



Interoperable solutions for implementing holistic **FLEXi**bility
services in the distribution **GRID**

RRI progress report – Month 48

Deliverable 2.8

WP2

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ABBREVIATIONS

PC: Project Coordinator
CA: Consortium Agreement
CC: Communication Committee
DMP: Data Management Plan
DoA: Description of Action
EC: European Commission
GA: General Assembly
H2020: Horizon 2020
IPR: Intellectual Property Right
KPI: Key Performance Indicator
M: Month
PH: Project Handbook
R&D: Research and Development
RRI: Responsible Research and Innovation
SC: Steering Committee
SME: Small and Medium Enterprise
TP: Technical Partner
WP: Work Package

DISCLAIMER OF WARRANTIES

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EXECUTIVE SUMMARY

This document reports the effort put into responsible research and innovation (RRI) by partners involved in FLEXIGRID project during the fourth year of the project, as well as the plans for the project's final year. It is a follow-up to the deliverables *D2.5 – D2.7* which map the RRI progress in the previous three years.

The report is divided into sections related to specific cross-cutting issues promoted by the European Commission (EC). Specifically, the report tackles the gender equality, open access and public engagement elements of RRI. The gender structure of the project team at different levels is reported in Table 2. The open access is promoted by ensuring public access to the project's public deliverables and scientific publications. All open access publications are uploaded to Zenodo repository and listed in Table 3. This includes deliverables and scientific publications. To address the public engagement element, during the fourth year of the project six RRI events were held.

While in the final section the previous RRI reports delivered the plans for the next year, this deliverable presents the overall conclusions from the four years of implementing RRI in FLEXIGRID. In the first year, a RRI plan was developed, which included public engagement events, setting up a Zenodo repository for open-access outputs, and reporting on gender equality in the consortium. The subsequent three years saw the execution of this plan, including 15 public engagement events, 27 open-access uploads, and four yearly reports. The public engagement events were conducted, including discussions with stakeholders in Greece, Spain, Italy, and Croatia. These events aimed to disseminate project solutions and gather feedback.

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1. INTRODUCTION

1.1. The FLEXIGRID project

The main goal of FLEXIGRID is to allow the distribution grid to operate in a secure and stable manner when a large share of variable generation electricity sources is connected to low and medium voltage grids. To fulfil this goal FLEXIGRID project introduced a three-level approach aiming at flexibility, reliability, and economic efficiency through the development of innovative hardware and software solutions.

These solutions were demonstrated in four demo-sites across Europe, i.e., Croatia, Greece, Spain, and Italy, ensuring their interoperability through its integration into an open-source platform able to harmonize the data flow between FLEXIGRID solutions and the real grid.

1.2. The objective and scope

This deliverable is the last of four periodic reports on responsible research and innovation (RRI) in FLEXIGRID project. This report is the result of activities in task 2.4 of work package 2, which aims at monitoring *integration of the responsible research and innovation approach in FLEXIGRID*. RRI integration in the project was a continuous effort of all partners in the consortium and RRI permeates in some degree through all the project tasks. However, this deliverable is directly connected to:

- Task 1.3 *Quality Assurance Plan and Data Management Plan* through the data management plan element
- Task 2.2 Definition of stakeholders' common requirements towards a smart citizen-centred energy system
- Work package 9 *Communication and dissemination activities*. Decision was made to integrate RRI into the dissemination activities of the work package 9 and use them not only to spread the information about the project but also to gather feedback from the participants.

The deliverable presents a report on the fourth year of the project. In the first section the topic of RRI is introduced, its implications on FLEXIGRID project are described and a report on the RRI integration during the fourth year of the project is presented. The second section presents the overall conclusions of RRI efforts during the four years of FLEXIGRID project.

2. RRI DURING THE FOURTH YEAR OF FLEXIGRID PROJECT

The RRI is an approach to research and innovation promoted by the European Commission (EC) to ensure that the projects it funds are ingrained in society and local communities. The EC provided six thematic elements, i.e., policy agendas, to focus on, as shown in Figure 1. These thematic elements are gender issues, ethics, open access, public engagement, science education and governance. In FLEXIGRID, the focus is placed on open access, public engagement and gender components of RRI. We did not plan to explicitly include the rest of the thematic elements in the task activities, but they are incorporated implicitly through the activities of this and other work packages in the project. For example, ethical points of originality and innovation in research are encouraged in the aspect of scientific publications. This, in connection with the open access principle, ensures the replicability of the developed models and results of the project.

