.....	16
Figure 4. Ladybirds co-designed as part of Step 3, Bristol Approach.....	16
Figure 5. Sensors deployed as part of step 4 of Bristol Approach	17
Figure 6. Showing step 5 of the Bristol Approach, orchestration	17
Figure 7. Data postcards as an outcome, step 6 of Bristol Approach.....	18
Figure 8. Excerpt from WEF Toolkit.....	23
Figure 9. The three elements common to all the pilots and the associated engagement activities	29
Figure 10. The TwinERGY engagement framework, adapted Bristol Approach.....	32
Figure 11. Phase 1 of the pilot timeline template.....	35

1. Introduction

Energy Citizens, Co-designing a Framework for Community Engagement

The notions of citizen empowerment and social engagement are closely intertwined. Citizens, as consumers of energy are often left with few options in regards to the choices they have in the purchase and consumption of energy. The TwinERGY project sets out to change that, the following is an excerpt from the original project bid:

'Consumer Empowerment stands as a major target and challenge that needs to be addressed for a successful outcome. Consumers need and are willing to be transformed to active energy market players, towards reducing their energy bills, decarbonizing the grid and tackling energy poverty. Social engagement and consumer appreciation are considered among the most important lessons learned from other projects... The understanding of what matters to consumers is considered a determining parameter for project success and is expected to remain relevant after the project completion and the commencement of the commercialization phase.'

1.1 Scope

The development of best practice guidelines for community engagement for citizens for the TwinERGY Horizon 2020 project is necessary to facilitate and standardise the engagement activity across the four Pilots. As cited above, social engagement, working with citizens (consumers) is critical for a successful project, and will lead to citizens that are further empowered and potentially act as a driver for a more democratic energy market. Each Pilot will implement innovative TwinERGY technology in their cities and communities. Communities, in this context refers to the local people who are involved in the project. In some Pilots, this will be a small geographic area, within other Pilots people may be spread across a city.

The TwinERGY Project has been developed to address the gap in technology and understanding between citizens, who may also fall into the energy prosumer category, and energy markets by creating a Demand Response Framework. This will incorporate digital intelligence with human intelligence so that people can be active in adapting their consumption of energy to have less environmental impact whilst using data and automation. This can demonstrate a better energy ecosystem which is more democratic.

The purpose of this deliverable is to: provide a document which Pilots can refer to throughout the duration of the TwinERGY project to check their methods, acting as guidance and as a

benchmark for participatory engagement; providing tools co-created for the Pilots to utilise in designing and carrying out engagement activities in their local communities; and to aid Pilots in the process of iteration, testing and dynamically adjusting methods to meet the needs of their citizens.

The role of the deliverable is to provide this framework and guidelines near the beginning of the TwinERGY project pilot implementation (Month 8 – June 2021) so that the Pilots will have a socially engaged, co-design approach to carrying out activities with their citizens. Developing the framework and guidelines has also been a co-design process, carrying out interviews with each pilot and conducting workshops with training materials to prepare each pilot to undertake engagement with a foundation in engagement practices. Task 11.3 (Citizen Learning & Dissemination) of the process will capture the learning from each pilot site on the engagement activities they undertook which will be captured in Deliverable 11.5 (Citizen Learning activities/events and report) and Deliverable 11.6 (Consumer Engagement Handbook).

1.2 Methodology

The way in which the participants experience the project, getting involved, participating in activities, being part of co-designing and improving the technology should be easily accessible, straightforward, and enjoyable. Throughout the duration of the project, and with the deployment of TwinERGY devices in dwellings where people live and/or work, participants should be able to engage with these devices, the Pilot leaders and each other to foster understanding of the technology as well as to identify ways that the experience of using them could be improved through social innovation.

As the TwinERGY project kicked off in the midst of the Covid-19 pandemic, internal project meetings as well as external facing events, have primarily been carried out virtually in the initial 6 months.

Knowle West Media Centre (KWMC) and Ideas for Change (IFC) have introduced and adapted methods of co-design including the Bristol Approach¹ to the TwinERGY context. The process of developing the framework began with interviews with each pilot and continued with training sessions in participatory engagement after taking into consideration the individual needs of each Pilot (Germany, Greece, Italy and UK) alongside the overarching aims of the project. The following workshops covered equity, diversity and inclusion, these are key to developing technology that is useful for everyone, not a select few. Taking into account that the energy sector is changing rapidly and the efficiencies being developed have cost implications as well

¹ <https://www.bristolapproach.org/bristol-approach/>

as the potential to reduce the impact of climate change, involving as broad a segment of the population in TwinERGY research may ensure that demand response models will be more robust than if only tested on a homogenous group.

1.3 Target Audience

The target audience of this document is the European Commission, the TwinERGY project Pilots, and others who would like insight into the Community Engagement Framework for TwinERGY.

1.4 Structure

The rest of this document covers the design and development of the Community Engagement Framework for TwinERGY, with best practices, the guidelines for participation and the matrix for EDI (Equity, Diversity and Inclusion) which underwent a co-design process with the Pilots, KWMC and IFC.

2. Community Engagement Framework

Community Engagement, Co-design and Technological Innovation

2.1 Best Practices

The TwinERGY project benefits from considering the best practices in community engagement in projects which involve new forms of technology. KWMC has in-house expertise, and has also developed resources with partners leading in this field including ENOLL² (the European Network of Living Labs) and Ideas for Change. Working with Ideas for Change on Task 2.1, a previous methodology, the Bristol Approach, has been further iterated to specifically address the TwinERGY project with its aims and the four Pilots. More detail on Living Lab methods, another example of best practices: Tips and Tricks for Responsible Research and Innovation (Figure 1), The Bristol Approach and the adapted version for TwinERGY follows.

2.1.1 In house/Living Lab expertise

KWMC began over 25 years ago in the community of Knowle West and has served the area with creative arts-based engagement practice. As a member of ENOLL, KWMC is Bristol's Living Lab. The practice is underpinned by: co-creation, a multi-method approach, using a real-life setting, multi-stakeholder participation and active-user involvement. Using Living Lab practices in the development of new technology may positively impact the process as well as the results.

2.1.2 Co-creation

KWMC is a place where citizens, artists, technologists, academics, business, and public sector organisations come together to co-create ideas, tools and technologies that address local challenges, to innovate and to explore new possibilities.

2.1.3 Multi-method approach

KWMC uses socially engaged arts and participatory design approaches to deliver digital social innovation. Methods and tools are co-designed with local people, national and international

² The European Network of Living Labs: <https://enoll.org/>

networks, organisations, academics and individuals with expertise in relevant fields. They include the Bristol Approach; a 6-step framework with a City Commons at the heart of it (a pool of community managed resources) that helps groups to tackle the pressing issues in their community. KWMC: The Factory is an innovation space for prototyping, making, digital fabrication and product design.

2.1.4 Real-life setting

Communities and their needs are central to the work of Bristol Living Lab. KWMC has over 25 years of experience of working in Knowle West, a neighbourhood of approximately 20,000 people in South Bristol, that features high in the government's deprivation indices. Our focus is to ensure the inclusion of individuals and groups at risk of social and digital exclusion, and support them to become active citizens with equal access to the city's opportunities. KWMC work in partnership with community anchor organisations across Bristol to engage other communities in Living Lab projects.

2.1.5 Multi-stakeholder participation

KWMC facilitates collaboration between communities, business, research and education, and public administration. KWMC has developed strong relationships and built up trust with individuals, groups, and organisations. Projects are funded and commissioned by a wide range of government, voluntary and public sector organisations, from local groups to national organisations, and Bristol Living Lab is an active participant in European projects.

2.1.6 Active user involvement

KWMC is a community based 'enabler-driven' living lab: KWMC acts as a 'broker' between citizens and organisations, ensuring that each participant is able to contribute their knowledge and experience to a project. It has an 'action research' approach, where continual reflection and evaluation are built into the working process, and this enables them to be flexible and responsive to the changing needs of partners and communities. Co-creation is a cooperative process whereby people with a common interest, often with diverse skills and experiences, work together non-hierarchically towards the same aim or change they want to bring about.



