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ABSTRACT

The goal of the Intergeneration learning task under DECIDE project has been to

understand how much can intergenerational learning be used to increase awareness and foster behavioural change.

To this end, the Power of Community game has been developed, aimed at kids of age 6 to 12. The Power of Community game has been designed to explain nature and use of renewable energy, such as PV and wind and to bring closer the concept of renewable energy community. The game is publicly available and provided with instructions in nine languages.

Total of over 500 sets of game have been sent to 28 schools or institutions working with children and project partners in 12 countries.

In addition, there are colouring books, pins and similar communication material to foster discussion and encourage playing of the game at home between children and their caregivers. Four different strategies have been developed to encourage caregivers to provide feedback regarding their awareness, motivation and willingness to become active in regard to sustainable energy and energy communities.

The Power of Community game has shown to be:

- Engaging for various generations of players.
- Versatile for workshop organizers/educators/game instructors to adjust the level and detail of explanation of sustainable energy and energy communities to different types of players.
- Ideal for informal educational activities within schools or family settings.

The game encourages intergenerational learning from caregivers to children, while the effects of reverse effects of intergenerational learning cannot be conclusive from the data collected within this DECIDE project activities until the 31st of May 2022. During 2022 and 2023 additional data will be collected within DECIDE project activities. In addition, <u>Horizon 2020</u> project Energy Citizens for Inclusive Decarbonization (ENCLUDE) project will build on the results and activities of DECIDE project.



Figure 1: Greek 2022 workshop.



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INTERGENERATION LEARNING MATERIAL

WHAT IS INTERGENERATION LEARNING?

Intergenerational learning is a process of exchanging knowledge, experiences, and values between different generations [1,2]. Traditionally, much of intergenerational learning happens in informal way and it is a bidirectional process from one generation towards another and vice versa [2]. Intergenerational learning can be within family [1-6] or within groups of different generations [1,7], and can have various benefits. Intergenerational learning can be from parents/caregivers to children or from children to caregivers.

The benefits of intergenerational learning within the family are improved transfer of knowledge and traditions, healthier relationships between the family as a whole, solidified individual and collective identity formation, and increased social cohesion [2]. The benefits are to individual, to family but also to society as a whole, as it increases potential for social change and understanding of global issues [2]. Additional societal benefit includes more inclusive and sustainable society [7].

Intergenerational learning is not a new topic. However, in the past two decades the benefit of providing informal educational activities to children that would act as actors of change or modification in the caregivers/parents behaviour has been explored [1-6]. Martins et.al. [1] screened 3,796 articles published from 2008 to 2016 to assess the differences in studies addressing intergenerational learning. Studies have shown that through intergenerational learning children can have influence on different perceptions and actions of their parents such as purchasing habits, energy related behaviours [4], waste related behaviours, flood related knowledge [5], views on modern technology [2], views on sexual orientation [2], etc.

The effects and success of intergenerational learning from child to caregiver depends on a few aspects, including parental styles [4], child's age and gender [4], child's confidence and the sense of empowerment with the new knowledge [2,3]. The effectiveness of the (informal) educational activity to be successful in transferring the knowledge to the child and making it interesting for the discussion with parents has been directly related to how interactive and hands on the activity is [1,2,3,5] and how much action-oriented solutions are provided to the children [3,5,6]. The research shows [3] that children will discuss more the content than the activities that are included in the educational activities that they were involved in. While some research shows that the change in behaviour of both children and their families is still present weeks after the educational activity [3], some show that the change in behaviour has short term effects, for example household energy consumption [6].



Intergenerational programs use educational programs, art, information technology development, cultural heritage, health education, and therapeutic activities¹[1].

This report focuses on the intergenerational learning within the family triggered by informal educational activities with children during workshops or school related events. The intergenerational learning addressed in this report is mainly from children (6-12) to the caregiver, in most cases defined as the adjacent generation caregiver. The informal educational activity developed within the DECIDE project is the Power of community game. The game has been designed to be played by the children or with children and caregivers in school or at workshops. In addition, a take home small version of the game has been designed to encourage intergenerational learning at home.



Figure 2: Children playing the Power of Community game during Greek workshop in 2022.

¹ Intergenerational materials are used for interfamily learning or for increased cohesion between different generations in the society.



ABOUT THE POWER OF COMMUNITY GAME

The Power of Community is an independent, educational board-game launched in 2021 within the framework of the DECIDE project. It has pioneered a new concept in children's games about energy, providing kids with an immersive, fun piece of knowledge. The game encourages children to tap into their imagination and use their creativity to learn how the energy system and renewable energy works, it is here to amplify their voices. It has at the core of its offering a passion for clean energy and sustainability.

Its goal of this task is to understand

how much can intergenerational learning be used to increase awareness and foster behavioural change.

Increase awareness

Improving the sustainability of processes doesn't start when you are an adult. To protect the environment and mitigate disaster risk and climate change we have the responsibility to talk about it with all the generations.

To achieve increased awareness the game itself had to be simple, utterly clear, and practically useful. Further, visualisation of energy concepts close to everyday life activities and explanation of when PV and wind provide energy, the role of the DSO and energy community, etc. all provide for the basis for increasing the basic knowledge of the participants. Definition of a good board game is a game that gets played.

Behavioural change

The psychological foundation of behaviour change consists of three ingredients: capability, motivation, and an opportunity to do so². With the Power of Community game, we address the **motivation** aspect.

² Based on the COM-B model from © 2011 Michie et al; licensee BioMed Central Ltd. An Open Access article distributed under the terms of the <u>Creative Commons Attribution License</u>.





Figure 3: Behaviour change: the psychological foundation presented during DECIDE Work Package 1 Seminar Series on the 5th of May 2022.

Schools and institutions working with kids can order the game free of charge after filling in a short questionnaire available on-line on the <u>game website</u>³. It arrives at their place in an envelope with <u>simple to follow and illustrated instructions</u>. Everyone is invited to join an on-line <u>questionnaire</u> before and after playing the game. Both, the instructions, and the questionnaire are available in nine languages (Estonian, Green, Polish, Spanish, Dutch, German, French and Italian).

Below "Five Steps" explanation of the process we use as a pitch when offering the game to schools and institutions:



STEP 1.

Order DIY kits of the game for your school or organisation here.

³ The game website address <u>https://thepowerofcommunity.space</u>











STEP 2.

We will ship one *mini* version of the game for every kid participating. That's why we ask you to tell us how many kids there are to play the game. For our research we aim at a group of 20-40 kids per EU member state and from six to twelve years old. The information sheet is provided to explain the research topic and purpose.

STEP 3.

After playing the game in school students can take the *mini* version of the game home and play it with their caregivers. This is what we hope could happen, since we've designed this game to encourage children-caregiver dialogue about sustainable energy and principles of renewable energy communities.

STEP 4.

We hope the game will inspire an exchange about renewable energy and lead to a dialogue.

STEP 5.

In the end we would like to ask caregivers a few questions so we could measure if the exchange between them and the children increased awareness and inspired change in the behaviour. We have it available online, in your local language, see the example in English here: <u>questionnaire to</u> <u>fill in</u>.



GAME INSTRUCTIONS STEP BY STEP



WHERE TO START?

There are four players (or four teams) in this game. From the available four identity cards each player picks one card. The players or teams are spread to four different locations, such that there is some distance between them. Later they need to run (for example through a specified route with obstacles) to each other to exchange cards.



 WHO IS WHO? WHO PRODUCES AND WHO CONSUMES? School with PVs: 5 production points, 3 consumption points Old buildings: 0 production points, 2 consumption points New buildings with PVs: 2 production points, 3 consumption points Toys factory with windmill: 5 production points, 4 consumption points 	
	THE DISTRIBUTION SYSTEM OPERATOR It's time to meet the Distribution System Operator ⁴ (place the black card in the middle).