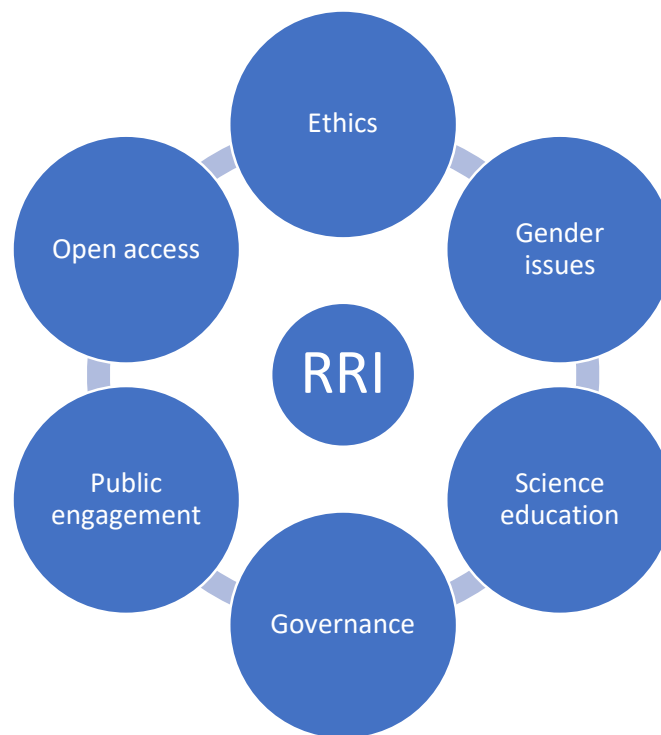


Figure 1 The six thematic elements of RRI

During the first months of the project, a plan for integrating the RRI into the project was prepared. The plan for task 2.4 comprised two types of activities. Firstly, it was decided to focus on integration of open access in the project, and, secondly, to focus on organising various promotional and educational activities. The former group was named *Open access* and the latter *Public engagement*. *Gender equality* is a specific cross-cutting issue because it affects the project throughout the duration.

Table 1 shows the actions of Task 2.4 Integration of the Responsible Research and Innovation approach in FLEXIGRID completed by month 48 of the project, this deliverable being the last action on the list.

Table 1 Completed actions in task 2.4 of FLEXIGRID project

ACTION	WHO	WHEN
Setting the scope and budget for events	CIRCE, UNIZG-FER	M3
Defining the events (locations, duration, budget, etc.)	All	M6
Preparation and scheduling of events	CIRCE, UNIZG-FER	M11
RRI progress report 1	UNIZG-FER	M12
First round of RRI events	UNIZG-FER	M20
RRI progress report 2	UNIZG-FER	M24
Second round of RRI events	UNIZG-FER, EDYNA, VERD, VIESGO, UNICAN	M25-M31
RRI progress report 3	UNIZG-FER	M36
Third round of RRI events	UNIZG-FER, EDYNA, MOH (former VERD), IOSA	M40-M45
Zenodo repository	All	M11-M48
RRI progress report 4	UNIZG-FER	M48

2.1. Gender equality

As stated in the project proposal, FLEXIGRID partners are committed to foster gender equality and are aware of the Gender Equality in Horizon 2020 guidelines. In this regard, the project tasks and responsibilities are divided among both genders in a balanced and non-discriminatory way.

Table 2 describes the gender structure at different levels within the consortium members during the last year of the project, while Figure 2 shows the same in percentages. Female to male ratio increased to 25% compared to the previous year's 24%. Compared to the previous year, the share of positions taken by women decreased in senior category from 25% to 24%, however it increased in junior category from 21% to 24% and in manager category from 25% to 29%. Overall, women were underrepresented in FLEXIGRID, compared with the EU statistics¹.

Table 2 Gender structure at different levels during second year of the project

Partner	Female researchers			Male researchers			Female other than researchers			Male other than researchers			TOTAL
	Junior	Senior	Manager	Junior	Senior	Manager	Junior	Senior	Manager	Junior	Senior	Manager	
CIRCE	0	2	2	3	11	5	1	5	3	1	1	3	37
VIESGO	0	1	0	0	9	1	0	0	1	0	0	0	12
VERD	0	1	0	2	5	1	0	1	0	0	1	1	12
HEP-ODS	0	0	0	0	0	0	4	0	0	11	0	1	16
EDYNA	0	0	0	0	2	1	0	0	0	1	0	0	4
OP&A	0	1	0	0	5	0	0	0	0	0	0	0	6
ZIV	0	1	1	0	1	1	0	0	0	0	0	0	4
SELTA-DP	0	0	0	0	0	1	0	0	1	0	2	1	5
ATOS	0	2	0	0	9	0	0	0	0	0	0	0	11

¹ <https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20230602-1>

IOSA	0	0	0	0	0	0	0	0	1	1	1	1	4
HYPERTECH	0	3	0	0	6	1	0	1	0	0	0	0	11
UNICAN	0	2	0	1	4	1	0	1	1	0	0	0	10
UNIZG-FER	2	1	0	1	9	1	0	0	0	0	0	0	14
LINKS	0	0	0	3	1	2	0	0	0	0	0	0	6
CAP	0	0	0	0	0	0	1	0	0	0	1	1	3
MOH ²	0	1	0	2	4	1	0	0	0	0	0	0	8
TOTAL	2	15	3	12	66	16	6	8	7	14	6	8	155