Figure 1. Tips and Tricks Cards

KWMC worked with ENOLL in 2020 to develop 20 Tips and Tricks for Responsible Research and Innovation (available here: <https://padlet.com/enollorg/TipTrickRRI>) which can also act as prompts and provocations to challenge and inspire organisations when planning community engagement activities in TwinERGY. The full set of cards were developed using the European Commission’s thematic keys for Responsible Research and Innovation: Learning/Science Education cards are blue, Inclusivity focused cards are green, Openness cards are red, and Collaborative/Societal engagement cards are yellow.

2.1.7 Bristol Approach

Knowle West Media Centre and Ideas for Change worked with Bristol City Council to develop the Bristol Approach for Citizen Sensing (Figure 2) in 2016.



Figure 2. The Bristol Approach

The Bristol Approach has the following steps, some photos of previous project are shown as examples of the Bristol Approach in action below.

Step 1. Identification: identifying the key issue you want to address and the change you want to bring about

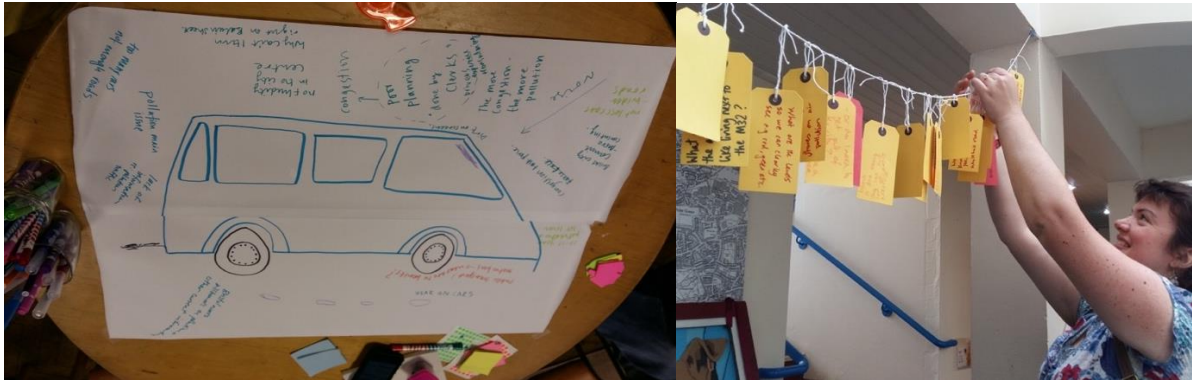


Figure 3. Bristol Approach Identification & Framing of an issue, workshop and event

Step 2. Framing: looking at the issue in more detail and exploring how you could harness the power of technology and data to address it

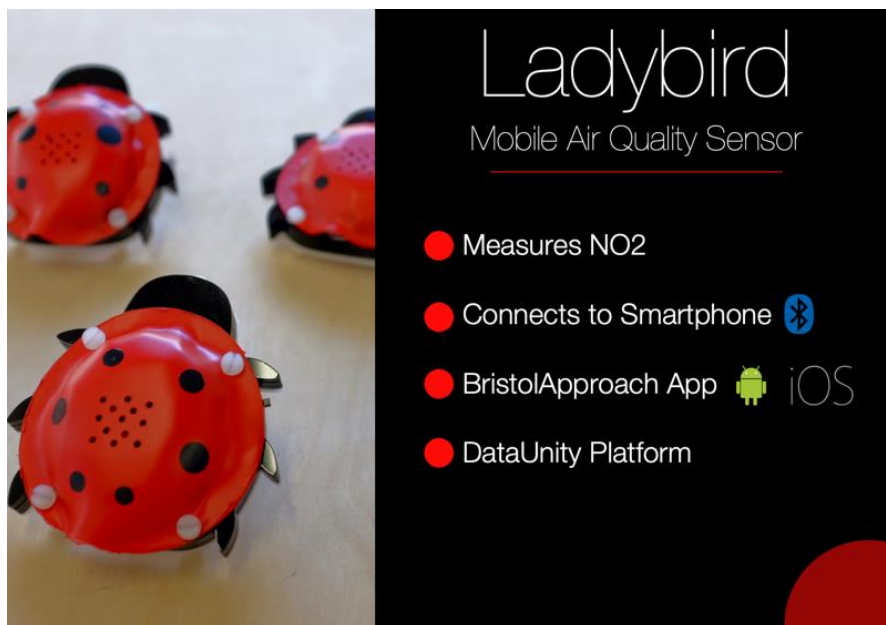


Figure 4. Ladybirds co-designed as part of Step 3, Bristol Approach

Step 3. Design: creating any tools you'll need to help you gather data or understand the issue further

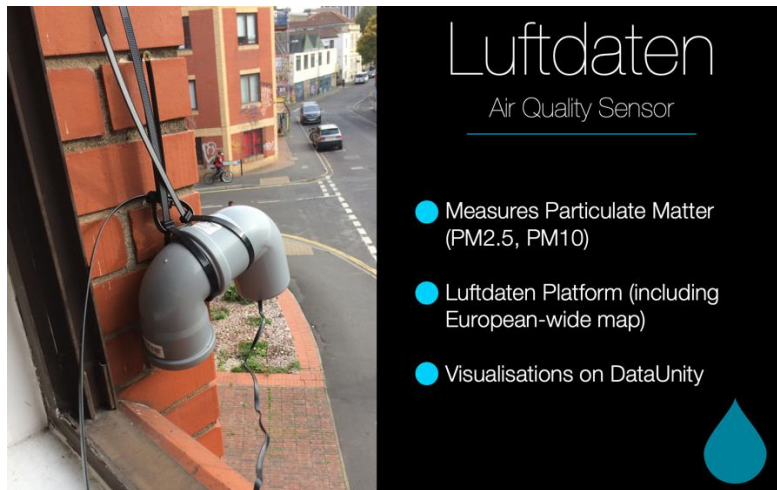


Figure 5. Sensors deployed as part of step 4 of Bristol Approach

Step 4. Deployment: testing the tools in a ‘real world’ environment



Figure 6. Showing step 5 of the Bristol Approach, orchestration

Step 5. Orchestration: sharing the tools and data with others and celebrating what you have achieved



Figure 7. Data postcards as an outcome, step 6 of Bristol Approach

Step 6. Outcome: evaluating whether you have achieved your goals

The Bristol Approach has been tested and utilised in European Commission Horizon 2020 funded projects such as [REPLICATE](#). The photos above are examples of the Bristol Approach being used with an issue identified by a community of people in East Bristol, air pollution. This strand of work in REPLICATE, fell under the "Created By Us" workstream, which focused on how citizens could use smart city technology as the architects of change, as opposed to having technology solutions coming from the top down. The Bristol Approach has also been used (and further iterated) in ParCos and UK funded research projects such as [RESPIRES](#) and ECOSCIM. It has also been used in public health projects (see Nobles et al, 2020) continuing Professional Development (CPD) sessions for the Landscape Institute (UK) and the International Federation of Landscape Architects (IFLA) have used the Bristol Approach to train urban designers and landscape architects in this co-design methodology (IFLA 2019).

2.2 Guidelines for Participatory Engagement

To ensure effective citizen engagement within TwinERGY, will require an active and intentional dialogue between the pilot partners and the people participating in the project (e.g. people in the homes and offices where the project is deployed). For this to be effective requires a common understanding of what citizen engagement is and involves, and a shared understanding of the terminology used across all pilot sites and consortium partners. Therefore, the Guidelines for Participatory Engagement outlined here cover; the guiding principles, processes within engagement and methodological approaches to engagement.