⁴ "What does the Distribution System Operator (DSO) do?" in case the caregivers are not sure what to reply we provide simply put explanations on the "FAQ" section of our website: <u>thepowerofcommunity.space/faq</u> so it supports directly raising the awareness.



RED CONSUMPTION CARDS

The Distribution System Operator distributes **red Consumption Cards**.

If you have 3 consumption points you get 3 red consumption cards.

For example, the Toy Factory uses a lot of machines. Each machine equals one red card. The red cards represent some machines or activities that need energy.

They can be allocated to match the characteristics of the identity cards (for example the machines go to the toy factory), or the players can select what they like.

WHAT'S THE WEATHER TODAY?

Is it sunny or is it rainy today? We will check the weather app. The Distribution System Operator tosses smartphone cards with the following options:

SUNNY and NO WIND: For each yellow point you get one yellow Energy Card.

CLOUDY and WINDY: For each blue point you get one yellow Energy Card.

SUNNY and WINDY: For each yellow point you get one yellow Energy Card. For each blue point you get one yellow Energy Card.

CLOUDY and NO WIND: You get no energy cards.















WE WIN! When we manage to cover all our red Consumption Cards, we win the game! You will quickly notice it when the weather app shows it's sunny and windy at the same time. We can now put our yellow Energy Cards together and we can give an assignment to the Distribution System Operator. Pick one assignment from the pile. If you liked the game, feel free to play another round! Re-distribute the identity cards and start over.	
	PUT THE ENERGY CARDS TOGETHER FOR SOME EXTRA FUN! See the Energy Monsters drawn on the Energy Cards? Use your imagination to describe what you see. It's like electricity: it's there, because your machine works, but you can't see it! Good luck and have a lot of fun!



GAME CONTENT OVERVIEW

Figure 4 on the right visualises all the cards needed to play the game. Each game is shipped in a square envelope with a QR code leading to a multilingual page with instructions currently including nine languages.⁵



Figure 4: All the cards needed to play the game.

⁵ Further reading: <u>https://thepowerofcommunity.space/instructions</u>



GAME DESIGN AND DEVELOPMENT IN STAGES

The game has been developed and improved in five stages, which were also non-linear: Empathise, Define (the Problem), Ideate, Prototype and Test.



Figure 5: Game design development in an non-linear process. Adapted from Interaction Design Foundation with copyright licence: CC BY-NC-SA 3.0.

Empathising: Understanding the human needs involved

Throughout the process we have been consulting teachers and their students through observing, engaging, and empathizing with them to understand their general experiences with energy and motivations, as well as immersing ourselves in the school's environment so we could gain a deeper understanding of the students' reality.

With the information gathered in this stage we used it during the next stages to develop the best possible understanding of those who will be involved in playing the game.



Defining: Re-framing and defining the problem in human-centric ways.

Next, we analysed our observations and synthesised them to define the next steps. Throughout the process we were bringing back our focus to a product which should be human-centred and easy to understand.

To illustrate, instead of providing long explanations of what a Renewable Energy Community is (and what it is not) we managed to create a set of simple cards where everything is explained visually.

In this stage we often asked ourselves a question

"How can we encourage young audience to perform an action that benefits them and also involves their caregivers?"

Ideating: Creating many ideas in ideation sessions.

During the third stage of the process, we generated first ideas.

Fe have focussed on understanding our users and their needs in the **Empathise stage**, and we have analysed and synthesised our observations in the **Define stage**. With this solid background, our team of interdisciplinary experts including energy consultants, EU public affairs manager and a communication designer was able to "think outside the box" and identify new solutions to the initial question:

How much can intergenerational learning be used to increase awareness and foster behavioural change?

Prototyping: Adopting a hands-on approach in prototyping.

When we kicked-off this project internally with Th!nk E team in 2021 we were not allowed to meet in person. Miro App⁶ was used to prototype and test the first ideas. Our goal in this stage was to produce inexpensive, scaled down versions of the product, so we could investigate further development.

First set of quick prototypes was tested internally with Th!nk E team. The second prototyped version was shipped to the DECIDE Project consortium members in a form of a DIY kit printed on A4 home printer. The pages needed to be cut and made into the game. We have recorded a step-by-step instructions movie which was published on <u>DECIDE website</u> as well as on <u>YouTube</u> and shows the process in a fast-forward manner⁷ which takes 1 minute and 21 seconds. The preparation of the game took to the first tester 20 minutes in total, which we

⁶ More about Miro app here: miro.com/app/

⁷ Further viewing: decide4energy.eu/media-page?uid=1012 or www.youtube.com/watch?v=RyWT2O4kCnY&t=3s



immediately realised would be a barrier for our target audience, taking note of it for the final product design.

The solutions were implemented within the prototypes, and, one by one, they were investigated and either accepted, improved, and re-examined, or rejected based on the users' experiences.

Testing: Developing a testable prototype/solution to the problem.

On the 21st September 2021 we tested the game in a school in Sterrebeek, a multilingual region of Belgium. It was played with 45 kids during 3 sport classes. For this workshop we have built a bigger version of the game so it could be played together in teams of 3-4.

The workshop is further explained in detail below in section called "Workshops in

Belgium, Sterrebeek, 21st September 2021".

By the end of the Testing stage, the communication designer had a better idea of the constraints inherent to the product and the problems that were present as well as a clearer view of how the kids behaved, what they thought, and what they felt when interacting with the product.

At this stage we have also realised how difficult it was to motivate the caregiver's involvement to play the game as well as fill in the questionnaire which has been sent to them after playing the game, which remains a challenge of this Task. The questionnaire is essential to monitor the Task results, yet completion remains under 7,8%⁸.

The non-linear nature of the process

We may have outlined the design process in a linear fashion, however, in practice, the process was carried out in a more flexible and non-linear manner. For example, different groups within the DECIDE consortium have conducted more than one stage concurrently, or the designer have collected website analytics information and prototype better dissemination tools during the entire length of the project task as well as to bring the ideas to life and visualise the possible solutions.

Also, results from the testing phase have revealed some insights about users, which in turn lead to another brainstorming session (Ideate) or the development of new prototypes (Prototype).

To illustrate, in 2021 we have received feedback from DECIDE consortium members who played the first version of the game with their kids. Among the remarks, it was flagged that

⁸ Based on an estimation that by 31th of May 2022 500 individuals have played the game and we have by date received a total of 50 responses to the questionnaire on-line.



3D elements were too difficult to store after the game was played. In 2022, another DECIDE consortium member preparing their workshops (described in detail in section called "Workshop in Figure 14: Belgian 2021 workshop in Sterrebeek.

Greece, Glyfada, 13th April 2022") asked specifically for the prior removed 3D models, since these would create additional layer to what they have planned to do.

Even though the Intergeneration learning was foreseen to be completed by end of 2021, the process of game distribution and collection of the data was continued into 2022. This is mainly because most of the project partners could not organise to play the game with the children in school due to COVID-19 restrictions.



Figure 6: An example illustrating non-linear design process which was fit-to-purpose: 2022 Greek workshop using 3D elements which we decided to remove from the game in 2021 since these were difficult to store and distribute.

In our design process information was continually used to create new solution spaces, and to redefine the problem(s). This created a loop, in which the designer continued to gain new insights, develop new iterations of the end-product while developing a profound understanding of the users and the problems they face.



TWO FINAL PRODUCTS

In essence, because of the iterative process, we developed two fit-for-purpose products determined by the way users play the game:

Mini version: two to five players in a private setting

for 2-5 players, in an informal setting, like a home or youth movement facility. The mini version of the game is shipped in an envelope and doesn't contain 3D objects. This version can be easily ordered on-line, free of charge⁹. In 2020 when we started this task there was no clarity on how long the schools will remain closed. In 2021 we realised that creating a mini version which could be played in small setting, like at home, will remain an alternative option even if schools don't allow visitors from outside the institution. In Greece or Estonia this was still the case beginning of 2022.

Workshops version: over five players in a school setting

Workshops version is to be used with a larger group of people during, for example, Energy Days event organised with local stakeholders.