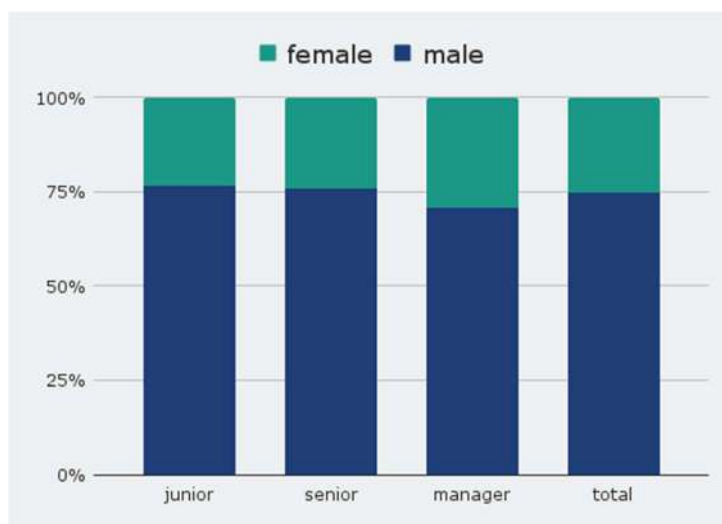


Figure 2 Gender structure of the consortium

The full implementation of the eight FLEXIGRID use cases is aimed at covering the need of the whole population, regardless of sex, gender or age. Therefore, the project’s outputs do not directly affect women or men and there is no gender dimension in the technical tasks to be carried out. Thus, the activities that were developed in the project do not require sex or gender analysis.

2.2. Open access

In FLEXIGRID we promote open access publishing and aim to make as many of our deliverables and other outputs available to a wide audience. At the end of the project’s second year deliverable D1.3 *Update of Data Management Plan-Month 24* was completed, and its follow-up D1.4 is due at the end of the project. In these deliverables the FLEXIGRID consortium set the goal of publishing the public deliverables, research outputs and open-access data on Zenodo³ platform. As an additional effort in Task 2.4, we set up a Zenodo community for FLEXIGRID project. This enabled easier tracking and reporting on the project’s open-access outputs, gave the project more visibility and ensured the accessibility of results well past the project duration. The repository can be reached through the following link: <https://zenodo.org/communities/flexigrid/>

² MOH took over VERD’s remaining responsibilities after acquiring the company in January 2023

³ Zenodo is a repository hosted by CERN where all research outputs can be uploaded and become citable. The documents uploaded to Zenodo can be organised into curated communities, such as European Commission Funded Research (OpenAIRE), a community for uploads funded by the EC through FP7 or H2020 programmes. More: <https://rri-tools.eu/about-rri>

Table 3 holds the list of the documents uploaded to the Zenodo repository during the fourth year of the project. In total, nine publications were uploaded to Zenodo during the last year⁴.

Table 3 List of documents uploaded to Zenodo repository

DOCUMENT	WHO	WHEN PUBLISHED
Impact of Wind Generation on Line Protection	ZIV	19/07/2021
FROM TRADITIONAL TO DIGITAL ASSET MANAGEMENT OF NETWORK COMPONENTS	OPA, VIESGO, UNICAN	20/09/2021
Advanced Phase Selection for Severe Line Protection Requirements	ZIV	01/06/2022
Impact of Renewable Energy Sources on the Protection of MV Distribution Networks	ZIV, CIRCE	20/06/2022
Influence of Negative Sequence Injection Strategies on Faulted Phase Selector Performance	CIRCE	19/08/2022
Detection and Classification of Fault Types in Distribution Lines by Applying Contrastive Learning to GAN Encoded Time-series of Pulse Reflectometry Signals	CIRCE	14/10/2022
EXPERIENCIA PILOTO DE LOCALIZACIÓN DE FALTAS EN RED DE MEDIA TENSIÓN MEDIANTE LA TÉCNICA DE LA REFLECTOMETRÍA EN EL DOMINIO DEL TIEMPO (TDR) EN EL PROYECTO H2020 – FLEXIGRID	CIRCE, UNICAN, ZIV, EDP Redes España	14/12/2022
Acoustic Noise-Based Detection of Ferroresonance Events in Isolated Neutral Power Systems with Inductive Voltage Transformers	UNICAN	01/01/2023
Pp OPF - Pandapower Implementation of Three-phase Optimal Power Flow Model	UNIZG-FER	06/02/2023
Modeling and Simulation of Time Domain Reflectometry Signals on a Real Network for Use in Fault Classification and Location	CIRCE	06/03/2023
Three-Stage Modeling Framework for Analyzing Islanding Capabilities of Decarbonized Energy Communities	UNIZG-FER	25/05/2023
Modeliranje i analiza niskonaponskih mreža temeljene na podacima prikazanim u geoinformacijskim sustavima	UNIZG-FER	06/06/2023
Od pametnih brojlara do budućih gubitaka - pristup strojnog učenja	UNIZG-FER	06/06/2023
Razvoj programskih rješenja za modeliranje i analizu naprednih distribucijskih mreža	UNIZG-FER	06/06/2023
Smart secondary substation development and demonstration under FLEXIGRID project	OPA, VIESGO	12/06/2023