Prior to working on TwinERGY, KWMC was a partner on the Horizon 2020 funded REPLICATE project which focused on implementing Smart city technology in three Lighthouse cities, one

of which was Bristol. Leading on citizen engagement in Bristol, and working with the University of Bristol on related ethnographic research, it was necessary to clearly define concepts relating to participation and engagement, especially for partners who were focused on the technology. One of the learnings from REPLICATE was that it was important to clearly define concepts around participation and engagement, especially for project partners who had a technology or engineering focus, as these disciplines often focus less on people. Using the learning from that project we have created guidelines and definitions for these concepts so that TwinERGY partners can refer back to them throughout the duration of the project to check their methods and consider whether they are actively using citizen engagement and co-design approaches in their work and pilot deployments.

2.2.1 Guiding Principles for TwinERGY

1. **Collaboration:** we recognise that trialling a digital twin for energy, involving the deployment of technology (including smart meters and wearable devices), should be carried out in collaboration with ordinary citizens to inform the process, as currently most such research projects focus on working with 'early adopters'.
2. **Multiple voices:** we recognise a need to take into account multiple voices, interests and expectations at every stage of the work - in particular those who are currently most excluded. Our methodology specifically addresses inclusion and diversity. We are developing metrics to ensure that multiple voices are heard and that project partners (Pilot leads) aim to meet people where they are, instead of replicating traditional hierarchies. We acknowledge that each Pilot may have unique cultural and socio-economic backgrounds and aim to include citizens effectively in each city/area.
3. **Power:** we acknowledge that traditional methods of citizen engagement often reproduce positions of power (Hofstede Power index), for example re-creating a very hierarchical relationship with experts, academics, or city officers put in the position of leading an engagement session. We work to challenge these hierarchies by changing the tone, atmosphere, and when possible, the physical environment of activities to design and hold a more egalitarian space. Additionally, in projects such as REPLICATE, community champions were involved, who were able to relate to other local people from the community (an example shown in [this video](#) from the REPLICATE project).
4. **Experimental and Collective:** we commit to an experimental ethos (where possible), politically committed to collective learning, and doing and acting together.

2.2.2 Processes

Recruitment: the process of actively seeking out and finding people to participate in the project. This includes the creation of materials (potentially physical and digital) such as flyers or announcements to invite people to get involved in the project. In some settings (*e.g.* where a University is leading) the recruitment process cannot begin until it has been assessed and approved by an ethics committee. This often involves a target number (*e.g.* homes or participants.)

Engagement: the process of interacting with and developing relationships with people. There are a number of engagement approaches including consultation, involvement and co-design (see Approaches).

Participation: actively taking part in something that is happening. The participant's level of influence and autonomy - their power to create an outcome they desire - will depend on the kind of project they are participating in.

Collaboration: working with people to achieve an outcome or goal that all parties want. Successful collaboration recognises that everyone is an 'expert' in their own way – for example architects understand building, local residents understand the needs of their neighbours and street.

2.2.3 Approaches

Research: asking people for their views or to take part in activities in order to find out the answer to a question or hypothesis and/or provide greater clarity about an issue. Research is often conducted to aid the achievement of a larger goal, such as to address inequality, promote healthy lifestyles, increase employment, or to find out 'what something is like'.

e.g. what kind of sports provision is available in South Bristol?

Market research: asking people for their views and opinions about something to assess the viability and/or popularity of a paid-for product or service. Market research is usually a one-off, one-way interaction and is often conducted through face-to-face (including via Teams or Zoom) interviews and questionnaires.

e.g. would people in South Bristol be interested in a sports club membership?

Participatory research: planning and conducting research processes *with* the people whose lives are under study. Participatory research is often conducted in order to create change in society, on the basis of insights obtained through this collaborative research between academics, practitioners, and citizens. Participatory research involves establishing a

relationship with participants over a period of time, leading to a co-produced outcome. It could involve focus groups, regular meetings and a series of interviews.

e.g. how can communities shape and influence the provision of sports facilities in South Bristol?

Consultation: asking people for their views and opinions about something that is likely to affect their day-to-day lives, often before the activity begins. Consultation is often undertaken about proposals, developments or activities that could be delivered in a number of ways, such as building works and structural changes. The subject of the consultation isn't necessarily something the person has identified as a priority and they may not have been involved in shaping the proposal, development, or activity.

e.g. where do you think the new sports facility in South Bristol should be built?

Involvement: allowing people some input into how something is delivered. For example: providing an opportunity for people to make decisions about one aspect of a larger activity (which they do not control).

e.g. what should the logo for the new sports facility look like?

Co-design: working with people, from the very beginning of a process, to decide what should happen, how this should be achieved and why it is important. Co-design processes take into account everyone's needs and priorities and often begin with a very loose topic or series of aims, which are agreed and revisited as the process progresses.

e.g. what do you think are the biggest issues, challenges or opportunities facing South Bristol? [this may or may not result in sport being a priority]

or

how can we support people in South Bristol to live healthier lives / take part in sport? [note that this question pre-supposes that the person will think healthy living / sport is a priority]

Citizen Sensing: a process where citizens build, use, or act as, sensors – for example, identifying and gathering information (or 'data') that will help them to tackle an issue that's important to them. This sensing process could involve creating a bespoke temperature sensor from scratch or using a piece of technology that already has an in-built sensor, like a smartphone. However simple or complex the technology, and whatever the data being gathered, citizen sensing is about empowering and enabling people to use technology for social good.

2.3 Guidelines for Equity, Diversity and Inclusion

2.3.1 Introduction to Equity, Diversity, and Inclusion (EDI)

The importance of carrying out engagement activities that consider equity, diversity and inclusion cannot be understated. Generally, there are 'early adopters' that participate in technology and energy projects, they frequently come from affluent backgrounds, and may also be involved or work in the industry (for example, in the Sunshine Tariff project in Cornwall most of the participants were from wealthier backgrounds than the average income/employment status in the area, Western Power Distribution, 2017). Increasing grassroots level engagement and involvement in technology projects can help to address the structural inequalities that exist in society.

These are the definitions used for equity, diversity and inclusion in this document.

Equity: Ensure that everyone has access to the same opportunities, barriers exist at different starting points. Equity commits to correct and address the imbalance.

Diversity: Different identities include those people most impacted by oppressive systems based on disability, classism, racism, gender bias and ableism - and as a result of this are often underrepresented – will be represented.

Inclusion: Valuing the thoughts, ideas and perspectives of people with different identities.

Innovations in technology need to be designed for everyone, not only because of the need to level inequalities, but also because better designed technology will ultimately be more successful than technology that only functions for a small segment of the population.

The World Economic Forum, WEF, recently published "Diversity, Equity and Inclusion 4.0, A Toolkit for leaders to accelerate social progress in the future of work"³, which shares insights such as the chart below showing the increase in productivity related to diverse teams. In addition to productivity, they cite profitability and innovation increases with diversity. The report also recommends a pro-active approach in regards to managing new technologies for diversity, equity and inclusion. Transparency around data and how privacy concerns are addressed is highlighted as is the suggestion to report on the diversity of the teams that produce technological tools. Making participation in innovative technology projects as inclusive as possible may have far reaching benefits, not just on diversifying a project team,

³ (http://www3.weforum.org/docs/WEF_NES_DEI4.0_Toolkit_2020.pdf)

but in the co-creation of tools which will benefit more people than technology designed by a homogenous group. Figure 8 below shows the positive impact of diversity on team performance.

