TWINERGY

Project Management Plan Revision 1

D1.6

April 2022

Twinergy has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 957736

Deliverable

PROJECT ACRONYM	GRANT AGREEMENT #	PROJECT TITLE
TWINERGY	**957736**	**Intelligent interconnection of prosumers in positive energy communities with twins of things for digital energy markets**

DELIVERABLE REFERENCE NUMBER AND TITLE

D1.6
Project Management Plan - Revision 1

Revision: v1.0

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DISSEMINATION LEVEL

✔ **P** **Public**

C Confidential, only for members of the consortium and the Commission Services

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Version History

REVISION	DATE	AUTHORS	ORGANISATION	DESCRIPTION
v0.1	27.04.2022	Vasiliki Lazari Stylianos Karatzas	UoP	1st draft of Project Management Plan Revision 1
v0.1_rev[UNIVBRIS]	28.04.2022	Theo Tryfonas	UNIVBRIS	1st draft after 1st review
v0.1_rev[TH OWL]	28.04.2022	Fynn Christian Bollhöfer Axel Balke	TH OWL	1st draft after 2nd review
v0.2	28.04.2022	Vasiliki Lazari Stylianos Karatzas Athanasios Chassiakos	UoP	2nd draft after compiling review contributions
v1.0	28.04.2022	Vasiliki Lazari Stylianos Karatzas Athanasios Chassiakos	UoP	Draft submitted to EC by the PC

Statement of Originality

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

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Executive Summary

The present document (D1.6) contains an updated version of the deliverable D1.5 Project Management Plan of the TwinERGY project (till M18 of the project – April 30th, 2022), funded by the European Commission's Innovation and Networks Executive Agency (CINEA), under its Horizon 2020 Research and Innovation programme (H2020). The main objective of this deliverable is to become a reference document for the TwinERGY consortium regarding the way in which the overall management of the project will be carried out, taking into account good practices and establishing procedures that can contribute to the effective monitoring and control of the project throughout its duration. It is intended to provide guidance and support to build a working framework for the participants in terms of administrative forms, financial aspects and quality processes, in order to ensure that the project objectives will be achieved. Therefore, the deliverable explains the roles and responsibilities of the participants within the project, describes the mechanisms for internal communication, monitoring, deliverable preparation and reviewing and, lastly, defines the procedures for reporting and requesting adjustments. The Project Management Plan should be updated throughout the project, whenever the aforementioned procedures are modified or the TwinERGY participants agree on including additional information and processes.

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1. Introduction

The main aim of the TwinERGY project is to introduce an innovative energy system aligned with EU regulations that will combine already existing advanced technologies into a new interoperable framework, business models and consumer-centric services to offer a comprehensive solution to empower citizens active participation into the new EU energy market. In order for this to be achieved, TwinERGY project will consider the involvement of energy consumers' associations, providing substantial knowledge regarding the consumers and the energy market relations, since consumer behavior is considered as the main concept for understanding, managing and accomplishing sustainable energy consumption. In line with all the above, TwinERGY is a "user-oriented" project in which the participation of consumers is important for a successful outcome. In this way, the consortium shows its respect to the European and national legislation regarding privacy and safety issues, as well as its concern about the privacy and safety protection of project participants.

1.1 Deliverable scope

The deliverable Project Management Plan is a manual intended to be used by the project participants to guide them through administrative, financial and quality procedures of the project either within the consortium or externally towards the European Commission. It defines the multiple roles and responsibilities of TwinERGY project management structure and communication mechanisms to accommodate the partners need for effective collaboration, in order to achieve the project goals, as they are specified within the Grant Agreement and the Consortium Agreement. Furthermore, it outlines the overall management strategy and tools that will support the project progress monitoring and control. During the project lifespan some of the aforementioned procedures may be modified to accommodate consortium needs. Taking this into consideration two revisions of the D1.5 Project Management Plan are foreseen to be provided in M18 and M36 of the project.

1.2 Deliverable Structure

The structure of this deliverable consists of the following chapters:

- Chapter 1 is the introductory section of the deliverable which presents the purpose, the structure, the reference documents and the abbreviation list.
- Chapter 2 presents briefly general information about the project, its funding and its participants.
- Chapter 3 describes the management structure of the TwinERGY project and explains the multiple roles of the consortium and the respective responsibilities.

- Chapter 4 summarizes the project working plan in terms of tasks, scheduling, milestones, and deliverables as well as the related resources.
- Chapter 5 explains the project procedures that aim in assuring high-quality results, including the course of action for internal communication among members of the consortium, meeting planning, deliverable preparation, conflict management, change requests and amendments.
- Chapter 6 explains the procedures for project progress monitoring, preparing technical and financial reports and receiving payments from the EC.
- The final section of the deliverable contains the Annexes of the Project Management Plan.