Workshops version is printed on a stiff¹⁰ cardboard, larger in dimensions and contains 3D objects.

In 2022 due to the relaxation of COVID-19 restriction, the workshops using the game could finally be organized.

The further explained HERON's workshop in **Figure 14: Belgian 2021** workshop in Sterrebeek.

Greece, Glyfada, 13th April 2022 as well as in <u>Greece, Kiffisia, 14th of May 2022</u> or Austrian event in <u>Austria, Seeburg, 20th of May 2022</u> called <u>"Lange Nacht der Forschung</u>" are examples of energy days where the game is used to play with citizens who drop by looking for edutainment¹¹.

Another workshop involving caregivers is planned in the Polish city of Wroclaw in June 2022.

⁹ We had to set up a limit to 10 games per organisation, since the stock was limited to 500 games in total, and there were organisations asking for more than 200 games at once. These organisations have received 10 games from us and one bigger version of the game which can be played in a larger group. They were also additionally contacted by us personally so we could establish contact with organisations interested in intergenerational learning as well as clean energy transition.

¹⁰ Designed to use on recycled 700gsm cardboard sheet with good stiffness, about 1.12mm thick.

¹¹ (video) games, television programmes, or other material, intended to be both educational and enjoyable.





Figure 7: On the left Mini version on a dining table and on the right Workshop version of the same game.

Having the Mini version of the game allowed us to distribute more games in a wider geographical spread, while keeping the production cost small¹². Table 1 below is an overview of countries (in alphabetical order) where the game was shipped (with DECIDE focus countries highlighted):

Country:	Mini version	Workshops version
Austria	Х	Х
Belgium	Х	Х
Estonia	Х	Х
France	Х	
Germany	Х	
Greece	Х	Х
Ireland	Х	
Italy	Х	
Latvia	Х	
Poland	Х	
South Africa	Х	
Spain	Х	

Table 1: Overview of countries where the game was shipped.

More details dedicated to the distribution of the game are available in the section called "Game distribution: the **Geography**" where we also mention the exact numbers of copies delivered.

¹² € 1,8 unit price when producing 500 copies at once.



GAME DISSEMINATION AND DISTRIBUTION

KNOWLEDGE SHARING

DECIDE to ACT project meeting

During DECIDE to ACT project meeting on the 4th November 2021 Arnor Van Leemputten (Th!nkE) had a presentation about the workshop with children he has held with 45 students during 3 sport classes in

Belgium, Sterrebeek, 21st September 2021.

After his short overview of lessons learnt dedicated to the DECIDE consortium members there was space and time left for questions and an exchange on the topic of intergenerational learning. The discussion included two teachers from the Greek schools in Athens, who in collaboration with Heron, a DECIDE pilot, were planning to play the game in their schools.



Figure 8: Arnor Van Leemputten (Th!nk E) presenting the research to the DECIDE Project consortium.



ON-LINE DISSEMINATION

Traffic analytics

Since the game website was launched in May 2021 until 10th of May 2022 we have logged 1.4K visits¹³, which is including more than 1K unique visitors¹⁴ and 3K page views¹⁵.



Geography

Visits by Country May 1, 2021–May 10, 2022, 1,472 in total

We have been monitoring the analytics data to adjust the communication and dissemination efforts accordingly. We were promoting the game in English, since it is the DECIDE project working language, which we determined to be a barrier for a wider outreach. With the support of DECIDE consortium and Th!nk E's colleagues we developed social media posts and its translations which has helped to increase our geographical outreach. Belgium, Greece, Netherlands, Germany, and United States were our top five visitors, followed by Spain, Austria, Portugal, Estonia and Italy.

¹³ The total number of visits in a selected time. How is this calculated? A visit is one browsing session on the site. The number of tracked visits is done with a browser cookie that expires after 30 minutes. Any hits within that 30-minute browsing session count as one visit.

 $^{^{\}rm 14}\,{\rm An}$ estimate of the total number of actual visitors that reached the website.

¹⁵ A total number of views (page requests) across all the pages on the site.



Location	Visits
▶ ■ Belgium 475 (33	2.3%)
▶ 🛤 Greece 160 (10	0.9%)
> S Netherlands 149 (1	0.1%)
🕨 💻 Germany 91 (6	.18%)
United States	i.11%)
> 🖬 Spain 72 (4.	89%)
Austria 62 (4	.21%)
▶ 🖬 Portugal 58 (3.	.94%)

Figure 10: Belgium, Greece, Netherlands, Germany, and United States were our top five visitors, followed by Spain, Austria, Portugal, Estonia and Italy.



Visits by Region

When it comes to regional geography, the visits in Belgium (32.3% of total visits) were mostly from West Flanders (241), Flemish Brabant (70) and Brussels (61) where the game was played in September 2021 (more details about this workshop in the section called "Workshops in

Belgium, Sterrebeek, 21st September 2021").

In Greece (10.9% of total visits) from Attiki (106) and Kentriki Makedonia (33) where the game was played in April 2022 (more details about this workshop in the section called "Workshops in **Figure 14: Belgian 2021** workshop in Sterrebeek.

Greece, Glyfada, 13th April 2022).

Traffic sources

When analysing the website traffic source, we observed that most of the visitors are direct, which can happen by for example scanning the QR printed on the game packaging, pointing users to game instructions game in their local language.

We have also been supported by <u>decide4energy.eu</u> website which pointed 128 visitors to the Power of Community site, <u>gigawattgame.com</u> (91 visitors) which is another energy-related educational game¹⁶ as well as <u>smart-cities-marketplace.ec.europa.eu</u> where we posted an essay about the game¹⁷ linking it to the Smart Cities Marketplace Forum 2021.

¹⁶ We have established the first contact with developers of <u>gigawattgame.com</u> in March 2022 when we started collecting good energy-related European examples of educational material targeted to young audience and we publish these on our website under "<u>Toolbox</u>". ¹⁷ Further reading: https://smart-cities-marketplace.ec.europa.eu/news-and-events/news/2021/intergenerational-learning





Figure 11: Smart Cities Marketplace Forum 2021.



Figure 12: Workshops in Kiffisia, Greece by HERON.



PRODUCT DISTRIBUTION

Geography

The game was distributed to the following countries (DECIDE partner countries highlighted):

Country:	Mini version via on-line questionnaire	Workshops version
Austria	20	2
Belgium	60	2
Estonia	50	2
France	1	
Germany	8	
Greece	220	3
Ireland	10	
Italy	10	
Latvia	10	
Poland	80	
South Africa	2	
Spain	20	

Table 2: the number of games distributed to the various countries.







Figure 13: The game packaging and shipping.

In four situations we shared digital files so the game could be played in a digital environment.

Country:	Digital files sent (#)
Germany	1
Greece	1
Serbia	1
Spain	1
Τα	ble 3: Digital version of the game.



On-line questionnaire to order the game

Since 28th October until 18th of May 2022 we have received in total 50 game requests via our on-line questionnaire. To be able to order the game users needed to fill in an on-line form which included questions like

"Do you talk about renewable energy with children you interact with?"

We use the same set of questions for the on-line questionnaire we send to caregivers after the game was played in schools or during workshops. This way we can compare if responses are different before and after playing the game. We explain this in detail in the chapter called: "Questionnaires for caregivers" on page 41.



WORKSHOPS IN DETAIL

Four workshops with children and adults have been organized by now: one in Belgium, two in Greece and one in Austria. Based on the workshops we can conclude that the game is adaptable to the age of the participants as the person leading the game can adjust the details of the explanation of energy or energy community depending on the audience. Based on the below presented workshops we can conclude that the game has achieved:

- Educational aspect as it can be used to explain renewable energy and energy community concepts in a fun way,
- Engagement aspect it helps get participants engaged while providing a common goal of sharing the energy.