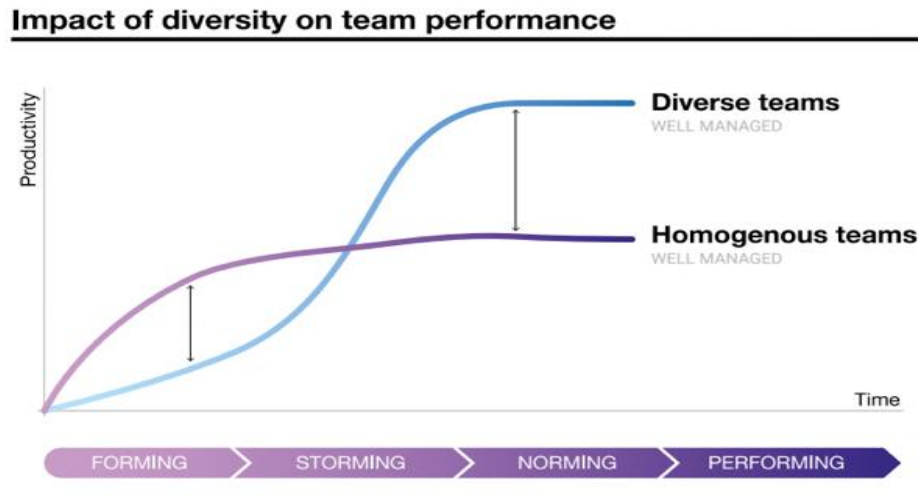


Figure 1: Impact of diversity on team performance
Source: Korn Ferry Institute, 2019

Figure 8. Excerpt from WEF Toolkit

The (WEF, 2020) toolkit, says that companies that are more diverse, inclusive and equitable are “performing better than their market average across a wide range of key performance metrics:

- Profitability: 25%-36% more likely to outperform on profitability
- Innovation: Up to 20% higher rate of innovation and 19% higher innovation revenues
- Decision-making: Up to 30% greater ability of spotting and reducing business risks”

This highlights that implementing good EDI practice is not only good for creating a more equal society, but it makes financial sense too. As there continue to be gaps in research and innovation, specifically relating to gender⁴, an inclusive approach to community engagement in projects like TwinERGY can be important in challenging these gaps by encouraging women as well as men to participate. The project also aims to involve households in social housing, instead of only homeowners who may have more economic means to get involved easily. Diversity needs to increase at all levels, whether from the level of citizen participants who get involved in innovation projects, to the team leading the project. An oft-quoted term is “If you can’t see it, you can’t be it.” If as a society we aim to increase and improve diversity, equity and

⁴ 2019 EC Factsheet:

https://ec.europa.eu/info/sites/default/files/research_and_innovation/knowledge_publications_tools_and_data/documents/ec_rtd_factsheet-gender-equality_2019.pdf

inclusion at all levels, we need to have examples which people can follow, as well as create environments which people from a variety of backgrounds will be comfortable attending.

Raising awareness of the gaps and committing to address diversity and gender equality are ways in which organisations can begin the process of strategic change.⁵ In the workshops carried out with the Pilots, training tools (including the matrix), and documents, care has been taken to distil the key information and share it using simple language to communicate these issues. Other EU funded projects such as [RIDE](#) have identified the need for training to increase diversity and equality for project leaders to translate into better project delivery. And recent research evaluating DSR trials also shows that some groups like women and disabled people may experience negative impacts such as paying higher costs for electricity or by generating additional unpaid work from participating in energy research trials if they are not designed for inclusivity (Crawley et al, 2021 a) The Matrix has been developed to be used as a measure for pilot leads to utilise prior to planning or carrying out engagement activities.

2.3.2 EDI and TwinERGY

Creating engagement activities that help to increase awareness and understanding of energy systems, infrastructure and technological innovation is important to widen the participation in energy research. In the development of the TwinERGY guidelines for EDI, a table matrix (Table 1, below) was created to clearly highlight the areas of importance to consider for planning and carrying out engagement activities. This was developed after initial meetings with the four Pilots when we had gained some understanding about the demographics of the potential participants in each area, as well as taking into consideration previous experience of delivering engagement activities.

Discussions with the Pilots showed a range of understanding about EDI and how it may apply. As TwinERGY is an energy and technology project, focusing on innovation around digital models and demand side response, we discussed the learning from previous projects and similar studies and found that some themes tend to arise. These include a tendency to carry out projects like this with more affluent people who may already be interested in energy, the households that participate are often owners rather than those in rented properties (Western Power Distribution, Sunshine Tariff Report 2017). Increasing access to energy systems and infrastructures can increase energy justice, in turn acting as a lever for action and mobilising communities (Jenkins et al 2021.)

⁵ Achieving gender equality and promoting diversity in the European audiovisual sector
<https://www.equalitydiversityinavsector.eu/>

Recent research from (Crawley et al, 2021b), shows that the implementation of demand side response can impact lower socio-economic groups differently according to whether the response is manual or automated. If it is manual, it can disproportionately affect women, who still do the majority of the household chores. Considering the way in which women are engaged as well as if there are potential ramifications of an intervention which affect one gender more than another is important at the beginning of a project. Addressing these imbalances in the co-design process could result in further innovation or iteration on a tool that helps to make shifting energy use easier for everyone.

Another aspect to consider when implementing demand side response research with a diverse array of household participants considering, is whether the level of energy use prior to taking part was particularly high or not. Considering issues around energy justice, shifting demand from those using higher levels might be a consideration (Chatterton et al 2016) People on lower incomes, or those experiencing higher levels of deprivation, often use less energy than households with higher income levels *e.g.* [The Converging World](#) created an interactive map showing energy use as well as installation of renewable energy which covered the Bristol Area. Additionally, those on higher incomes may already have, or be considering, electric vehicles which could play a role in demand side response. With TwinERGY, considering who can participate, to what extent, with what technology that may already be in the home or be installed as part of the project is also an important consideration.

Creating a space in the city commons: a pool of community-managed resources (Balestrini et al 2017) - in which it is possible for local citizens to be part of the energy transition is a step in influencing energy justice and energy democracy. The commons which is created for engaging with people about TwinERGY may be digital and/or physical, making certain that either space is a place which is easy to use for people who have disabilities including neurodiversity. The use of language will be different in each country as each pilot will be carrying out activities and communications in the local language used, however using language that is not complex, and limiting acronyms is necessary in all languages. One way to design communications for simplicity is to consider whether the language is accessible for a 12 year old, meaning that the language may address some complex concepts, but not at the level of a higher university degree in engineering. Carrying out accessible engagement activities in TwinERGY can facilitate increased understanding of the energy system, as well as agency in the development of solutions, and may influence individual behaviour change.

The Matrix for EDI was developed after meeting with each of the Pilots and assessing the demographics of people in the study areas. Although each of the Pilots has differing levels of diversity, for example, there are still ways that engagement can be tailored to attract a range of people from different backgrounds and be inclusive.

The matrix was shared in the second engagement workshop to help prompt Pilots in considering EDI even early in the planning stages. Some questions were utilised in the Miro timeline activity as well.

2.3.3 EDI Matrix Table

The EDI Matrix of the TwinERGY project is shown below (Table 1).

Table 1. EDI TwinERGY Engagement Framework Matrix

Citizen Engagement Framework Area	Questions		Yes/No/Consider and explain
Engagement			
DIGITAL/VIRTUAL	Is the information regarding engagement events/workshops designed to be easily read (e.g. font, colour, font size?)		
	Is engagement event information available in local language in analogue and digital formats?		
	Is this information directed towards: a) Household b) Head of household c) Renter/owner d) Resident?		
	Is the engagement platform accessible?	Smartphone and computer/tablet? IoS and Android?	
PHYSICAL	Is the engagement space accessible and welcoming for everyone?	Socially distancing? Indoors/outdoors? Risk-assessed space? Health and Safety – hand sanitizer, clarity	

Citizen Engagement Framework Area	Questions		Yes/No/Consider and explain
		on numbers of attendees	
	Can people of any age and ability enter the space?	Wheelchair/mobility-impaired/pushchair accessible?	
	Are there Covid-safe toilets which are disable accessible available?	Accessible Toilets?	
	Is the (indoor or outdoor) space designed to accommodate people with a hearing impairment and/or visual impairment?	Accessible for visually/hearing impaired?	
Recruitment & Participation			
If already recruited, what did your Pilot do to ensure the process was fair, accessible and encouraging to local residents?			
How do you address gender (see below)?			
How do you address age?			
How do you address learning disabilities/neurodiversity?			
Activities			
Facilitators – are they relatable/connected to the community?			
Is there a gender mix in those who deliver talks, activities, etc?			
Data			

Citizen Engagement Framework Area	Questions	Yes/No/Consider and explain
	Are there data sharing agreements which participants understand?	
	Is there understanding of the privacy of the household data collected for TwinERGY?	
	Will there be data visualisation (or gamification) making it easier to understand for participants?	
	Is the flow of data asymmetric, if yes, what are you doing to balance power dynamics? E.g. are there mechanisms to compensate participants for using their data? Can you communicate the value (social) returns?	