⁴ NOTE: At the finalisation of this document, some public deliverables are in the process of revision and for that reason have not yet been uploaded to Zenodo platform. They will be uploaded as soon as they are submitted to Funding & Tenders portal.

Generation of synthetic examples using generative adversarial networks (GAN) to extend a database of fault signals on power distribution lines (Poster)	CIRCE	15/06/2023
Generation of synthetic examples using generative adversarial networks (GAN) to extend a database of fault signals on power distribution lines (Journal article)	CIRCE	15/06/2023
SENS - Tool for Planning and Operation of Smart Distribution Networks	UNIZG-FER	15/06/2023
Techniques to Locate the Origin of Power Quality Disturbances in a Power System: A Review	UNICAN, CIRCE	17/06/2023
Free Simulation Tools for Power Quality and Grid-Integration of Renewable Energies Cases	UNICAN	21/07/2023
Analytics and Optimization Techniques on Feeder Identification in Smart Grids	ZIV	27/07/2023
A computer-assisted Faulted Phase Selection Algorithm for dealing with the effects of Renewable Resources in Smart grids	CIRCE	05/09/2023
TransSiamese: A Transformer-Based Siamese Network for Anomaly Detection in Time Series as Approach for Fault Location in Distribution Grids	CIRCE	18/09/2023

2.3. Public engagement

To engage the public in the decision-making process of FLEXIGRID, a series of RRI events was planned for the second, third and fourth years of the project. The goal of these events was to be in line with RRI guidelines by including a wide variety of stakeholders and addressing as many policy agendas as possible. The events were held between M13 and M20 in the second year of the project, between M25 and M31 in the third year, and between M40 and M45 in the fourth year.

The events were planned in conjunction with work package 9, with an aim to transform the one-way communication that is the dissemination of the project into a two-way communication. This way the partners not only shared the information about FLEXIGRID, but also collected useful feedback from the public.

The decision was made to integrate public outreach activities into the dissemination events of work package 9 and to include them in the agenda of each Steering Committee meeting. The events consisted of presentation of the project and a workshop during which the stakeholders' feedback will be collected. Responsible for the organisation of each event were the partners from the country where the events have been hosted. Due to COVID-19 confinement measures the events in years two and three were planned in the online form.

For every event the hosting partner gathered a group of stakeholders to participate, prepared a presentation and a workshop and filled a report after the event. To prepare the workshop tools collected through RRI Tools project available in the RRI Tools website⁵ were used.

⁵ <https://rri-tools.eu/>

2.3.1. Planning of the events

Three main components of the events were the participants, the topic and the workshop format. First, the topic and the participants were selected and based on the topic and the participants, the workshop format was chosen to ensure maximum applicability of its results.

The process of participant selection was done by the partner hosting the event. These events were aimed at getting feedback from all stakeholders that recognise the value of the project results. The partners were encouraged to use this event to collect useful inputs from the public on a task of the FLEXIGRID project they are responsible for. The selected group of stakeholders should be relevant for the current phase of the project and the tasks for which the partners hosting the event are responsible. The relevant stakeholders were selected from one or more of the following categories:

- Consumers (residential, commercial or industrial separately)
- Associations (professional and citizens', as well as energy co-ops)
- Equipment producers and vendors
- Research institutions
- Energy sector representatives
- Public bodies (market operators, regulatory bodies, funding agencies, etc.)
- Local authorities and policy makers

These are the categories used in the Stakeholder Mapping document for T2.2. The consortium strived to cover all stakeholder groups during the course of the project.

The topic of the event was chosen in the same way as the participants. Event hosts decided the topic based on their organisation's role in FLEXIGRID project, aiming to collect as much useful feedback from the participants as possible.

The last step was preparation of the events. After the first decisions were made, the format of the workshop was decided. Optimal format was decided by considering the participants and the topic, as well as the organisers and the venue. RRI events organised within FLEXIGRID comprised the following three activities, spanning up to two hours in total:

- Survey
- Presentation
- Workshop

2.3.1.1. Survey

First, a survey is conducted to determine the participants' knowledge and opinions about the topic. The surveys were short and asked only basic questions, taking up to 5 minutes of time. The results were used to describe the group in the report and to make the results and conclusions reached at different events comparable. It was also possible to use this survey to collect the stakeholders' feedback on specific topic prior to the event.