Belgium, Sterrebeek, 21st September 2021

In 2021 with the Th!nk E team we went to test the game at a primary school in Sterrebeek. The game showed adaptable to the circumstances—in this case playing it during the sport class. The total of 45 students played it.

The game was played across a large area both inside and outside the building. This allowed the kids to run around instead of sitting down.

The game was played in multiple rounds to allow the difficulty of the concepts to be raised slowly. With this technique the difficulty level was kept to what the children could handle. Only the puzzle at the end turned out to be too difficult. This was also more difficult to do with an entire class of children. After receiving this feedback communication designer replaced the puzzle with yellow energy cards illustrating different *energy monsters*.







Figure 14: Belgian 2021 workshop in Sterrebeek.

Greece, Glyfada, 13th April 2022

In 2022 HERON is planning a series of actions to raise awareness and disseminate the concept of energy communities in Greece. During their first action that took place on 13th of April 2022, the Smart Tech Lab team of HERON first informed via a virtual interactive presentation the sixth-grade class of the 14th Primary School of Glyfada about the electricity grid, renewable energy production and the concept of energy communities.







Figure 15: Greek 2022 workshop in Glyfada.

Then, the 12-year-old students, under the guidance of the teacher of the department played the The Power of Community game. Project partners from HERON informed us that they used the game to familiarise children with the concepts of renewable electricity generation and energy communities, while creating groups with different consumption and renewable generation levels and have them work together as parts of an energy community.

Additionally, the dependence of renewable energy on the weather is simulated with the roll of a weather dice, highlighting the need to exchange energy depending on the match of demand and consumption. We have received feedback that the activity was a great success and inspired the young producers to "build" their own LEGO Education[©] Renewable Energy Community.

Greece, Kiffisia, 14th of May 2022

HERON further organised second energy workshop this time in cooperation with the Municipality of Kifissia. The event was open to public and a warm invitation to the citizens so they would enrich their knowledge about the concept of Energy Communities. Children were able to participate by playing the game and win special prizes gifted by HERON.





Figure 16: Greek 2022 workshop in Kiffisia.

Austria, Seeburg, 20th of May 2022

Additionally and most recently, as part of DECIDE, Prof. Florian Kutzner welcomed the interested public to the event "Lange Nacht der Forschung" at Seeburg Castle University.





Figure 17: Austrian 2022 workshop in Seeburg.

About 35 people played The power of community game and were introduced that the social science activities of DECIDE.

"Using the game, it was very easy to engage people of all sorts, from pupils to grandparents, and to start discussing the idea of collective energy actions"

– Prof. Florian Kutzner



INTERGENERATIONAL LEARNING ASPECT

In the previous chapters we show that the Power of Community game has educational and engagement aspects. However, the research is conducted to understand if informal educational mean, such as the Power of Community game, can be used to foster intergenerational learning within the family settings, from child to the caregiver. In this chapter we explain how the data was collected to answer this question and which conclusions can be extracted based on the currently available data.

Martins et.al. [1] indicates that from over 3000 intergenerational programs analysed, they collected both qualitative and/or quantitative data. Only few (7) studies collected data in the beginning and at the end of the program. The diversity in the sample size spanned from 14 to 800+ participants and it included participants spanning from 3 month to 16 years for younger generation and 50 to 101 years old for older generation.

In addition to variety in study designs, intergenerational studies use different techniques to evaluate impact, such as scales, questionnaires [3], interviews [3,4], observation, focus groups, and conversation analysis, narratives, videorecorded sessions, and field notes [1].

For this activity, DECIDE uses anonymous questionnaires taken by the caregivers to understand the awareness and behaviour towards sustainable energy and energy communities prior to child playing the game and after the child has played the game and interacted with the caregiver.

DESIGN OF THE QUESTIONNAIRE FOR CAREGIVERS

The questionnaire to caregivers needed to be easily accessible and short, yet to collect information on how much playing of the game influences the respondent to learn more about energy communities and potentially influenced their attitude and behaviour toward energy communities.

To make the game easily accessible to caregivers that play the game with children without asking for any personal data or reaching out to individual caregivers for the schools we are working with QR codes that was added to the packaging of the game. The QR code leads the caregiver to the online questionnaire.

In addition, it was important that the questionnaire is short and easy to complete so that those that land on the page would still complete the questionnaire. The questionnaire has 7 questions and includes 3 types of questions: two yes/no questions, two multiple choice questions and three Likert scale questions.

The online questionnaire form had in total **622 views**¹⁸. It includes 138 users who have started the questionnaire and 50 that completed and submitted. This leaves us with a completion rate

 $^{^{\}rm 18}$ Data from 10 $^{\rm th}$ of May 2022.



of 37% and time to complete on average five minutes. Observed biggest drop-off¹⁹ of 78% happened on the welcome-screen.

Questionnaire in English is provided in the Annex 1.

Multilingual questionnaire

To overcome the language barrier, the game instructions as well as the caregivers' questionnaire are available in eight European languages. On top of that we use machine translation²⁰ when the translation is not yet available.

Estonian: https://agatasmok.typeform.com/to/nVSaadnD

English: https://agatasmok.typeform.com/to/lvg4J950

French: https://agatasmok.typeform.com/to/QCFfotSe

Spanish: https://agatasmok.typeform.com/to/bKM8G81i

German: https://agatasmok.typeform.com/to/ZR8j7mnR

Greek: https://agatasmok.typeform.com/to/ZExgEllE

Italian: https://agatasmok.typeform.com/to/fwLvGxtg

Dutch: https://agatasmok.typeform.com/to/DLuvfURN

Polish: https://agatasmok.typeform.com/to/ja298NTO

GDPR AND ETHICS WHEN DESIGNING THE GAME AND QUESTIONNAIRE

No personal data is collected when distributing and playing the game. Namely, the game is distributed based on the request and we only receive the information about the school or organisation where the game will be played.

The questionnaire responses are collected from the responders' group that did not play the game (Group 0) and the responders whose children played the game (Group 1). The responders are located across Europe in both groups and the responses are averaged to provide a general overview, without any specific responders' data. From the GDPR perspective it was extremely complicated to provide questionnaires to the parents of the children that will

¹⁹ Number of people who saw a particular question and then left the on-line form. % is calculated per question and is the number of people who left divided by the number of views.

²⁰ For this purpose, we use Microsoft Word build in translator, which can be found under top menu Tools \rightarrow Translate \rightarrow Translate document. If MC Word is not an option, we suggest using eTranslation, the Commission's machine translation service.



play the game prior to playing the game. Therefore, to anonymize the data collection, we chose the approach with the random group of responders interested in the game, but that have not yet played the game is used in the Group 0.

Initial testing of the game included the consent form for the caregivers to allow the pictures of children to be taken while playing the game and Information sheet about the project and the research being conducted. For every next time the game was played, we only provided Information sheet about the project, as no pictures or personal data were collected when the games were played.

Workshops' organisers were provided with the information regarding the game and the DECIDE project. In some cases where pictures were taken, separate consent form were used in the local language to assure participants, or their caregivers are aware and consent to the process.

Additionally we suggested the <u>Guide to child friendly communication at events</u>²¹ published by European Commission Publication office as a short and well written guide for teachers.

Data collection strategies

Even though intergenerational learning has been discussed for decades, there is limited literature that provides quantitative evidence of intergenerational learning, including within the family setting. Lawson et.al. [5] points to the difficulty in collecting data on intergenerational learning within the family settings, due to privacy but also motivation issues in collecting the data and knowing what exactly happens within the family settings. Martins et. al. [1] addresses the same problem indicating that from more than 3000 intergenerational programmes examined, only 7 show quantitative data. Moreover, the variation between the different studies creates problems for comparison.

To collect data, prior studies have organized interviews with the caregivers [1-3], questionnaires are conducted with children and/or parents after or prior and after the intervention [1,2,4,5], data on energy consumption has been collected [6], etc. When faced with the issues of data collection, studies typically decrease the sample size [1,2,5,6] or anonymize and randomize the way the questionnaires are conducted [1,4].