This checklist should be used at the beginning of the project, as well as throughout the project to document the process reflection and iteration.

Gender is an aspect of the TwinERGY project:

Within TwinERGY it is acknowledged the importance of promoting gender balanced participation on the project in order to ensure that both men and women are represented at every step of the project. Thus, this project will mainstream gender equality in all its activities, including at a project management level. This includes equality, non-discrimination, participation, empowerment and accountability. Engagement materials and tools will take into account the gender dimension assuring a gender neutrals language. Besides that, all TwinERGY events, including the Pilots implementation activities will have a gender balance. Gender aspects will be of main importance in the development of WPs, where Workshops with citizens 'representatives' will be held. During the recruitment of these partners, special efforts will be made in order the percentage of women/men recruited to be balanced. This way, special needs and expectations of both genders, if they really exist, will be detected and covered in the proposed solutions.

Although gender has been explicitly addressed in the development of the project, the aspiration is to beyond this and increase representation of groups with protected characteristics e.g. ethnic minorities, disabled people including neurodiversity, and a range of ages participating.

The above checklist is designed to prompt reflection and support the pilots to iterate and adapt their methods. Other issues and areas may arise which are not included in the checklist currently, this document will be updated during the course of the TwinERGY project as

necessary.

2.4 TwinERGY Engagement Framework

2.4.1 Why a shared framework across pilots

A shared engagement framework aims to act as a lingua franca for consortium partners allowing to i) assist pilot leaders in the process of planning the pilot activities, ii) discuss pilot interventions in a cohesive manner and iii) aid the analysis and some levels of comparison across pilots.

2.4.2 TwinERGY framework, Bristol Approach adapted

In order to respond to the specific characteristics and needs of the TwinERGY pilots, we propose an adapted version of the Bristol Approach that builds on the guiding principles presented above (sections 2.2, 2.3), and sheds and expands the Design and Deployment phase of the Bristol Approach (section 2.1) to include elements specific to an energy-related project focused on Demand Response.

The adapted framework has been developed following interviews with pilot leaders (see section 3.1), which contributed to highlighting the commonalities and differences among the four TwinERGY pilots.

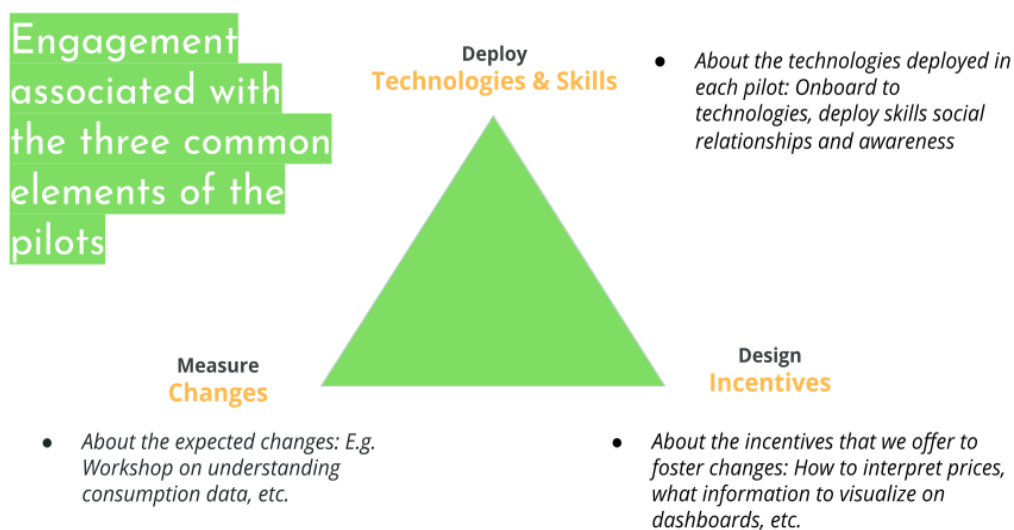


Figure 9. The three elements common to all the pilots and the associated engagement activities

We have identified three elements, shown above in Figure 9, that are common to all the pilots. Each of these elements has an associated strategy for citizen engagement. These elements are:

Technologies

Each pilot will deploy a set of technologies in people's homes and/or their local communities. These may range from smart meters, electric vehicles and chargers, apps, web platforms, solar panels. Different expertise and skills are required by citizens to understand, use and make the most of these technologies. Looking at the needs of each pilot to trial new technology and systems around energy use, it became apparent that once the specific technologies have been identified, these will need to be implemented using soft skills, social relationships to get participants onboard. Once using these new technologies, there may be the opportunity to optimize the technological tools with direct feedback from participants who may have ways in which to improve the tools to make them easier to use, more accessible or otherwise. Also, at this stage it is interesting to reflect on and acknowledge citizens' capabilities: all pilot participants are 'expert' in their own way. For instance, they can install or set up parts of the technologies.

In terms of engagement, at this stage it is important to develop activities aimed at supporting the development of technical skills and data literacy in the participating community. Examples of activities to be implemented to meet this goal could be:

- activities aimed to design the technologies with pilot participants, gather their opinion and inputs during the design phase of these technologies (e.g. workshops for co-designing technologies functionalities of user interfaces, usability tests)
- training sessions to show how to install, set up and use the technologies
- training sessions on energy related concepts
- mapping participant's capabilities and skills
- workshops on data literacy and governance

Incentives

In a Demand Response scheme, different incentives are provided to people to influence their behaviours and change their energy consumption. These can draw upon personal motivations, economic incentives or community goals. Each pilot will be testing different types of incentives. Examples are: dashboards that provide real time information, pricing dynamic signals, gaming points at individual or community levels, etc. How do participants react to different types of incentives?

In terms of engagement, it is important to ensure that the incentives we aim to develop are

meaningful for participants and are designed and communicated in a correct way. For instance, we may want to use public displays or web platforms to tell participants the number of Kwh saved in the last month. What information should be visualized that is understandable and meaningful for the most and motivate them to change their consumption?

Examples of activities to be implemented to meet this goal could be:

- co-creation workshops to design incentives
- evaluation sessions and group discussions

Changes

The ultimate goal of introducing technologies to people's home and providing different types of incentives is to foster more sustainable energy consumption and bring positive changes to participants' lives. How does this translate into people's everyday lives? What concrete outcomes can they expect? For instance, reduction in their energy consumption, saving in energy bills, new revenues or reduction in CO2. Having an expectation of the outcomes beforehand, helps to communicate to participants the benefits of getting involved in the pilots. In addition, there might be other types of outcomes, such as personal learnings, new social relations, etc.