1.3 Reference Documents

This document is based on the following reference documents:

- TwinERGY deliverable D1.5 Project Management Plan
- TwinERGY deliverable D1.2 Data Management Plan – Revision 2
- TwinERGY Grant Agreement no.957736
- TwinERGY Consortium Agreement
- Horizon 2020 AGA – Annotated Model Grant Agreement
- Horizon 2020 Online Manual: *https://ec.europa.eu/research/participants/docs/h2020-funding-guide/index_en.htm*

1.4 Abbreviation List

Table 1. Abbreviation list

Acronym	Full Name
H2020	Horizon 2020
EC	European Commission
CINEA	European Climate Infrastructure and Environment Executive Agency
DoA	Description of Action
GA	Grant Agreement
CA	Consortium Agreement
WP	Work Package

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WPL	Work Package Leader
TL	Task Leader
PL	Pilot Leader
DL	Deliverable Leader
PC	Project Coordinator
PO	Project Officer
PM	Person Month
KOM	Kick-off Meeting
DMC	Data Monitoring Committee
PDM	Project Data Manager

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2. Project General Information

Table 2. Project general information

Project number:	957736
Responsible Unit:	INEA/H/01
Call:	H2020-LC-SC3-2018-2019-2020 submitted for H2020-LC-SC3-2020-EC-ES-SCC / 29 Jan 2020
Topic:	LC-SC3-EC-3-2020 - Consumer engagement and demand response
Type of Action:	Innovation Action
Duration:	36 months
Entry into force of the Grant:	31/08/2020
Project Start Date:	01/11/2020
Project End Date:	31/10/2023

2.1 Budget

The total eligible costs of the project amounts to 7,090,310.00 €. The Maximum EU fund of the project amounts to 5,903,474.39 € and equals to the 83.26 % of total costs.

2.2 Participants

The consortium of TwinERGY is composed by 18 partners and 2 third parties from 12 different countries.

Table 3. List of TwinERGY participants

No.	Partner	Short Name	Country
1.	PANEPISTIMIO PATRON	UoP	Greece
2.	STAM SRL	STAM SRL	Italy

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3.	TECHNISCHE HOCHSCHULE OSTWESTFALEN-LIPPE	TH OWL	Germany
4.	UNIVERSIDADE NOVA DE LISBOA	UNL	Portugal
5.	IES R&D	IES R&D	Ireland
6.	BENETUTTI	BENETUTTI	Italy
7.	UNIVERSITY OF BRISTOL	UNIVBRIS	UK
8.	KNOWLE WEST MEDIA CENTRE LBG	KWMC	UK
9.	SUITE5 DATA INTELLIGENCE SOLUTIONS LIMITED	SUITE5	Cyprus
10.	ETRA INVESTIGACION Y DESARROLLO SA	ETRA	Spain
11.	WORLD ENERGY CONSORTIUM P.L.C.	WEC P.L.C.	Malta
12.	MYTILINAIOS ANONIMI ETAIREIA	MYTILINEOS	Greece
13	BRISTOL CITY COUNCIL	BCC	UK
14.	EUROPEAN DYNAMICS LUXEMBOURG SA	ED LUXEMBOURG	Luxembourg
15.	Stadt Steinheim	Stadt Steinheim	Germany
16.	IDEAS 3493 SL	IFC	Spain
17.	ARTHUR'S LEGAL BV	ARTHUR'S LEGAL	NL
18.	Smart Energy Europe	smartEN	Belgium

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3. Management Structure

The organizational structure of TwinERGY Consortium is fully described in the Project Consortium Agreement. The following figure identifies the management structure of TwinERGY project and the interrelations within it.