2.3.1.2. Presentations

After the survey is collected, the organisers held presentations to introduce the topic of the event. Besides preparing the participants for the workshop, the presentations disseminated information about the project and filled the participants' knowledge gaps. The organiser of the event prepared the presentation, considering the participants' knowledge about the topic. The presentations did not take up more than 5-7 minutes each.

2.3.1.3. Workshop

The main activity in the event was a workshop. The workshop took up to one hour. The main purpose of the workshop was to implement RRI into the event by collecting the stakeholders’ feedback and reaching out to the public. Structure of the workshop was chosen depending on the group of participants, using tools collected through the RRI Tools project such as the ActionCatalogue.

2.3.1.4. Reporting

After the event, the organisers prepared a report in which they presented the key results and conclusions of the survey and the workshop. The report was submitted in a form of a spreadsheet and is included in the RRI progress reports.

2.3.2. Events held in the fourth year

During the fourth year of the project six stakeholder events were held. The list of events is given in Table 4. The reports on the events can be found in APPENDIX A. Report on FLEXIGIRD’s stakeholder engagement activities.

Table 4 List of stakeholder events

ACTION	WHO	WHEN
RRI event in Greece: - Discussion with hotel owners	MOH (former VERD), IOSA	25/04/2023
RRI event in Italy: - Panel discussion with local authorities and regulatory bodies	EDYNA	30/03/2023
RRI events in Croatia: - Policy Lab	UNIZG-FER	31/01/2023
- Regional energy summit workshop	UNIZG-FER	05/04/2023
- Days of new energy workshop	UNIZG-FER	19/04/2023
- MIPRO symposium round table	UNIZG-FER	22/05/2023

2.3.2.1. Stakeholders' event in Greece



Figure 3 The speaker was Spiros Vlachos from IOSA

The live event held in April 2023 engaged 18 representatives of hotel owners in the island of Thasos. The aim of the event was to assess the interest of the hotel owners in replicating the solutions developed in FLEXIGRID Greek demo site.

The questionnaires were used to get the hotel owners' feedback on the solutions, and to compare their responses to those collected during the previous workshop, held in October 2021.

Key results can be presented as per below:

- Over 90% of the respondents would install PVs in their premises to reduce their energy costs and over 60% would also consider installing a battery system to deal with network issues (power outages, voltage drops etc.).
- All the respondents said they would need timeline, cost and a techno-economic analysis of the potential benefits before installing any smart energy system on their premises.
- About 56% of the respondents would allow automatic control of the PV, battery and EV charging points while an additional 22% would also consider the option as long as they were being asked before the system takes any decision.
- As a final conclusion and after participating in the event, all of the respondents would consider installing PVs on their premises while around 90% would also consider pairing them with a battery system for additional benefits.

2.3.2.2. Panel discussion in Italy

The Italian RRI event was held as a workshop during the project General Assembly the 30th of March 2023. The theme of the discussion was the regulatory framework, technical requirements and flexibility goals of the participating stakeholders.

The speakers were:

- Marco Pasquadibisceglie (Regulatory Authority for Energy, Networks and the Environment, ARERA),
- Corrado Gadaleta and Michele Poli (Italian TSO, TERNA),
- Fabio Zanellini (National Association Confindustria, ANIE),

- Maurizio Pareti (SELTA).

2.3.2.3. Policy Lab in Croatia

Policy Lab is a round table of stakeholders engaged with energy communities and active consumer-provided flexibility services in Croatian energy sector. It was held in January 2023 at UNIZG-FER premises.



Figure 4 Policy Lab in Croatia, January 2023

As a follow-up to the Policy Lab held in the previous year with an aim of determining the prerequisites for development of energy communities in Croatia, this year's event had the following discussion points:

- What role does the DSO play in enabling active consumers to participate in energy communities and market-based flexibility services?
- The contracts between the active consumers and existing (DSO, supplier) or new market actors (energy communities, aggregators), including financial, legal and regulatory provisions.
- Obstacles and possible solutions for pilot and full-scale projects dealing with active consumers who provide flexibility services or engage in renewable energy sharing.

Following a fruitful discussion, the following conclusions were drawn:

- The DSO needs to define and specify all segments in contracts for energy communities and their members and establish the methodology for energy sharing scheme, as well as data sharing guidelines for flexibility service providers (e.g. aggregators).
- The regulatory framework in Croatia for defining the roles and responsibilities for entities involved in energy communities and flexibility services is unclear. Based on the already existing frameworks from different EU countries, it is crucial to define the differences and similarities in Croatian regulation in order to implement well-established and on-going practices from other countries.
- Already existing projects with installed PV systems suitable for energy communities, such as Technology park in Križevci established by ZEZ (Zelena energetska zadruga), will serve as a baseline for energy communities in Croatia.