In order to create additional motivation for caregivers to complete the anonymous questionnaire, within the DECIDE we used the four strategies, presented below, to increase the data collection.

²¹ European Commission, Directorate-General for Justice and Consumers, Templeton, M., Lundy, L., Guide to child friendly communication at events, 2022, https://data.europa.eu/doi/10.2838/258482





Figure 18: Energy expert pin.

DECIDE strategies used

The data was initially collected in 2021 when the first workshop in Belgium was organized.

There we have worked with three languages and for each language we had Group Zero aimed at caregivers whose children did not play the game and Group One—aimed at caregivers of children who have played the game in school. One of the lessons learned from this workshop, was that only few of the caregivers provided feedback through the questionnaire. To increase the number of responses to the on-line questionnaire after playing the game we translated these to nine European languages. The data collection can also increase by organizing workshop and similar activation events as has been discussed and is discussed below under lessons learned.

As we noticed that just by asking people to provide feedback through questionnaire was inefficient, we decided to use **four strategies** to encourage feedback from the caregivers that played the game with the children:



Strategy name	Motivator	On-line form link	Responses
Order a free "Energy expert" pin for your kid!	Win a free of charge "Energy Expert" pin to those who fill in the form.	https://agatasmok. typeform.com/to/i 2lwEawQ	3
Support our research	Aimed at project partners and other Energy Experts where we invited them to support our European research.	https://agatasmok. typeform.com/to/I vg4J950	4
Unlock extra features	Do you want to unlock extra features after playing the game? Fill in the quiz to discover extra content.	https://agatasmok. typeform.com/to/z AUtJ7px	7
Win an energetic prize for your school!	The more caregivers complete our online quiz the more chances the school has have to win a price.	https://agatasmok. typeform.com/to/ Vf7ARHGU	0
Neutral	Responses received prior to use of strategies.	Not active any more	2

Table 4: Four strategies to encourage feedback.

Each questionnaire has the same questions, only the homepage, to which the scanning of the QR code would lead to, is different. Next to that we have prepared translations of the questionnaire from English to eight European languages for targeted communication and the motivator was mentioned when directly communicating with schools and institutions. For the Power of Community game kits that were ordered online and shipped, approximately even distribution of the games with the specific strategy were used.



Figure 19: Power of Community game kits.



Based on the data on the use of the different landing pages to fill in the questionnaire, the strategy "Unlock extra features" was the most used. However, it is important to underline two main biases: one being the promotion of the "unlock extra features" strategy on the website and social media and the other being that the workshop organizers (to whom the large numbers of the game kits (50+) were shipped choose the games with specific strategy that they believed the target audience would respond to²².

Therefore, due to the bias in the distribution of the game kits and to the small number of respondents, the data provides no conclusive evidence that one of the strategies works better than the other.

QUESTIONNAIRES FOR CAREGIVERS

To understand and evaluate whether playing the Power of Community game initiated intergenerational learning and hence can be used to increase awareness and foster behavioural change we addressed the set of questions to two different groups of respondents. Group 0 refers to the questionnaire participants whose children have not played the Power of Community game and consists of a group of 50 respondents. The responses were collected through the website and include those that answered the questionnaire to order the game kits. Therefore, within this group it is expected that many respondents are already aware of the topics of renewable energy and energy communities, as many of them were ordering the game kits to play with the children or for planned workshops. These respondents are located in 10 European countries (Austria, Belgium, Czechia, Estonia, Germany, Greece, Hungary, Portugal, Serbia and Spain).

The second set of similar but not all identical questions was addressed to a group of respondents/caregivers whose children have played the Power of Community game at school, Group 1. This group of respondents consists of 16 respondents living in Austria, Belgium, Czechia, France, the Netherlands, Greece, Spain, and Italy. The low response rate is due to the fact that many workshops and opportunity to play the game with children in schools could be organized only in April and May 2022. Once the game is played in the workshop with children, they are provided with small game kits to play at home with caregivers. Due to GDPR issues as explained above, it is difficult to reach to caregivers further and motivate them to participate in our research afterwards.

The questionnaires provided to Group 0 and Group 1 respectively are provided in the Annex 1 of this report.

²² The distribution of the games with different strategies was not randomized.



COMPARATIVE ANALYSIS

In order to assess if there is an increase in awareness or change in intended behaviour towards energy communities caused by playing the Power of Community game, we compare the average of the responses to the questionnaire of Group 0 (respondents whose children did not (yet) play the game) and Group 1 (respondents whose children played the game). The comparative analysis provided based on each of the questions in the questionnaire is available in Annex 2 of the report.

Based on the collected data and the analysis presented in Annex 2, limited conclusions can be drawn about the effects of intergenerational learning from the children that played the Power of community game towards their caregivers. The results show that responders from Group 0, in most cases, outperform responders from Group 1 indicating higher awareness of energy and energy community topics and increased willingness to act and communicate to their community regarding sustainable energy and energy communities. However, these results do not indicate much regarding the effectiveness of the game or effect of intergenerational learning, mainly due to the differences in Group 0 and Group 1 respondents as indicated above. Namely, Group 0 questionnaire responses are collected mainly online from the respondents that wanted to order the game kits. Therefore, it is assumed that this group consists of responders/caregivers active in the field of energy and/or energy communities and more aware of these topics than respondents from Group 1. On the other hand, Group 1 responses are collected by caregivers scanning the QR code on the game kit and filling in the questionnaire. Hence this group is assumed to be more representative of the average caregiver.

Two aspects of the presented results are insightful and interesting to understand the caregivers from Group 1. First, responses to all questions show that caregivers from Group 1, while less than responders from Group 0, are very much aware of the need for sustainable energy and possibility for collective energy action to help save energy, fight climate change, and strengthen the community. The second is that the Group 1 respondents showed the same understanding of the concept of energy community of Group 0 and in addition showed more focus on the benefit a community should provide to the member of the energy community, then the Group 0. This could have been the effect of the intergenerational learning, as the game had a strong focus on the role of the community and acting together. However, this cannot be conclusively stated based on the analysed data.

LESSONS LEARNED

COVID-19 pandemic restriction significantly limited the activation events and possibilities to play the Power of community game within the school setting or to involve caregivers. Moreover, the complications in direct communication with the parents needed to respect GDPR rules, mentioned above, significantly limited the possible designs where prior and post



intervention questionnaire responses could be collected from the similar group of respondents. Regardless prior literature [1,5] already indicates the difficulties in collecting relevant data from children and caregivers in order to assess intergenerational learning effects of informal education activities.

Based on the experiences with running this research activity, and for the sake of better design for future similar research activities, we propose the improve design of this activity trough the consideration of five steps:

- 1. Public activation event at the school where caregivers are asked to anonymously fill in the initial questionnaire prior to playing the game.
- 2. During the activation event the game could be played with children and caregivers to increase the interest of caregivers for the game and help with initial instructions. This could empower both children and caregivers to feel more confident playing the game at home.
- 3. The children and caregivers would be provided a small game kit to allow for them to play the game at home.
- 4. The game would be played at home involving caregiver and child(ren).
- 5. The second public event at the school would be organized where caregivers would be asked to anonymously fill in the questionnaire after having played the game. The purpose of this event is to increase response rate of the caregivers after the game has been played.



NEXT STEPS

The activity around the effect of intergenerational learning within familial setting through informal education activity within DECIDE project is completed with this report. However, games have been distributed to the project partners and other addresses and there are still plans to play the game with the children in different EU member states (Estonia, Germany etc.) within 2022 and 2023, based on already distributed material.

The DECIDE project team will encourage participants and organizers to modify the design of the activities to bring it closer to the proposed design (where anonymous questionnaires are collected from the same group of caregivers prior and post intervention). The new data and its results will be further analysed, presented at EUSEW 2022²³ and included in the final report.