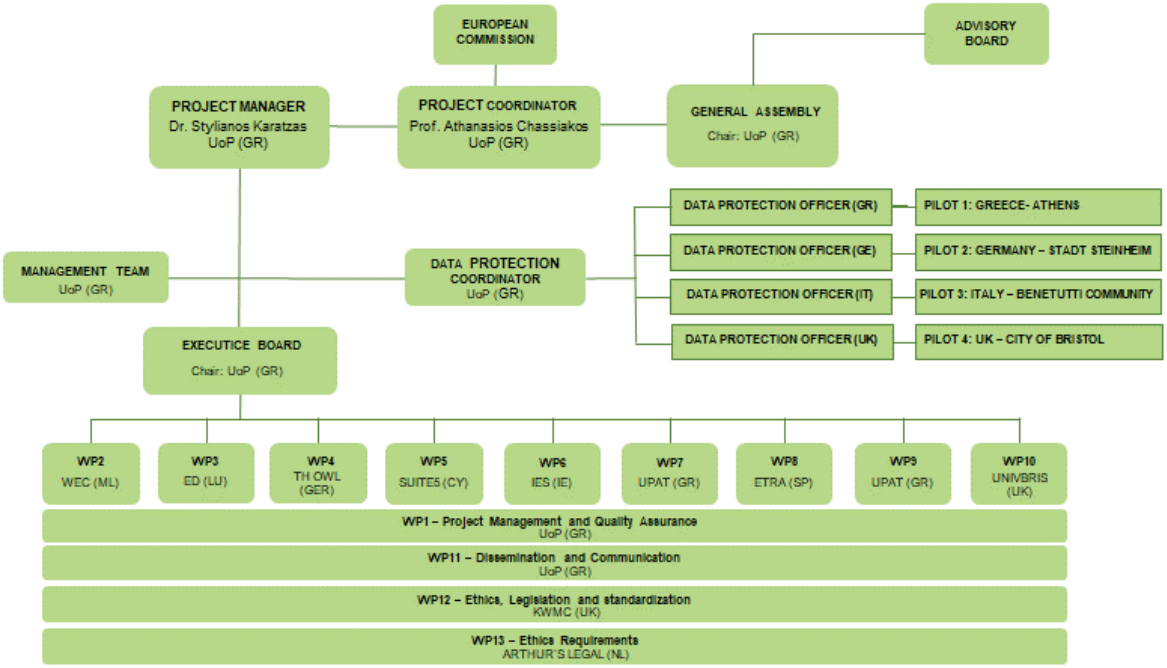

Figure 1. Management structure of TwinERGY project

3.1 Project Coordinator

The Project Coordinator (UoP, represented by Prof. Athanasios Chassiakos) is ultimately responsible for the vision, ethics and overall management of the project and also accountable for the project direction and success. More specifically, the Project Coordinator role is to:

- Coordinate the decision-making process.
- Be an intermediary between the project partners and the EC.
- Monitor the compliance of the Parties with their obligations.
- Collect, review and submit reports, other deliverables (including financial statements and related certifications) and specific requested documents to the Funding Authority.
- Transmit documents and information related to the project to any other Parties concerned.
- Provide, upon request, the Parties with official copies or originals of documents that are in the sole possession of the Coordinator, when such copies or originals are necessary for the Parties to present claims.

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- Distribute to the consortium the financial contribution of the Funding Authority to the project.
- Chair the meetings and monitor the implementation of decisions made during these meetings.

3.2 Project Manager

The Project Manager (UoP, represented by Dr. Stylianos Karatzas) is appointed by the Project Coordinator and is under his direct supervision, his role is to assist the work of the coordinator and the steering boards for executing the decisions of the consortium as well as for the day-to-day management. More specifically, the Project Manager is responsible for:

- Communicating on a daily basis with international project partners.
- Tracking progress against programme objectives.
- Preparing and processing technical and financial reports.
- Organizing teleconferences / project meetings / workshops / conferences.
- Having the overall responsibility for the complete management of the project.
- Appointing the Management Team.

3.3 General Assembly

The General Assembly is the ultimate decision-making body of the consortium, is composed of one representative of each partner of the consortium and chaired by the Project Coordinator. The General Assembly will be free to act on its own initiative to formulate proposals and make decisions in accordance with the procedures set out in the Consortium Agreement. In addition, all proposals made by the Executive Board will be considered and decided upon by the General Assembly. More specifically, the main activities of the General Assembly are to:

- Approve proposed changes in Annexes 1 and 2 of the Grant Agreement to be agreed by the Funding Authority.
- Approve changes in the Consortium Plan.
- Approve the entry of a new Party to the consortium.
- Identify a breach by a Party of its obligations under the Consortium Agreement or the Grant Agreement.
- Declare a Party to be a defaulting partner.
- Approve the withdrawal of a Party from the consortium in case of defaulting partners.
- Propose to the Funding Authority for a change of the Coordinator.
- Propose to the Funding Authority a suspension of all or part of the project.

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- Propose to the Funding Authority the termination of the project and the Consortium Agreement.

3.4 Executive Board

The Executive Board is the supervisory body for the execution of the Project and consists of the Project Coordinator, the Project Manager and members of the Work Package leading partners appointed by the General Assembly. The Executive Board is mainly responsible for:

- Preparing the meetings, proposing decisions and preparing the agenda of the General Assembly.
- Monitoring the proper execution and implementation of decisions of the General Assembly.
- Collecting information at least once every 6 months for the project progress, examining that information to assess the compliance of the Project with the Consortium Plan and, if necessary, proposing modifications of the Consortium Plan to the General Assembly.
- Agreeing on the Members of the Management Team, upon a proposal by the Coordinator.
- Supporting the Coordinator in preparing meetings with the Funding Authority and in preparing related data and deliverables.
- Preparing the content and timing of press releases and joint publications by the consortium or proposed by the Funding Authority in respect to the procedures of the Grant Agreement Article 29.