In terms of engagement, it will be valuable to measure changes that happen, whether behaviour change from participants or in energy usage. In planning this stage of the pilot, we should reflect on how we make participants aware of the change that occurred, how we measure it and we involve participants in doing so. Possible activities to conduct could be:

- Workshop to understand changes in individual consumption data during the pilot period
- Workshop to understand different amounts of consumption and comparison with other pilots

Including these three elements into the Bristol Approach will result in an adapted version that looks as follows (Figure 10):

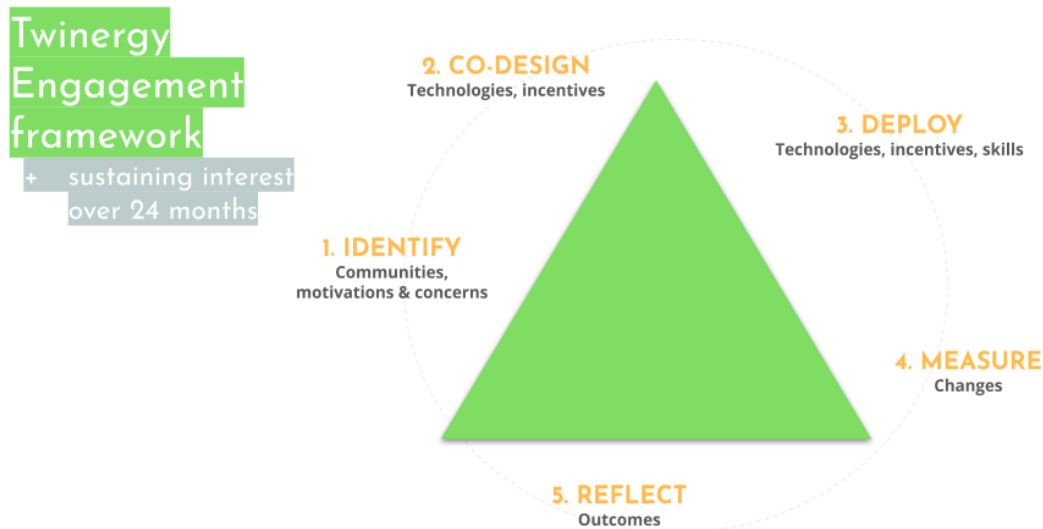


Figure 10. The TwinERGY engagement framework, adapted Bristol Approach

Step 1 Identify: refers to the identification of the community to be engaged in the pilots, taking into account the EDI principles above. Once the community has been set up, it is important at this stage to identify the goals and issues that the community has identified in relation to using tools from the TwinERGY system.

Step 2 Co-Design: refers to including participants' inputs and feedback in the design phase of the TwinERGY technologies and proposed incentives. Co-designing and getting input from participants will help to maintain engagement in the project over 24 months. As the system elements, as well as community needs, differ for each pilot, these will be unique to each pilot, though there will be overlaps, for example in UC9 with the digital twin.

Step 3 Deploy: the technology and incentives co-designed in step 2 will be deployed in each of the pilot communities. This stage includes installing and setting up technologies at people's home and community centres, as well activities aimed at deploying skills among pilot participants so that they are able to use and make sense of the TwinERGY technologies.

Step 4 Measure: By following a co-assessment approach, this stage includes activities aimed to involve pilot participants in the assessment of the changes brought by TwinERGY technologies – is it energy shifted (DSM)? Awareness? Engagement? What intervals?

Step 5 Reflect: At the periods of measuring, an initial phase of reflection will be carried out and utilized to iterate the next phase, improving engagement and delivery.


2.4.3 Training Materials and Tools

In order for the framework to be actionable, KWMC and IFC have developed a set of tools aimed to guide pilot leaders in planning their pilot interventions and foster reflections on guiding principles. These tools were tested in online workshops (28 April and 11 May) with the pilots. These workshops involved presentations given by members of KWMC and IFC about best practices, EDI principles, and the engagement framework. Pilots were given the following documents:

- KWMC-IFC Engagement Approaches Definitions Adapted for TwinERGY
- EDI TwinERGY Engagement Framework

Persona Cards

Prompting the Pilot leaders to consider who their 'average' participant is, persona cards were created. The different fields of age, gender, education level, profession as well as the motivations and technical skills require an in-depth process of reflection, verifying that the participants may or may not be like those leading the pilots. Acknowledging that some participants may already be tech-orientated and keen to decrease energy use and/or their impacts is useful, but it is also important to recognize that there is value in having participants from different, less tech-savvy, not affluent backgrounds as well.

	<p>Persona Card</p>		
<p>Name</p>	<p>Imagine what the average participant in your project is like? Or a composite of a few people.</p>		
<p>Age</p>	<p>Person age</p>	<p>Profession</p>	<p>What is her work or expertise?</p>
<p>Gender</p>	<p>Female/Male/etc</p>	<p>Educational level</p>	<p>Maximum educational level achieved</p>
<p>City</p>	<p>Name the city where this person lives</p>	<p>Community</p>	<p>Is she part of a community? Did she already participate in other kinds of projects?</p>

Motivations	Tech skills
-What their motivations or interests in general and/or related with the project	-Name her tech skills. Keep in mind that this can be from sending messages via whatsapp to being active in social media, etc.

Scenario Card

The Scenario Card helps pilot leaders to imagine the situations that a participant could experience over the course of the pilot - the motivations that foster him/her to join, the technologies that he/she will be using and the changes accomplished. The scenario card is created by combining elements of the persona cards and TwinERGY engagement framework.

Scenario card
Maria lives in *Bristol/Steinheim/Benetutti/Athens*.
She joined the TwinERGY pilot in her city because she ... Choose the personal motivation / incentives. E.g. save money / help the project or the community / energy independence / curiosity/ help the planet / other...
Maria is using ... Choose the technologies that have been deployed in Maria's home/building? Smart meters / PV battery / electric cars / wearables / others
After one year of pilot, she realizes that ____ , Describe the expected change and how Maria realizes that the change has happened? Less consume of energy / Better understanding of her consumption / Change in her daily operations (e.g. when setting up the washing machine)

Pilot timeline

The pilot timeline is a representation of key activities to be conducted over the course of the pilot. It aims to help pilot leaders to have an overview of the entire pilot in advance, in order

to support the general organization and identify and anticipate possible pain points. The pilot timeline is structured around the 5 steps of the TwinERGY engagement framework (Figure 11). For each phase, it includes questions aimed at fostering pilot leaders to reflect on the EDI principles and anticipate which kind of communication activities they should implement at pilot site in order to keep participants motivated and informed of the pilot progress.

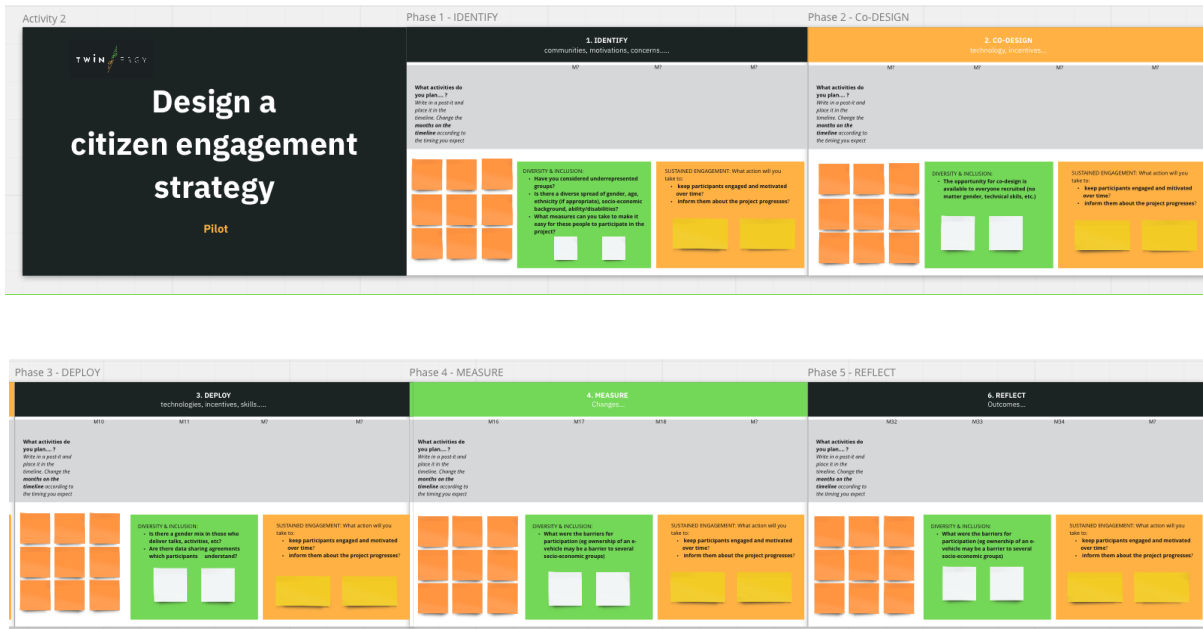


Figure 11. Phase 1 of the pilot timeline template

3. Process

Energy efficiency technology and Community Engagement

The process to share best practices as well as create a framework for engagement has been carried out working with the Pilots. Taking into consideration the type of technology being used according to the Use Case Scenarios as well as the variable demographics of each Pilot, the framework has been developed to keep co-design at the heart of the project. Engaging citizens in the process of innovation, in co-designing new technology can help democratize the energy system.