In addition to this, the Power of Community game will be further developed within the scope of ENCLUDE²⁴ H2020 project. The game can be further developed by adding features or digitalizing the game. Digital version of the game could be offered in form of a (most likely web-based) app.

ENERGY-RELATED TOOLBOX ON-LINE

By the end of 2022 on the Power of Community website is planned to be transformed into a Toolkit promoting other informal educational materials, such as games, books, graphic novels, and events which are related to European Clean Energy Transition. The toolbox is targeted for schools and institutions working with youth who would like to introduce the subject in a fun way.

²³ We have been informed that our application for the Policy Conference of the European Sustainable Energy Week (EUSEW) 2022 has been successful. Our event on energy behaviour focusing on the youth was allocated a slot on Thursday 29 September 2022 from 09:30 to 11:00 and we will use it to further share knowledge connected to the Power of Community game.
 ²⁴ <u>https://encludeproject.eu/</u>



CONCLUSIONS

The DECIDE project is aimed at understanding how to spark motivation with individuals to increase awareness about the energy transition and increase willingness to become more active and join an energy community or a collective energy action. Within the scope of understanding what motivates people and how to activate them, this research activity focused on how and if intergenerational learning directed from child to the caregiver can help accelerate adoption of energy communities and collective actions.

The field of intergenerational learning is not new. However, the understanding of the intergenerational learning directed from child to caregiver is relatively young and many studies are still exploratory and qualitative in nature. While studies show that the children can motivate the change in behaviour and views of parents and caregivers through informal educational activities oriented towards intergenerational learning within family, there are many factors that influence the success of knowledge transfer and behavioural change. Most important include family dynamics, child's age and gender, child empowerment with knowledge and actions to change the behaviour.

This report presents the Power of community board game which has been developed within DECIDE project. The game can be used for informal educational activity with children to increase knowledge about sustainable energy and energy communities, as well as to motivate change in the dynamics of energy system. The game is versatile and depending on the activation event and participants can be played not only with children but also with teenagers and adults.

In this report we show how the Power of community game has been used within the DECIDE project to involve more than 500 children from 12 different countries. Some of the foreseen activities have been limited due to Covid-19 restrictions and are yet to be organized.

To measure the impact of the informal educational activity through intergenerational learning on the awareness and behaviour of caregivers/parents, the data collection through pre and post intervention anonymous questionnaire has been conducted. To improve the rate of response and motivate caregivers to provide their feedback after playing the game with children or discussion on the topic, four different strategies have been tested.

The data collected until 31st of May 2022 is not conclusive to conclude the effect of Power of community game on intergenerational learning directed from child to caregiver/parent. The game has shown to be engaging and educational for different generations and adaptable to various levels of prior knowledge on the topic of sustainable energy and energy communities.



While further data will be collected and analysed, the knowledge acquired during this activity can be used to help initiatives across Europe, especially ones involved with DECIDE project, develop more inclusive energy communities and collective actions.



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ANNEX 1: QUESTIONNAIRES TO ASSESS AWARENESS AND POTENTIAL BEHAVIOUR CHANGE

Questions addressed to Group 0: respondents whose children have not played the game

- 1. Do you talk about renewable energy with children you interact with? (Yes/No)
- 2. Have you searched for information about renewable energy online?
 - Yes, several times.
 - Yes, not often.
 - No, never.
- 3. Which of the following descriptions fit to your understanding of / knowledge about Energy Communities?
 - It is a group of people taking action in energy domain.
 - It is a community that creates benefits for its members.
 - It is an initiative that one can join on voluntary basis.
 - All of the above.
 - I don't know.
- 4. How much do you agree to the following statements?
 - I find it important to be conscious about my energy behaviour and/or I find it important to use more sustainable energy.
 - I want to motivate others in my local community to save energy and/or I want to save energy together with other people in my community.
 - I think collective energy actions are a good way for a community to fight climate change.
 - I think collective energy actions could strengthen our community.
- 5. If you would participate in an energy community, to what extent would the following motivators play a role for you?
 - Saving money through lower energy prices.
 - Helping mitigate the climate change.
 - Creating a sense of community through stronger relations with my neighbourhood.
 - Having my friends/ family members join an energy community.
- 6. How much do you agree to the following statements? (Likert scale 1-7 from strongly disagree to strongly agree)
 - If someone in my neighbourhood would organise an energy community, I would participate in it.



- I would talk with neighbours or friends about potentially forming or joining an energy community.
- If I had the opportunity, I would like to learn more about Energy Communities.
- 7. Did you ever talk with neighbours or friends about potentially forming or joining an energy community? (Yes/No)

Questions addressed to Group 1: respondents whose children have played the game

- 1. Did you talk about renewable energy since the game was played? (Yes/No)
- 2. Have you searched for information about renewable energy online?
 - Yes, several times since the game was played.
 - Yes, once since the game was played.
 - Yes, but more before the game was played.
 - No, never.
- 3. Which of the following descriptions fit to your understanding of / knowledge about Energy Communities?
 - It is a group of people taking action in energy domain.
 - It is a community that creates benefits for its members.
 - It is an initiative that one can join on voluntary basis.
 - All of the above.
 - I don't know.
- 4. How much do you agree to the following statements? (Likert scale 1-7 from strongly disagree to strongly agree)
 - I find it important to be conscious about my energy behaviour and/or I find it important to use more sustainable energy.
 - I want to motivate others in my local community to save energy and/or I want to save energy together with other people in my community.
 - I think collective energy actions are a good way for a community to fight climate change.
 - I think collective energy actions could strengthen our community.
- 5. If you would participate in an energy community, to what extent would the following motivators play a role for you?
 - Saving money through lower energy prices.
 - Helping mitigate the climate change.
 - Creating a sense of community through stronger relations with my neighbourhood.
 - Having my friends/ family members join an energy community.



- 6. How much do you agree to the following statements? (Likert scale 1-7 from strongly disagree to strongly agree)
 - If someone in my neighbourhood would organise an energy community, I would participate in it.
 - I would talk with neighbours or friends about potentially forming or joining an energy community.
 - If I had the opportunity, I would like to learn more about Energy Communities.
- 7. Did you ever talk with neighbours or friends about potentially forming or joining an energy community? (Yes/No)



ANNEX 2: DETAILED COMPARATIVE ANALYSIS OF THE QUESTIONNAIRE RESPONSES

Question 1 of the Questionnaire

Group 0 : Do you talk about renewable energy with children you interact with? Group 1: Did you talk about renewable energy since the game was played?

Figure 20 represents the results of the first questionnaire question which is aimed at gaining an insight into whether playing the game by the children has an influence on the respondents' (caregivers') interest towards renewable energy. Within the Group 0, control group of respondents whose children did not play the game, 96% indicated they talked about renewable energy with children, and within Group 1, participants whose children played the game, indicate slightly lower numbers (88%). These questionnaire results indicate that majority of respondents of both groups talk to children about renewable energy. The results cannot be used to indicate if playing the game had an effect on the behaviour of the respondents from the Group 1.



Figure 20: Comparative analysis of first questionnaire question.



Question 2 of the Questionnaire

2. Group 0 and 1: Have you searched for information about renewable energy online?

The second question has equivalent research goals compared to the first question and aims to gain deeper understanding of the respondent's interest in renewable energy by identifying how many times they have searched for renewable energy technologies online. Figure shows that 79% of respondents from the Group 0 regularly search the internet for information about renewable energy. This is not surprising as most of these participants accessed the questionnaire through social media and website, specifically for the purpose of ordering the game kits.



Figure 21: Questionnaire responses for online interest in renewable energy for Group 0.