3.5 External Expert Advisory Board

The role of External Expert Advisory Board (EEAB) members is to shed light on critical decisions to be made at project level including the potential exploitation routes of the project results. The Advisory Board considers the progress of the project and its final results and provides advice to the Project Coordinator and the Executive Board. The Advisory Board is appointed and steered by the Executive Board. The support of the Advisory Board throughout the project duration plays a key role in ensuring high quality outcomes with increased potential replicability in other European cities. The main goals of this board are the following:

- Assist and facilitate decisions made by the General Assembly.
- Provide necessary advice to the consortium to reach the project objectives.
- Monitor major milestones and project risks and provide feedback to overcome them.
- Provide final assessment concerning the project results

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3.6 Ethics Manager

Taking into account the scope of the project activities envisioned involving processing of personal information, as well as the associated requirements set under the General Data Protection Regulation (GDPR) and other applicable regulations and soft law instruments, the Ethics Manager will provide the consortium with additional guidance regarding the ethical implications emerging during the project. TwinERGY legal partner, Arthur's Legal, will be assigned the Ethics Manager position. The Ethics Manager is responsible for:

- Providing constant advice regarding ethical and data protection issues that may arise during the project lifetime.
- Addressing any legal, privacy and ethical issues regarding the technologies developed by the consortium.
- Ensuring that all partners' participation in TwinERGY project complies with the ethical principles and legislation that are described in WP12 and WP13.

3.7 Management Team

The Management Team supports the Executive Board, the Project Coordinator and the Project Manager in executing the decisions of the General Assembly as well as in the day-to-day project management. The Management team is being proposed by the Project Manager and Project Coordinator and appointed by the Executive Board. The most important responsibilities of the Management Team include:

- Monitoring the work progress related to technical and administrative aspects of the project.
- Providing assistance at administrative level to project parties.
- Informing timely the Project Manager about important incidents in everyday project management.
- Contributing to deliverable preparation.

3.8 Pilot Teams and Leaders

Each pilot implementation will have a responsible leader. The project co-ordination will further be strengthened by a local coordinator for each district. The Pilot Leader (PL) has the responsibility of technical, administrative, and financial coordination at pilot level. More specifically, the PL role includes:

- The overall management of the pilot site.
- Monitoring of the technical work of the pilot demonstration.
- Monitoring of resource usage with respect to the initial plan.
- Establishment of communication channels with local pilot partners.

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- Proposal of mitigating measures at pilot level, in case of deviations from the initial workplan, in order to meet project requirements.
- Contribution in preparing project deliverables and ensuring their high-quality level.
- Identification and management of risks in pilot implementation.
- Calling for a pilot meeting whenever is considered necessary.
- Reporting to the Executive Board.

3.9 Work Package Teams and Leaders

The Work Package Leader (WPL) will ensure the coordination among the different project teams that collaborate within each Work Package and the effective exchange of intermediate results among Work Packages. They will ensure timely execution of tasks in each Work Package and stimulating the interaction between the various partners involved. The WPL is responsible for:

- Orchestrating and supervising multiple tasks and activities within the WP.
- Proposing workplan modifications, if such a need arises, to the Executive Board.
- Informing the Project Manager about the progress of each task within the WP.
- Calling progress meetings, if needed, to inform all WPLs, the Project Manager and the Project Coordinator about important issues that may have arisen.
- Contributing to deliverable preparation and assuring their high-quality level.
- Reporting to the Executive Board.

3.10 Task Leaders

The management responsibility for each task in a Work Package is attributed to the appointed partner, who nominates an individual as Task Leader. The Task Leader (TL) is responsible for coordinating and reporting the work done by all participants in the task. At the starting date of the task, the Task Leader appoints specific roles and responsibilities to each supportive partner involved in the task. The Task Leader presents the task progress when required to the Work Package Leader.

3.11 Data Monitoring Committee

The TwinERGY Data Monitoring Committee (DMC) is an informal subgroup consisting of partners working in parallel as an advisor to the project Executive Board in regard to Data Management. Its introduction and main purpose is to monitor the data management and handling procedures in all components and processes of the project. This committee consists of members of the following bodies:

1. Project Data Manager
2. Ethics Manager

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3. Data Protection Coordinator
4. Data Protection Officers
5. Project Management Team (for the purpose of supporting the DMC activities and the communication with the Executive Board).

DMC role and responsibilities are presented in detail in the deliverable D1.2 "Data Management Plan – Revision 2" that was released in M16.

3.12 Project Data Manager

The Project Data Manager (PDM) is responsible for the initial screening of external stakeholder requests for access and re-use of raw demo data that are available in the data management platform. The PDM will bring all requests to the attention of the Data Monitoring Committee (DMC), which will have to provide their suggestion to the Executive Board regarding the extent that these requests can be satisfied. The role of the Project Data Manager is assigned to the consortium partner SUITE5, the responsible partner for the Common Data Management Platform, which will be developed as part of the WP5 work. PDM role and responsibilities are presented in detail in the deliverable D1.2 "Data Management Plan – Revision 2" that was released in M16.

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4. Project Planning and Resources

TwinERGY is a 36-month project whose working plan and resources are aligned with the project vision and are planned in a way that ensures the achievement of high-quality outcomes. The working plan in terms of tasks, scheduling, milestones, and deliverables as well as related resources has been agreed in the Grant Agreement. The workplan presented below includes all modifications made to the initial one as described in the GA up until M18 (April 30th, 2022) of the project.