3.1 Pilot Interviews

KWMC and Ideas for Change held a series of interviews with each Pilot (Table 2) to find out what the baseline was for the planned TwinERGY related engagement activity and deployment of technology. This included assessing the Use case scenarios as well as what pre-existing conditions for engagement were in each of the communities.

Table 2. KWMC-IFC Interviews with Pilots.

Date	Pilot	Planned Use Case	Community Connections in place
24 March 2021	Greece	1,3,6,8,9	No
24 March 2021	Italy	1,2,4,5,6,7,8,9	Yes
25 March 2021	Germany	1,2,3,5,7,8,9	Yes
1 April 2021	United Kingdom	1,2,4,7,9	Some

These meetings established the commonalities as well as the differences across the Pilots and how the Bristol Approach could be further adapted to meet the needs of the Pilot. The interviews revealed that Pilots had different levels of connection to their communities before the start of engagement activities. Some Pilot leaders were already embedded in the area, others were located nearby but not in the communities. The knowledge of the communities varied as well, for example whether Pilot leaders were already aware of special considerations of the participants (e.g. if they must own an EV) or had participated previously in similar

projects. As one of the project aims is to open up participation more broadly, all Pilots could gain from further implementation of co-design in community engagement.

3.1.1 Workshops with the Pilots

As mentioned in the previous section, **workshops were carried out to share best co-design and community engagement practices as well as the EDI Framework. These online workshops involved presentations and break out rooms with activities.**

Each Pilot has begun the TwinERGY project with a different level of requirements for engagement. Some Pilots were already embedded in their communities, with participants recruited beforehand, others needed to secure research ethics approvals with their institutions before engagement of participants can commence. The need to effectively engage with participants for 24 months will be the same across the board, though depending on use case scenarios and the actual deployment of technology, the ways this engagement is conducted will probably be different in each Pilot. A few bullet points from each interview are shared below.

German Pilot learnings

- Project team is already engaged with community, also proactively disseminating information about TwinERGY and energy in the wider community.
- One of the team is embedded in the community.
- Running workshops online.

Greek Pilot learnings

- Project team has connections to community but is not yet engaging with community.
- Project team is located in a nearby geographic area, but not embedded in the community.
- Considering strategy for participation.

Italian Pilot learnings

- Project team has already recruited participants in the community.
- Team members are embedded in the community.
- Considering strategy for participation.

UK Pilot learnings

- Project team has connections to community but is not yet engaging with community.
- Project team is located in the area, but specific geographic parameters have not yet been set.

- Considering strategy for participation.

3.2 Pilots needs and context

Each of the four pilot sites in TwinERGY has a unique set of characteristics, whether cultural dimensions (e.g. Hofstede index), societal or otherwise (rural vs urban) which will influence the needs of the Pilot leads in carrying out citizen engagement in their community. Each is also implementing a range of different TwinERGY use case scenarios. KWMC and IFC held interviews with each pilot, and in online workshops, led small groups discussion to work with pilots regarding the needs for their individual pilot projects. As mentioned above in section 2.4, Pilots were given the task of completing persona cards and scenario cards. In addition to the persona and scenario cards, each Pilot was instructed in how to use Miro, a web-based resource which is a visual tool that facilitates collaboration, to use an engagement timeline developed by IFC. The timelines have prompts to help the pilots consider the engagement activities they will carry out and align with the adapted Bristol Approach for TwinERGY.

3.3 Individual Pilot strategies



During the first workshop held with all of the Pilots, we carried out an activity to work with them on developing their persona cards. Using composites or examples of people who might participate, these cards help to identify what further areas to consider in developing engagement activities which are bespoke for local communities. The scenario cards which follow were designed and developed along the same principles to prompt pilots to carefully consider the backgrounds and motivations of their participants.

Screenshots or copies of the persona cards for each city follow. Scenario cards were designed along the same principles, and examples of them are shown in section 3.3.2.



3.3.1 Persona Cards

The following activity cards have been merged, please follow the colours codes relevant to the names assigned for each persona card.



Germany

 Angelika		<h1>Persona Card</h1> Germany		 Andreas	
Age	65	Profession	Master (craft)		
	35		Farmer		
Gender	Female	Educational level	Master's Degree		
	Male		Vocational training education		
City	Steinheim	Community	Part of the Hagedorn community		
	Steinheim		Community of Hagedorn		
Motivations		Tech skills			
<ul style="list-style-type: none"> - likes Johannes - saving money - environment 		<ul style="list-style-type: none"> - likes Johannes - saving money - environment 		<ul style="list-style-type: none"> - medium tech skills 	
				<ul style="list-style-type: none"> - medium tech skills 	



Greece

 Eve		<h1>Persona Card</h1> Greece		 George	
Age	32	Profession	Product Developer in the Energy Section		
	45		Janitor		
Gender	Female	Educational level	Master's Degree		
	Male		Highschool		
City	Athens	Community	Already familiar with similar projects and solutions		
	Athens		Not connected to a community		
Motivations		Tech skills			
<ul style="list-style-type: none"> - Learning, enhancing her knowledge in the Energy field - Environmental friendlier lifestyle choices - Cost Reduction 		<ul style="list-style-type: none"> - Cost Reduction - Simplification of knowledge transfer and applications to be used. 		<ul style="list-style-type: none"> - Tech savvy, active in social media, excel phreak, access in several portfolio analysis tools. 	
				<ul style="list-style-type: none"> - Not very active in social media - Basic knowledge of apps and use of smartphones and computers 	

Italy

 Persona Card 	
Italy	
Age	<i>18</i> <i>70</i>
Gender	<i>Female</i> <i>Male</i>
City	<i>Benetutti</i> <i>Benetutti</i>
Motivations	<ul style="list-style-type: none"> -Interest in scientific an innovative project - Proud of her city involvement in research projects - Ecology motivation
Tech skills	<ul style="list-style-type: none"> - Social network - WhatsApp - Telegram - Mail - SMS - Online platform

UK

 Persona Card 	
UK	
Age	<i>Late 50s</i> <i>30-40s</i>
Gender	<i>Female</i> <i>Male</i>
City	<i>Bristol</i> <i>Bristol</i>
Motivations	<ul style="list-style-type: none"> -Wants to do more -Environmentally conscious -Participated in SOLAA (may have)
Tech skills	<ul style="list-style-type: none"> -Not very tech-orientated -More tech usage in past year, she has learnt a lot -Can sue Facebook, WhatsApp, Email

<p><i>had some bad experiences)</i> <i>-Family, future proof</i> <i>-Mixed message from news – wants to learn more</i></p>	<p><i>family support</i> <i>-Eco status recognition</i></p>		<p><i>advocate and automation</i></p>
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3.3.2 Scenario Cards

Germany

<p>Scenario card</p>
<p>Johannes lives in * Steinheim *.</p>
<p>Personal motivation: He joined the TwinERGY pilot in his city because he wants to save the environment and likes to try new technologies. Therefore, the TwinERGY approach is a big playground to try out environmental friendly technologies for him.</p>
<p>Technologies: Johannes is already using a PV-System, Smart meters, PV-battery, electric car, heat pumps, home energy management systems (blind control, heat pump control, charging control, battery storage control)</p>
<p>Change: Johannes has learned that he contributes to 1/3 of Hagedorns RES, the other project participants are using his RES energy surplus for different operations. He likes supporting the village. He has educated the villagers in terms of sustainable energy technologies and usage. He is a role model for many people.</p>

Greece

<p>Scenario card</p>
<p>Eve lives in Athens.</p>
<p>Personal motivation: She joined the TwinERGY pilot in her city because she would be thrilled to learn more about energy services and dig deeper into this field. Apart from that she is also interested in the environment and actively chooses an appropriate lifestyle.</p>
<p>Technologies: Eve is using IoT devices related to energy services such as LED Lights, Smart plugs</p>

and Temperature Sensors.