2.3.2.4. *Regional energy summit in Croatia*

The regional summit "Green Plan in the Energy Sector" was held in Zagreb on 5 April 2023. It was organised by media company Poslovni dnevnik and it brought together the most important stakeholders of the energy market in Croatia and neighboring countries. The focus of the summit was on cooperation in the field of development of gas and oil flows, power grids and renewable energy sources. Three panel discussions discussed old energy sources in new political environments, the modernization of the electric power infrastructure in the region and regional incentives for the development of RES. Tomislav Capuder participated on behalf of UNIZG-FER in the discussion about power grid infrastructure, along with four other experts in from research institutes and industry. Key conclusions of the summit were:

- The region has a lot of work to do in modernizing the electricity grid, particularly when considering the integration of renewable energy sources. Most countries in the region, except Slovenia, are quite slow in modernizing infrastructure compared to the set goals.
- Thanks to European funds, the necessary funds are available, and projects need to be adequately prepared so that they can be administratively implemented and applied for.
- Technical and administrative challenges need to be addressed, including the integration of renewable energy sources and the difficulty of connecting to the grid and commissioning power plants.
- All of the countries' plans are to revitalize the system because of the potential of renewable energy sources, and the infrastructure should follow.

2.3.2.5. *Days of new energy workshop in Croatia*

From April 18th to 20th, 2023, Belmet 97 company organized a conference and fair of didactic and educational equipment titled "2nd New Energies Days" in Tuhelj, Croatia. Experts in the fields of new energies, renewable energy sources, and electromobility presented interesting lectures to around 150 participants from Croatia and the neighbouring countries. The speakers included Slobodan Danko Bosanac, who discussed energy sources for space travel, Vlasta Zanki, who covered topics on green transition and decarbonization of society, Igor Grozdanic, who talked about the importance of green transition and renewable hydrogen for energy processes in Croatia, Ljubomir Majdandžić, who focused on solar power plants for self-production/consumption of electricity, and Mirna Gržanić (UNIZG-FER), who discussed energy communities and collective self-consumption of energy from renewable sources. Additionally, there was a lecture by Assoc. Prof. Vedran Kirinčić on energy transition in the transportation sector. Apart from the lectures, a panel discussion on the topic of "Key Knowledge and Education for Successful Energy Transition" generated significant interest. The panelists included Stevče Arsoski, Marinko Stojkov, Igor Grozdanic, and Vedran Kirinčić, who shared their expertise and experiences.

Overall, the conference and fair "2nd New Energies Days" provided a platform for renowned Croatian experts to share their knowledge on new energies, renewable sources, and electromobility. It facilitated fruitful discussions on key topics related to energy transition and showcased the latest didactic and educational equipment. The event not only promoted collaboration among professionals but also engaged professors and students, fostering awareness and understanding of the advancements in the field of energy. It also put a focus on the end-user, the need for their education and more interaction with the system where, eventually, they need to become a base flexibility provider. Different forms of how the end-users can profit from provision of system services were presented, in the line with knowledge and experience of the FLEXIGRID project.



Figure 5 Mirna Gržanić presenting in 2nd Days of new energy

2.3.2.6. MIPRO symposium round table in Croatia

During the MIPRO symposium in Opatija, Croatia, UNIZG-FER held a round table discussion with relevant stakeholders from the Croatian electricity sector. Representatives of the regulatory agency (HERA), TSO (HOPS), DSO (HEP-ODS) and the first Croatian aggregator KOER were present. The discussion was moderated by prof. Hrvoje Pandžić from UNIZG-FER. The audience was comprised of industry professionals and power engineering students. The aims of the discussion were the following:

- Inform the public about developments in flexibility service markets in Croatia.
- Answer how the green transition can be sped up by putting an emphasis on distributed flexibility resources.
- Detect obstacles for including more end users in market mechanisms.

The discussion revolved about the present state of Croatian flexibility service markets and current developments in the regulatory framework surrounding it. The representative of KOER, an aggregator, described their experience as a new market entity that, at the beginning, was not



Figure 6 Participants of the round table

defined by law, and difficulties that brought. Overall conclusion among the panellists was that flexibility markets in Croatia are developing slowly, but steadily, and that implementation of new pan-European projects such as MARI and PICASSO improve the progress a lot.

The audience was asked two questions before and after the discussion:

1. Assess your knowledge about flexibility services between: “I know a lot”, “I know some”, “I heard about it”, “I know nothing”.
2. Assess how difficult it is for end users to offer flexibility services between 1 = Impossible and 10 = No obstacles.

The results of knowledge self-assessment can be seen in Figure 7, as participants gained valuable knowledge during the discussion.