4.1 Working Plan

The TwinERGY project foresees the submission of 62 deliverables that are linked to 13 main WPs addressing the following topics:

- WP1: Project Management and Quality Assurance
- WP2: Stakeholder Requirements Obstacles to Innovation and Business Models
- WP3: Cooperation with projects supported under LC-SC3-ES-5-2018-2020 and other selected projects
- WP4: Methodological Framework and Architecture Design
- WP5: Data Collection and Communication Platform
- WP6: Development of Digital Twin Platform & System dynamics
- WP7: Development of TwinERGY System Modules
- WP8: TwinERGY System Integration
- WP9: Pilots
- WP10: Exploitation and Business Plans
- WP11: Dissemination and Communication
- WP12: Ethics, Legislation and Standardization
- WP13: Ethics Requirements

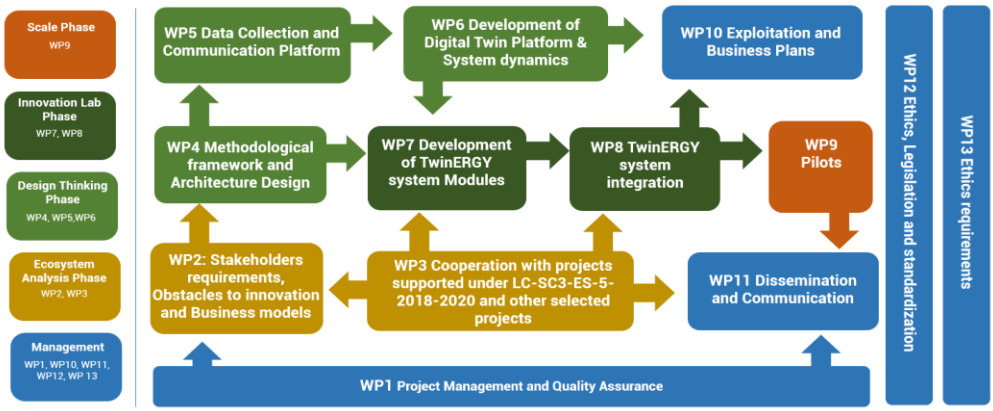

Figure 2. High level relationship between the Work Packages

The Work Break down Structure and the project schedule have been broken down at a WP level including the individual tasks, deliverables and milestones. Moreover, they

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include the lead beneficiaries, the task and deliverable leaders as well as the support partners that contribute to each task. The notation that is used for the project schedule is presented below:

Figure 3. Gantt Chart notations

4.1.1 WP1: Project Management and Quality Assurance

Work Package 1 (Leader: UoP) employs a range of established and trusted project management techniques to achieve key operational objectives: the consortium in unison to realize all ambitions set out in the project vision; the overall performance of the project is regularly monitored to ensure all outputs are delivered on time and on budget; the quality criteria for all results are met and any risks or issues are mitigated in the most effective way as quickly as possible; project expenses and resources are spent according to the terms specified in the grand agreement; efficient functioning of the consortium is achieved through the sound documentation and internal communication systems; the image of the TwinERGY project externally is that of an ethical project dedicated to uphold European values in all their manifestations, from gender equality to respect for the environment.

Table 4. WP1 work breakdown structure

	Project Management and Quality Assurance	**Months**	**Task Leaders**	**Support Partners**
WP1	T1.1 Project Management and Quality Assurance	1-36	UoP	TH OWL, UNIVBRIS
	T1.2 European Commission Reporting	13-14 25-26 36	UoP	ED LUXEMBOURG, ARTHUR'S LEGAL, smartEN
	T1.3 Administrative and Financial Report	1-36	UoP	UNIVBRIS
	T1.4 Consortium Meetings	12 24 35-36	UoP	STAM SRL, TH OWL, UNL, IES R&D, BENETUTTI, UNIVBRIS, KWMC,

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				SUITE5, ETRA, MYTILINEOS, BCC, ED, Stadt Steinheim, IFC, ARTHUR'S LEGAL, smartEN
	T1.5 Knowledge Management & IPR	4-36	UoP	SUITE5, ARTHUR'S LEGAL

Table 5.WP1 list of deliverables

Deliverable Number	Deliverable Title	Lead beneficiary	Type	Dissemination level	Due Date (in months)
D1.1	Project Management Handbook	UoP	Report	Public	6
D1.2	Data Management Plan	UoP	ORDP: Open Research Data Pilot	Public	6
D1.2	Data Management Plan – Revision 1	UoP	ORDP: Open Research Data Pilot	Public	10
D1.2	Data Management Plan – Revision 2	UoP	ORDP: Open Research Data Pilot	Public	16
D1.2	Data Management Plan – Revision 3	UoP	ORDP: Open Research Data Pilot	Public	28
D1.2	Data Management Plan – Revision 4	UoP	ORDP: Open Research Data Pilot	Public	36
D1.3	Quality	UoP	Report	Public	6

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	Assurance Plan				
D1.4	IPR Roadmap	UoP	Report	Public	36
D1.5	Project Management Plan	UoP	Report	Public	2
D1.6	Project Management Plan -Revision 1	UoP	Report	Public	18
D1.7	Project Management Plan -Revision 2	UoP	Report	Public	36