Figure 22 shows the behaviour of the participants from the Group 1 after their children have participated in a live session of the Power of Community game. The answers are mixed with 67% indicating they searched for information about renewable energy online since their child has played the game (of which 20% only once). This leaves 33% of respondents answering they decreased the number of times they searched the internet or did not go online for renewable energy information at all. Based on this data Group 0 is significantly more active in searching for renewable energy information online. These results additionally point towards the conclusion that the Group 0, which includes the responders that actively reached out to complete the questionnaire to order the game, are not an ideal control group for assessing the responses of the average caregiver of children in EU countries²⁵. Therefore, in the rest of

²⁵ Group 0 responses have been collected through website questionnaire that needs to be submitted to be able to order the game kit. It is fair to assume that these respondents are aware of energy and energy community topics.



the comparison we will notice Group 0 constantly overperforming Group 1 in awareness and willingness to become active in energy community initiatives.



Figure 22: Questionnaire responses for online interest in renewable energy for Group 1.

Question 3 of the Questionnaire

3. Group 0 and 1: Which of the following descriptions fit to your understanding of / knowledge about Energy Communities?

The goal of question 3 is to investigate the knowledge of the questionnaire respondent towards energy communities. The DECIDE website provides the following definition of an energy community:

"An energy community (EC) is a way to organise collective energy actions around open democratic participation and governance and to provide benefits to its members or the local community. Benefits can be social, environmental, or economic, though the latter should not be the driver. Participation is open to a wide group of stakeholders, citizens, local governments, public entities and companies, but decision making can be limited to avoid those large entities active in the sector monopolize the initiative."

The possible answers to question 3 each include a part of this definition, therefore, the response "all of the above" is the most correct answer. In Figure 23 it can be observed that majority of responders from both groups chose "all of the above". Moreover, it is interesting that Group 1, responders whose children played the game, have significant higher share of responders, 18% in comparison to Group 0 (6%), that chose the answer that within energy



community "it is a community that created benefits for its members". Based on this we can conclude that even though Group 0 has prior understanding of energy and energy communities, Group 1 performs similar in understanding the concept of energy communities and even has better understanding of the importance of the community aspect. The design of the Power of Community game puts a focus on the importance of community working together for energy community to function well. As previous research shows [3] during informal education activities children retain more of the content and less of the activities and hence transfer this aspect to their caregivers. Therefore, from playing the game, children very possibly retained the concept of the importance of the community acting together to create benefits for each other within the energy community, which was retained with the caregivers as well.



Figure 23: Comparative analysis of knowledge about energy communities between Group 0 and Group 1.

Question 4 of the Questionnaire

4. Group 0 and 1: How much do you agree to the following statements?

The fourth question queries the internal motivators for sustainability and collective actions based on 4 questions. The questions are graded based on a Likert scale (from 1: strongly disagree – to 7: strongly agree). The following analysis compares the average Likert score of respondents from Group 0, whose child did not participate in the Power of community game and Group 1, whose child did play the game at least once. Figure 24 shows the four asked questions, the average Likert scores with the standard deviation, indicating variability among the responders of each group, based on the questionnaire responses.





Figure 24: comparative analysis of social and ecological drivers.

As can be observed in Figure 24, Group 0 generally outperforms Group 1, having generally high scores between 6.4 and 6.6 for all four questions, in comparison to 5.5 - 5.8 for Group 0. Moreover, the standard deviation of 50 respondents from Group 0 is lower with 0.9-1.1, while for Group 1, with 16 respondents it is between 1.4-2.0 depending on the question. Both groups agree the most with the statement "I find it important to be conscious about my energy behaviour and/or I find it important to use more sustainable energy".

These results again prove the assumption that Group 0, while representing respondents from across Europe includes more likeminded people that are more aware of energy and energy community topics. Hence their responses are more optimistic towards sustainable energy, energy savings and energy communities and similar to each other. On the other hand, Group 1 represents more varied responses. Encouraging fact is that the responders of Group 1, even though with more varied opinions, are overall agreeable that sustainable energy is needed, that community should save energy and work in a collective manner to do this. From this data it is not clear how much the attitude towards sustainable energy and energy communities of Group 1 respondents improved due to their child playing the game.



Question 5 of the Questionnaire

5. Group 0 and 1: If you would participate in an energy community, to what extent would the following motivators play a role for you?

Question 5 aims to get an insight into the *drivers* for joining an energy community. Figure 25Figure compares the results for four different drivers for respondents from Group 0 and Group 1. Similar to the previous question, the average Likert scores and the standard deviation, indicating variability among the responders of each group, are depicted in the different graphs.

The most important driver for Group 0 to join an energy community is to help mitigate climate change where an average Likert score of 6.4 ± 1.2 can be observed. Besides the main motivator, Group 0 ranks the other drivers very close to each other with average Likert scores of 5.8 ± 1.4 , 5.7 ± 1.2 and 5.5 ± 1.4 , for saving money, creating community relations, and having friends and family join the energy community, respectively. This again indicates the typical responders active in the field of sustainable energy who are very much aware of close relation of sustainable energy actions and climate mitigation.

On the other hand, Group 1 indicates economic drivers as the primary motivation for joining an energy community (5.7 ± 1.8). Besides the main motivator, Group 1 ranks the other drivers so that mitigating climate change and creating community relations close to each other with average Likert scores of 5.4 ± 1.9 and 5.4 ± 1.4 , respectively. Finally having family or friends join an energy community is rated more neutral, being not very good motivator for Group 1 with average response of 4.2 ± 1.9 .

In line with previous question, we see more variation among respondents from Group 1. The Power of Community game tackles the motivator of together saving the energy and using sustainable energy and puts focus on the community, and not family or friends.

However, from this data it cannot be concluded if the playing of the game by the children changes the motivators of the respondents/caregivers from the Group 1.





Figure 25: Comparative analysis drivers for joining an energy community.

Question 6 of the Questionnaire

6. Group 0 and 1: How much do you agree to the following statements? (From 1: strongly disagree – to 7: strongly agree)

Question 6 investigates the willingness of respondents towards setting up or participating in an energy community initiative based on three questionnaire questions. For each of the questions a Likert scale is used to grade the answers and the average Likert score together with the standard deviation, indication variation in the responses of the group, is presented below.

As can be seen in Figure 26, Figure 27 and Figure 28 Group 0 scores significantly higher in all three questions in comparison to Group 1, while the variation in responses within the groups are similar. This points towards the fact that respondents from Group 0 are significantly more willing to become active participants in promoting and forming an energy community, then respondents from Group 1.



However, this data does not indicate if the playing of the game by the children of the respondents of Group 1 changes their willingness towards the more active behaviour towards energy communities.



Figure 26: Comparative analysis of willingness to join an energy community.



Figure 27: Comparative analysis of willingness to form an energy community.





Question 7 of the Questionnaire

7. Group 0 and 1: Did you ever talk with neighbours or friends about potentially forming or joining an energy community?

The final question reflected on whether the research participants took action to talk with their neighbours about forming an energy community. In Group 0 the replies were equally distributed between yes and no as 49% of the respondents indicated to have already talked with their neighbours about forming an energy community. In contrary, only 31 % of the respondents from Group 1 talked to their neighbours or friends about forming or joining an energy community.

Based on this and previous question it can be concluded that respondents from Group 1 are generally less active and willing to talk about or participate in forming an energy community, in comparison to Group 0. This is expected as Group 0 is assumed to include many participants that are already active in the field of energy and/or energy communities and hence are more aware of the topics. The collected data cannot be used to assess if the intergenerational learning helped improve attitude or positively change behaviour of caregivers from Group 1 towards the sustainable energy and energy communities.





Figure 29: Comparative analysis of willingness to talk about forming or joining an energy community for Group 0 and Group 1.