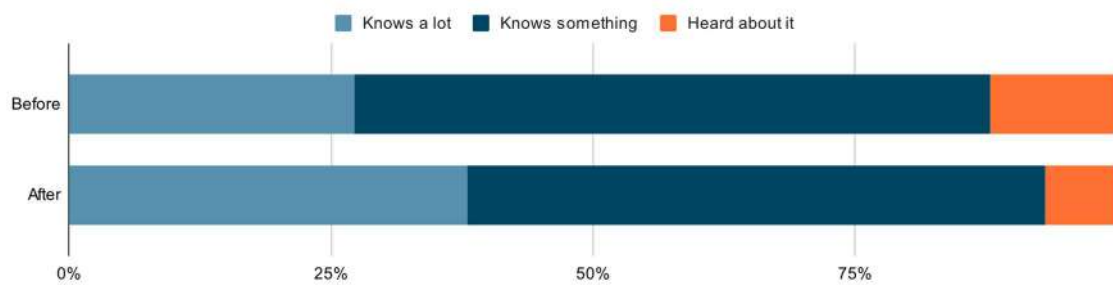


Figure 7 Self-assessment of knowledge about flexibility services

The respondents have shown pessimistic view of Croatian flexibility markets, assessing the difficulty around 4.3/10. Although the average answer increased after the discussion, it was still below 5.

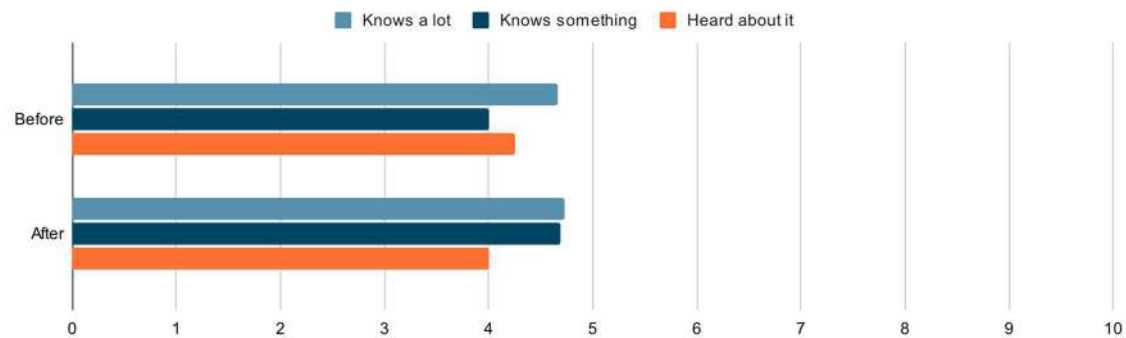


Figure 8 Assessment of difficulty for end users to offer flexibility services

3. OVERVIEW OF RRI DURING THE FOUR YEARS OF FLEXIGRID

RRI was implemented in FLEXIGRID throughout the four years of the project. During the first year, a plan was developed for implementation of RRI. The plan included:

- conducting public engagement events jointly with dissemination activities from WP9
- setting up Zenodo repository for hosting the project’s open-access outputs
- reporting on gender equality in the project consortium

The following three years were spent in implementing the plan through 15 events, 27 open-access uploads to Zenodo and four yearly reports, including this one.

3.1. Gender equality

The demonstration sites in FLEXIGRID are technical and do not include a gender component. However, the consortium is comprised of people and the RRI reports highlight the gender distribution within the project consortium over the four-year period. In Figure 9 it can be seen that, while in the first year the share of female consortium members was in all categories over 30%, in the next year it fell below that number for most categories and remained below for the duration of the project.



Figure 9 Share of female consortium members throughout the years

In Figure 9 it can be seen that overall, the share of female consortium members in junior category increased from second year until the end of the project, while in the senior category it decreased. The gender structure of each partner organisation is different and subject to complex influences. Due to its complexity, it is impossible to pinpoint specific reasons for the changes in the gender structure.

3.2. Open access

A Zenodo repository for the project was set up in the first year to enable easier tracking and reporting on the project’s open-access outputs. Pre-prints were provided for the non-open-access scientific publications. The repository increased the project’s visibility and ensured the accessibility of results after the project’s end.

In total, 27 documents were uploaded to the repository:

- 1 presentation
- 2 posters
- 10 deliverables
- 9 journal papers
- 5 conference papers

3.3. Public engagement

There were fifteen RRI events held during the project. The events were aimed at disseminating information about the solutions developed in the project and collecting feedback from the stakeholders.

In Greece, discussions with hotel owners were held to present innovative energy solutions implemented in the Greek demo site. The feedback from the hotel owners showed interest in installing similar solutions, with a focus on reducing energy costs and addressing network issues.

Spanish partners hosted discussions to address the challenges of future grids and showcase the solutions proposed by the FLEXIGRID project. Survey results indicated that reducing electricity bills was a primary motivation for adopting flexibility devices, while factors like reduced comfort, lack of communication, and regulations were seen as obstacles.