Table 6. WP1 list of milestones

Milestone Number	Milestone Title	Lead beneficiary	Due Date (in months)
MS7	Project Completion	UoP	36

4.1.2 WP2: Stakeholder Requirements, Obstacles to Innovation and Business Models

Work Package 2 (Leader: WEC) describes the requirements needed for reaching the TwinERGY project objectives and the use-cases scenarios and KPIs associated with the integration of the technologies and solutions. Furthermore, it aims at developing fully optimized business models, being demonstrated and validated against customer engagement requirements and stakeholders needs, with proof of replicability beyond current project funding. Input from consumer feedback from pilots and trials will inform the final review and documentation of business models and scenarios that will be put forward as an exemplar in the respective deliverables.

Table 7. WP2 work breakdown structure

WP2	Stakeholder Requirements, Obstacles to	Months	Task Leaders	Support Partners

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	Innovation and Business Models			
	T2.1 Citizen Engagement and Co-design Framework and Guidance	1-6	KWMC	TH OWL, BENETUTTI, UNIVBRIS, MYTILINEOS, IFC
	T2.2 Stakeholders Requirement	1-6	UNL	UoP, STAM SRL, TH OWL, BENETUTTI, UNIVBRIS, KWMC, SUITE5, ETRA, WEC P.L.C., MYTILINEOS, BBC, ED LUXEMBOURG, Stadt Steinheim, IFC
	T2.3 Business Models Analysis	3-8	WEC P.L.C.	STAM SRL, TH OWL, UNL, BENETUTTI, KWMC, MYTILINEOS, BCC, Stadt Steinheim, IFC
	T2.4 Analysis of Social, Ethical and Cultural Barriers to Innovation	1-8	smartEN	UoP, TH OWL, UNL, BENETUTTI, KWMC, BCC, Stadt Steinheim, IFC, ARTHUR'S LEGAL
	T2.5 Technical Barriers Analysis	1-6	ED LUXEMBOURG	UoP, STAM, TH OWL, SUITE5, ETRA, WEC P.L.C.

Table 8. WP2 list of deliverables

Deliverable Number	Deliverable Title	Lead beneficiary	Type	Dissemination level	Due Date (in months)
D2.1	Best practice guidelines for engaging citizens in the	KWMC	Report	Public	8

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	pilots and metrics for diversity and inclusion				
D2.2	Stakeholders Analysis: KPIs, Scenarios and Use Case Definition	UNL	Report	Public	8
D2.3	Business Models & Incentive Schema Definition	WEC P.L.C.	Report	Public	8
D2.4	Technical Obstacles to Innovation Analysis	ED LUXEMBOURG	Report	Public	8
D2.5	Social, Ethical and Cultural Barriers to Innovation	smartEn	Report	Public	8

Table 9. WP2 list of milestones

Milestone Number	Milestone Title	Lead beneficiary	Due Date (in months)
MS1	Site Demonstration Design	UoP	6
MS7	Project Completion	UoP	36

4.1.3 WP3: Cooperation with Projects Supported Under LC-SC3-ES-5-2018-2020 and Other Selected Projects

The main goal of Work Package 3 (Leader: ED) is the establishment of cooperation with projects supported under the H2020 umbrella in order to make good use of the experience gained during the project implementation phase, utilize tools and technologies developed in there or further analyze and reclaim their results towards achieving more accurate results during TwinERGY implementation. Another specific objective of this WP is the establishment of cooperation with projects supported under LC-SC3-ES-520018-2020 taking advantage of the results reported.

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Table 10. WP3 work breakdown structure

	Cooperation with Projects Supported under LC-SC3-ES-5-2018-2020 and Other Selected Projects	Months	Task Leaders	Support Partners
WP3	T3.1 Utilization of other projects' results funded under complementary topics and similar projects through the BRIDGE initiative	1-36	ED LUXEMBOURG	UoP, STAM SRL, TH OWL, UNL, IES R&D, UNIVBRIS, KWMC, SUITE5, ETRA, WEC P.L.C., BCC, IFC, smartEN
	T3.2 Cooperation with projects supported under LC-SC3-ES-5-2018-2020	1-36	ED LUXEMBOURG	UoP, ETRA, MYTILINEOS

Table 11. WP3 list of deliverables

Deliverable Number	Deliverable Title	Lead beneficiary	Type	Dissemination level	Due Date (in months)
D3.1	TwinERGY – European Projects Innovation and Cooperation Roadmap	ED LUXEMBOURG	Report	Public	8
D3.2	TwinERGY – European Projects Innovation and Cooperation Report	ED LUXEMBOURG	Report	Public	36

Table 12. WP3 list of milestones

Milestone Number	Milestone Title	Lead beneficiary	Due Date (in months)

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MS7	Project Completion	UoP	36

4.1.4 WP4: Methodological Framework and Architecture Design

The objective of Work Package 4 (Leader: TH OWL) is to identify the diverse values that end customers hold and the context in which the live that make them respond differently to the approach adopted by the project. The project will therefore generate a system development methodology that can analyze behavior attitudes and classify or segregate end-customers, beyond the identification of basic consumption levels.