Annex 3: DECIDE Ethics form

ETHICS DOCUMENTATION DECIDE						
Checklist for DELIVERABLES	/MILESTONES on ethical issues					
Introduction	The basis of DECIDE's scientific approach is the conformity of its work with ethical principles. These include respect for human beings and human dignity, the fair distribution of the benefits and burden of research, the rights and interests of research participants, and the need to ensure the free and informed consent of participants (including vulnerable groups such as children). Whenever research approaches or interventions are pursued within DECIDE that involve people or have an impact on people and their environment (e.g. interviews, workshops,), they must be examined for their ethical implications. The aim of this checklist is to review DECIDE's scientific products (deliverables and milestones) from an ethical point of view, but above all to enable a quick ethical review during the planning and development of these outputs.					
Remark	In parallel to the ethics check, DECIDE data management guidelines are developed which will include: Guidelines/descriptions for procedures for data collection, storage, protection, retention, transfer, destruction or re-use. Description of the security measures that will be implemented to prevent unauthorised access to personal data or the equipment used for processing, methods of storage and exchange (LAN, cloud, etc.) Description of the anonymisation/ pseudonymisation techniques that will be implemented or explanation on why the research data will not be anonymised/ pseudonymised Detailed information on the informed consent procedures in regard to data processing					
		Tiel	. 41-		Demonius	Courses of us without in a
	ISSUES	Tick the box		e		Sources of Verification
		Y	N	n/a	n/a – does not apply	



Research ethics general						
	Do you confirm having handled research subjects with respect and care, and in accordance with legal and ethical provisions (to your best knowledge)?	x			self-assessment	
	Do you confirm having taken account of research relevant differences in age, gender, culture, religion, ethnic origin and social class (if this applies)?			х	If Y, to be mentioned in Deliverable report	Deliverable report
	Do you confirm having considered potential research related harms and risks?			x	If any, to be mentioned in Deliverable Summary	Deliverable report
	Are there any unethical ways (e.g. to stigmatise, discriminate against, harass or intimidate people) in which the methods or knowledge produced could be used?		х		If Y, what did you do to prevent this?	deliverable report
Stakeholder rights, interests and dignity						
	Has the role of your local research partners/stakeholders clearly been defined and communicated?	x				Deliverable report; Information sheets; Consent forms.
	Do local stakeholder groups/partners involved in your research have their own ethical guidelines/boards? If so, did they approve your research?	x			If any, written approval	consent forms
	Have you been evaluating/analysing their programs and services? If so, will they be given a copy of your findings?			x		copy sent to partners/ stakeholders
	Are there any potentially negative, unintended consequences of the research cooperation with local partners for local people?			x	If any, to be mentioned in Deliverable report including ways to avoid this	Deliverable report
	Could the research have induced psychological stress or anxiety or cause negative consequences beyond the risks encountered in normal life?			x	If any, to be mentioned in Deliverable report including ways to avoid this	Deliverable report
	Has there been the possibility that the involvement of stakeholders created a situation where they felt real or perceived coercion to participate in your research? If yes, how did you manage/prevent this situation?			x	If any, to be mentioned in Deliverable report including ways to avoid this	Deliverable report
	Have the following European fundamental rights been observed: The rights of the child; Equality between women and men; Integration of persons with disabilities?	x				Conformity to European fundamental rights
Research design/Methodology						
	Has the research design been sensitive to the particular needs and perspectives of targeted stakeholder groups?	х				Methodology description in Deliverable Report



	Does the methodology clearly describe how data have been collected and analysed during the work? Did research involve the sharing of data or confidential information beyond the initial consents given?	×	×			Methodology and data management description in Deliverable Report Consent forms; amendments to consent forms; Deliverable report
	Are people other than direct research participants likely to be directly impacted by the research?		x		if Y, discuss in Deliverable report	Deliverable report
	Did you make arrangements to preserve confidentiality for participants or those potentially affected?			x	Please explain the mechanisms in place to ensure the confidentiality of private information,	DECIDE Data management guidelines; (infomation sheets);
	Has the methodology addressed ways in which sensitive information, data or sources will be handled? (e.g. personal data, data protection, tracking of people)			x		Methodology and data management description in Deliverable Report
	Have participants been asked to give informed consent in writing and have they been provided with information about the research?	x				Information sheet and consent form
	Have the research approach/aims been discussed with stakeholders involved?	х				Deliverable report and information sheets
	Has information (written and verbal) about the research been provided in an appropriate form and language for potential participants?	x				Information sheets translated
	Did you offer any incentives (other than reasonable expenses and compensation for time) to research participants?			х	If yes, what could be the potential ethical issues arising from this?	methodology description in Deliverable report
Data management/protection	Have personal data been processed in any way (e.g. collected, shared, stored,)?		x			Copy of questionnaire/online questionnaire url; Deliverable report methodology part; reference to DECIDE Data management guidelines; (Indication of own Data documentation systems of DECIDE partners if any)
	Have personal data been anonymized other pseudonymized before processing?			x	Description of data processing (collection, management, storage) in deliverable . Describe how you anonymized/pseudonymized the personal data.	Deliverable report; reference to DECIDE Data management guidelines; (Indication of own Data documentation systems of DECIDE partners if any)



Did you practise tracking or observation or profiling of participants ?		x	In the deliverable, provide explanation how the data subjects have been informed of the existence of the profiling, its possible consequences and how their fundamental rights have been safeguarded	Informed consent of participants; Deliverable report
Did the research involve the collection of photographic or video materials?	x		Describe the purposes: if to be used in any outputs (publication, dissemination, etc.)Or to be made publicly available (e.g. in social media, magazine articles)?	Informed consent of participants with specific permission of photographic or video recording; Specific permission in case of further use (e.g. publications, social media); Deliverable report; In case of use in social media: social media statement etc must include the researcher/supervisor contact details and a statement that the study has received relevant ethical approvals
Has there been any audio collection?		x	Describe the purposes: only for transcribing/summarising purposes? to be used in any outputs (publication, dissemination, etc.)? To be made publicly available (e.g. in social media, magazine articles)?	Informed consent of participants. In case of any use beyond transcription, specific justification is needed; in case of use in social media: social media statement etc must include the researcher/supervisor contact details and a statement that the study has received relevant ethical approvals
Have you followed the Data management guidelines of DECIDE?	x			
Have people providing personal data been informed on data processing including period of preservation?	x			Informed Consent Forms



	Did you define how access to the research findings of this deliverable/milestone including processed data will be regulated within DECIDE and externally?		x	Describe how you will collect, manage and store the personal data (taking into consideration the Data Protection Act and the 8 Data Protection Principles).	Intellectual property rights and Citation rules inside DECIDE
Publication and					
Dissemination of research results					
	Have research results in this deliverable been presented in an open, honest, transparent and accurate manner, respecting confidentiality of data or findings ?	x		self-assessment	(Deliverable report)
	Have results in this deliverable reported in a way that is compatible with the standards of the discipline and can be verified?	x			Deliverable report
	Have all authors agreed on the sequence of authorship (acknowledging that authorship itself is based on a significant contribution to the design of the research, relevant data collection, or the analysis or interpretation of the results)?	x			Report history documentation (emails, SharePoint)
	Have authors of the deliverable ensured that their work is made available to colleagues in a timely, open, transparent, and accurate manner?	x			Report history documentation (emails, SharePoint)
	Have all authors of the deliverable acknowledged important work and intellectual contributions of others, including collaborators, assistants, and funders and cited related work correctly?	x		self-assessment	
	Will the results of the study be offered to those participants or other parties involved who may wish to receive them?	х			Type of Deliverable; (consent forms)
Vulnerable individuals/groups incl. children					



Did the research work involve particip who are particularly vulnerable or una to give informed consent?	pants able	x	Provide details on type of vulnerability, details on recruitment, inclusion/exclusion criteria, informed consent procedure. Demonstrate efforts to ensure informed understanding of implications of participation; Describe procedures used to ensure that there was no coercion on participants.	Informed consent forms; Information sheets; Deliverable report
Did the research work particularly invo	olve	x	Provide details on recruitment, inclusion/exclusion criteria, informed consent procedure (e.g. age ranges, children assent procedures and parental consent). Demonstrate efforts to ensure informed understanding of implications of participation; Describe procedures used to ensure that there was no coercion on participants and to ensure welfare of minors. Justify the involvement of minors	Informed consent forms; Information sheets; Deliverable report





PARTNERS





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