Change: After one year of pilot, she realizes that not only she has gained a better understanding of how Demand Response Schemes work, but also adopted energy efficient tips to further reduce her energy consumption and her bills.

Italy

Scenario card

Claudia lives in **Benetutti**.

She joined the TwinERGY pilot in her city because she ...

- Wants to help the project
- Wants to help the planet
- Wants a city CO2 free
- Is curious

Claudia is using ...

- Smart meters
- Smart plugs
- Wearable devices

After one year of pilot, she realizes that.

- She achieved a better understanding of her consumption
- She discovered she was following some consumption patterns just because she was used to it.
- She knows her CO2 impact avoided

UK

Scenario card

Maria lives in **Bristol**

She joined the TwinERGY pilot in her city because she ...

- Has been involved in a similar project and enjoyed the community aspect/connecting with people
- Wants to save money
- Is curious

Maria is using ...

- Already has solar PV
- May respond to visual/physical (e.g. glow orb idea) reminders of real time information, basic technology implementation
- She wants to optimise her home appliance use (e.g. messages saying it is ok to leave her washing in the washing machine)

After one year of pilot, she realizes that:

- She can leave her washing in the machine until the optimal time to run it, she has a new routine now
 - She achieved a better understanding of her energy consumption and it has decreased
 - She compares notes with a neighbour who is also involved in the project

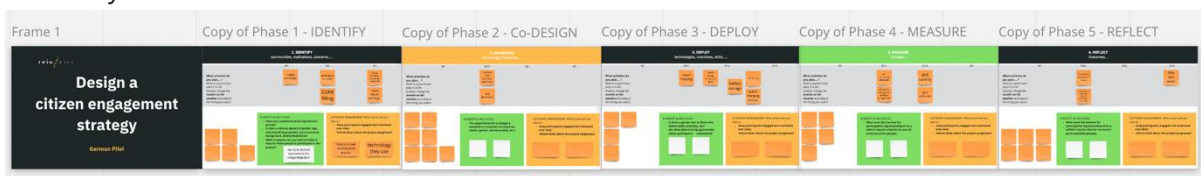
3.3.3 Pilot Engagement Timeline

Screenshots of the new timeline in late May, 2021 were made of each of the Pilots engagement timelines. These are shared for each Pilot.

The objective of the timeline activity was to highlight that engagement is an ongoing process. When deploying technology, it is important to consider that participants may need some hand-holding throughout the process, and it is necessary to connect with people multiple times during a long-term intervention. The timeline also provides a visual tool to plan activities and adapt as necessary share progress.

These timelines are likely to be updated, and planning will also evolve with developments in technology. The images below are included for reference, though too small to interrogate, please use this [link](#) to access the interactive timelines.

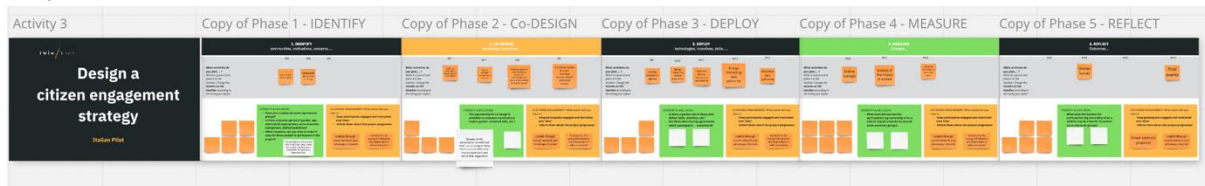
Germany



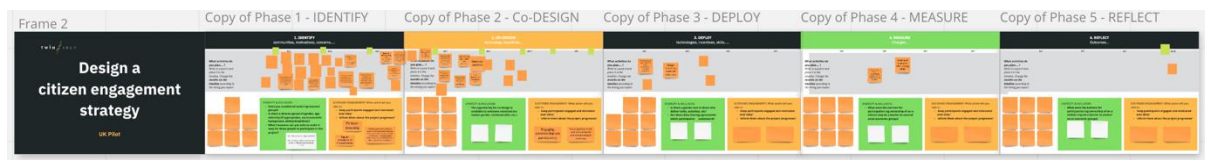
Greece



Italy



UK



3.4 Iteration: How to use this document

This document is designed to be easily accessible and utilised by Pilots through the duration of the TwinERGY project. The Framework has been designed to aid in planning and delivering community engagement. The tools (Matrix, Engagement Approaches and definitions, and the Miro timelines) developed for the Community Engagement Framework may be updated and adapted during the TwinERGY project.

4. Conclusions

4.1 Energy efficiency technology and Community Engagement

This document shares the process and results of co-creating a community engagement framework for the TwinERGY project. It began with outlining best practices and in-house expertise in co-design methodology. The interviews with each of the TwinERGY pilots were essential to understand what the baseline was for each community prior to developing a methodology bespoke for the project. Carrying out workshops with the pilots to work through engagement planning as well as address equity, diversity and inclusion further contributed to this framework document and the EDI Matrix. The timelines which were developed are interactive and may be updated throughout the project with more detailed information.

Reflections

The creation of the Community Engagement Framework involved using co-creation methods whilst working with the Pilots and Ideas for Change. Gathering the experience and knowledge of the Pilot leaders who know their citizens and communities has been important in developing these guidelines. As each pilot has begun from different recruitment and engagement baselines, we have created guidelines which will have a benefit regardless of which point in the engagement process they are used.

Covid-19 Impacts

The interactions with all members of the TwinERGY consortium up to this point (May 2021) have been carried out virtually, due to Covid-19 restrictions and guidance. Had the pandemic not influenced the project, there may have been physical meetings as well as fact-finding missions to visit the Pilots, gaining insight from spending time in the communities where the pilots will take place. Despite the fact that no visits were possible during this period, meetings were possible online, and Pilot leads were able to convey their local community and the ideas, thoughts and concerns they had about engagement.

4.2 What is next?

This deliverable will be accessible for the Pilots for the duration of the project. The tools that have been developed were also designed for use throughout the project, continually checking and iterating, if necessary, to improve the engagement process.

The Miro Timelines will be available online: https://miro.com/app/board/o9J_IFMnveY=/. The continued work on engagement in each of the pilots will need to be closely integrated with the development and deployment of technology. The relationship between the technology, the community and the process of co-design requires investment of time and maintaining connections to the different stakeholders and citizens, as well as holding the space for creative innovation.

The work captured in the present document is closely linked to WP12 and WP11. In Task 12.4 of TwinERGY, KWMC is working with Ideas for Change and the Bristol Pilot partners to develop data use licenses to deal with data sharing, use and storage. These build upon the work the University of Bristol is doing around research ethics and GDPR for the Bristol Pilot and the license will be developed in collaboration with the pilot participants. It offers a creative way to engage with local people around making choices on how they share their data as part of the project. KWMC and Ideas for Change will be bringing in previous experience and learning from other projects such as REPLICATE. The data use license will be used in the Bristol pilot and shared with the other three pilot sites.

Task 11.4 is focused on capturing Citizen Learning and Dissemination and will follow on from Task 2.1 and this deliverable. It will specifically focus on engagement with citizens and the sharing of learning from the four pilot studies. The activities will be co-designed with the pilot participants to ensure that they meet local needs and the activities are inclusive and accessible for a range of ages and ability levels. The aim is to capture content focused on learning from the engagement activities (e.g. articles, podcasts, videos, social media content etc) to share and to run small local and regional events to disseminate the learning. One of the deliverables from this task is a consumer engagement handbook, led by Ideas for Change which will provide an update on the guidance provided in this report and learning based on its implementation within the TwinERGY pilot studies.

5. References

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