Table 13. WP4 work breakdown structure

	Methodological Framework and Architecture Design	**Months**	**Task Leaders**	**Support Partners**
WP4	T4.1 Consumers' Behavioral Analysis	2-10	UNL	UoP, BENETUTTI, WEC P.L.C., IFC
	T4.2 Consumer Engagement Strategies Assessment and Development	2-11	UNL	STAM SRL, TH OWL, BENETUTTI, UNIVBRIS, WEC P.L.C., IFC
	T4.3 Methodological Framework, Design and Development	2-8	UNIVBRIS	UoP, IES R&D, SUITE5, ETRA, WEC P.L.C., ED LUXEMBOURG
	T4.4 System Architecture Design	5-13	ETRA	STAM SRL, TH OWL, IES R&D, SUITE5, WEC P.L.C., ED LUXEMBOURG

Table 14. WP4 list of deliverables

Deliverable Number	**Deliverable Title**	**Lead beneficiary**	**Type**	**Dissemination level**	**Due Date (in months)**
D4.1	Consumers Behavioral Analysis	UNL	Report	Public	10
D4.2	Consumer Engagement Plan	UNL	Report	Public	11
D4.3	Methodologic	UNIVBRIS	Report	Public	10

	al Framework				
D4.4	System Architecture	ETRA	Report	Public	13

Table 15. WP4 list of milestones

Milestone Number	Milestone Title	Lead beneficiary	Due Date (in months)
MS7	Project Completion	UoP	36

4.1.5 WP5: Data Collection and Communication Platform

In Work Package 5 (Leader: SUITE5), the underlying energy data, ontologies and semantic vocabularies will be reviewed in order to design the TwinERGY common information model, while defining a lifecycle approach for effectively managing its evolution. The WP aims to develop the TwinERGY backbone infrastructure of the Core Data Management Platform (CDMP), to deliver the data-at-rest and data-in-motion ingestion, management and curation services, and to develop the end-to-end security, encryption and privacy assurance services in accordance with the requirements elicited for the energy domain.

Table 16. WP5 work breakdown structure

	Data Collection and Communication Platform	Months	Task Leaders	Support Partners
WP5	T5.1 Open Standards Review and Common Information Model Adaption	3-10	SUITE5	UoP, STAM SRL, TH OWL, IES R&D, UNIVBRIS, ETRA, WEC P.L.C., ED LUXEMBOURG
	T5.2 Data Management Platform Backbone Infrastructure	4-32	SUITE5	UoP, TH OWL, IES R&D, ETRA, ED LUXEMBOURG
	T5.3 Core Data Ingestion, Curation and Management Services	5-28	SUITE5	UoP, TH OWL, IES R&D, ETRA, ED LUXEMBOURG
	T5.4 Data Security Encryption and Privacy Mechanisms	3-28	SUITE5	UoP, IES R&D, ETRA, WEC P.L.C., ED LUXEMBOURG,

Table 17. WP5 list of deliverables

Deliverable Number	Deliverable Title	Lead beneficiary	Type	Dissemination level	Due Date (in months)
D5.1	TwinERGY Common Information Model	SUITE5	Report	Public	10
D5.2	Data Collection, Security, Storage & Management Services Bundles – Beta Release	SUITE5	Other	Public	14
D5.3	TwinERGY Integrated Data Management Platform – Alpha, Mock-ups Release	SUITE5	Other	Public	14
D5.4	TwinERGY Integrated Platform– Beta Release	SUITE5	Other	Public	16
D5.5	Data Collection, Security, Storage & Management	SUITE5	Other	Public	20
D5.6	TwinERGY Integrated Data Management Platform– Release 1.00	SUITE5	Demonstrator	Public	24
D5.7	Data Collection,	SUITE5	Demonstrator	Public	28

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	Security, Storage & Management Services Bundles – Release 2.00 5				
D5.8	TwinERGY Integrated Data Management Platform– Release 2.00	SUITE5	Demonstrator	Public	32

Table 18. WP5 list of milestones

Milestone Number	Milestone Title	Lead beneficiary	Due Date (in months)
MS4	System Modules Integration	ETRA	19
MS7	Project Completion	UoP	36

4.1.6 WP6: Development of Digital Twin Platform & System Dynamics

In Work Package 6 (Leader: IES), the design and development of the consumer and communities Digital Twins and respective models will be put into practice, based on the work undergoing as part of the WP4 tasks. The interlink between the consumer and the community Digital Twins will be developed and the Digital twins will connect to the Transactive Energy Platform. TwinERGY will develop an integrated (micro - macro scale) Digital Twin solution focusing on special aspects of the corresponding physical assets.