In Italy, panel discussions engaged representatives from local authorities and regulatory bodies in discussions on the future of distribution grids. The events resulted in interest from regulatory agencies and positive feedback from local politicians and electricity producers.

In Croatia, multiple events were organized to analyse the technological readiness and social acceptance of the new Electricity Market Act and implementation of flexibility services. These events included online panel discussions and round table sessions, involving stakeholders from various sectors. The discussions focused on technological solutions for smart grids, legal frameworks for energy communities, and the importance of technical and social aspects in the energy transition.

During the COVID-19 pandemic, a set of measures were developed to mitigate the risks related to confinement measures. During that period RRI events were held online.

4. APPENDIX A. Report on FLEXIGIRD's stakeholder engagement activities

Hosting partner	Stakeholder engagement activity	Date	Involved partners	Dominant RRI element	Language	Format of the event	Local authorities	Industry	Research Institutes	General Public	Policy Makers	Energy sector	Equipment producers and vendors	Customers	Associations	Other	Total of stakeholders reached
UNIZG-FER	Policy Lab 2023	31/01/2023		public engagement	Croatian	Round table - moderated discussion among the key institutions responsible for development of flexibility services at the distribution level in Croatia.		2	3		1	4			3		13
Main conclusions		<p>The ministry representatives confirmed that the legal framework is completed, which opens the floor for practical provisions to be made by the DSO and regulatory agencies (HERA and HROTE).</p> <p>The complications regarding energy netting, grid fees, financial settlement and billing were pointed out as the largest obstacles for energy communities by the DSO representatives. This was supported by other participants, with the general conclusion that a well-defined and fair set of rules is necessary in order for energy communities to take off.</p> <p>Finally, a study of different cases of energy community configuration and settlement rules was defined to be conducted by UNIZG-FER, with the data inputs provided by ODS representatives.</p>															
UNIZG-FER	Regional energy summit	05/04/2023		public engagement	Croatian	A panel discussion on modernization of energy infrastructure			1			1			2	200	204

						in the South-Eastern Europe region													
Main conclusions		The region has a large number of relatively small electricity systems that need to be modernized to accommodate renewable energy sources. Technical and administrative challenges need to be addressed, including the integration of renewable energy sources and the difficulty of connecting to the grid and commissioning power plants. Most countries in the region are slow in modernizing infrastructure, but funding from the European Union is speeding things up.																	
UNIZG-FER	2nd New Energies Days	19/04/2023		public engagement	Croatian	A presentation and a panel discussion on a) new roles of end users, b) educational activities empowering flexibility locked with the end users												150	150
Main conclusions		The conference and fair "2nd New Energies Days" successfully brought together renowned Croatian experts in the field of new energies, renewable sources, and electromobility, allowing them to share valuable insights and knowledge. The event also provided an opportunity for participants to engage with the latest didactic and educational equipment, promoting awareness and collaboration in the pursuit of energy transition and sustainable practices.																	
MOH / IOSA	Stakeholders' event	25/04/2023	Greek demo partners	public engagement	Greek	Live event - discussion amongst hotel owners. Reached out to the stakeholders of the event to present innovative energy solutions and the FLEXIGRID project												18	18
Main conclusions		<p>We presented FLEXIGRID's Greek demo results to a group of hotel owners in the island of Thasos. We then distributed questionnaires to get their feedback and thoughts about installing smart energy solutions in their premises and also compare their responses to the ones they gave us during the last RRI event which was held in October 2021</p> <p>Key results can be presented as per below:</p> <ul style="list-style-type: none"> - over 90% of the respondents would install PVs in their premises to reduce their energy costs and over 60% would also consider installing a battery system to deal with network issues (power outages, voltage drops etc.) - All the respondents said they would need timeline, cost and a techno-economic analysis of the potential benefits before installing any smart energy system on their premises - about 56% of the respondents would allow automatic control of the PV, battery and EV charging points while an additional 22% would also consider the option as long as they were being asked before the system takes any decision. - As a final conclusion and after participating in the event, all of the respondents would consider installing PVs on their premises while around 90% would also consider pairing them with a battery system for additional benefits 																	

EDYNA	Stakeholder event	18/05/2023		governance	Italian	Panel discussion/round table about the relationship between standards and new network needs													
Main conclusions																			
UNIZG-FER	Mipro symposium round table	22/05/2023		public engagement	Croatian	Round table with power system representatives								18				12	30
Main conclusions		Legal framework is updated continuously, during the last year several legal acts were adjusted to the new market setting. This will enable a wider participation of end users in flexibility service provision. The audience was comprised of industry professionals and electrical power engineering students. They were asked to assess how difficult it is to offer flexibility services as an end user in Croatia, and the panel shifted their average opinion to more optimistic range.																	