Table 19. WP6 work breakdown structure

	Development of Digital Twin Platform & System Dynamics	Months	Task Leaders	Support Partners
WP6	T6.1 System Dynamics and Asset Interdependencies	3-12	UNIVBRIS	UoP, IES R&D
	T6.2 Demand Flexibility Models Design and Development	4-14	IES R&D	UoP, STAM SRL, TH OWL, UNIVBRIS, SUITE5, WEC

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				P.L.C.
	T6.3 Consumer Digital Twin (CDT) Design and Development	3-18	UoP	STAM SRL, TH OWL, IES R&D, UNIVBRIS, SUITE5
	T6.4 Digital Twin Interconnected Platform Design and Development	3-18	IES R&D	UoP, STAM SRL, TH OWL, UNIVBRIS, SUITE5

Table 20. WP6 list of deliverables

Deliverable Number	Deliverable Title	Lead beneficiary	Type	Dissemination level	Due Date (in months)
D6.1	System Dynamics Models	UNIVBRIS	Other	Public	15
D6.2	Demand Flexibility Models	IES R&D	Other	Public	16
D6.3	Customer Digital Twin	UoP	Other	Public	18
D6.4	Digital Twin Interconnected Platform	IES R&D	Other	Public	18

Table 21. WP6 list of milestones

Milestone Number	Milestone Title	Lead beneficiary	Due Date (in months)
MS2	Digital Twin Interconnected Platform Runs Demand Flexibility Optimizations	IES R&D	10
MS7	Project Completion	UoP	36

4.1.7 WP7: Development of TwinERGY System Modules

TwinERGY ecosystem will consist of several modules that will work on a complementary basis. Work Package 7 (Leader: UoP) aims to develop these modules and provide the consumers with various services based on data analysis of their closed environment. The different modules created under this WP will be compliant to the system architecture, providing the ability for interconnection.

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Table 22. WP7 work breakdown structure

	Development of TwinERGY System Modules	Months	Task Leaders	Support Partners
WP7	T7.1 Modules' Specifications and System Interoperability	3-8	ETRA	UoP, STAM SRL, TH OWL, IES R&D, UNIVBRIS, SUITE5, WEC P.L.C., ED LUXEMBOURG
	T7.2 Consumer Comfort / Well-being Module	3-23	UoP	STAM SRL, IES R&D, ETRA
	T7.3 Consumer and Neighbourhood Demand Flexibility Profiling Module	5-18	IES R&D	UoP, STAM SRL, TH OWL, UNIVBRIS, SUITE5, ETRA
	T7.4 Home & Tertiary real-time Energy Monitoring Module	5-18	STAM	TH OWL, IES R&D
	T7.5 DER Management Module	5-18	TH OWL	STAM SRL, IES R&D
	T7.6 TwinEV Module	5-18	ETRA	UoP, UNL, UNIVBRIS
	T7.7 Transactive Energy Module	5-18	WEC P.L.C.	UoP, SUITE5
	T7.8 Social Network Module	5-18	ED LUXEMBOURG	UoP, UNL, IES R&D, UNIVBRIS, IFC
	T7.9 Risk Management and Event Handling Module	5-18	STAM SRL	UoP

Table 23. WP7 list of deliverables

Deliverable Number	Deliverable Title	Lead beneficiary	Type	Dissemination level	Due Date (in months)
D7.1	Modules' Interoperability	ETRA	Report	Public	8
D7.2	Consumer Well-being	UoP	Demonstrator	Public	18,23

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	Module				
D7.3	Home & Tertiary Real-time Energy Monitoring Module	STAM SRL	Other	Public	18
D7.4	Consumer and Neighbourhood Demand Flexibility Profiling Module	IES R&D	Other	Public	18
D7.5	RES Integration and DER Management Module	TH OWL	Other	Public	18
D7.6	Electric Mobility as a Service Module	ETRA	Other	Public	18
D7.7	Transactive Energy Module	WEC P.L.C.	Other	Public	18
D7.8	Customer Deployment and Social Engagement Module	ED LUXEMBOURG	Other	Public	18
D7.9	Risk Management and event handling Module	STAM SRL	Other	Public	18

Table 24. WP7 list of milestones

Milestone Number	Milestone Title	Lead beneficiary	Due Date (in months)
MS5	Business Plan	UoP	19

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	Development		
MS7	Project Completion	UoP	36

4.1.8 WP8: TwinERGY System Integration

Work Package 8 (Leader: ETRA) has the objective to deliver the TwinERGY system by integrating all the components, integrate the TwinERGY solution with the underlying components in a Smart Grid setup, and install the system for operation at the different pilot sites.

Table 25. WP8 work breakdown structure

	TwinERGY System Integration	Months	Task Leaders	Support Partners
WP8	T8.1 TwinERGY Integration with Field Devices and Disturbed Smart Grid Assets	14-27	ETRA	UoP, STAM SRL, IES R&D, BENETUTTI, UNIVBRIS, SUITE5, MYTILINEOS, BCC, ED LUXEMBOURG, Stadt Steinheim
	T8.2 TwinERGY System Modules Integration and Lab-testing	14-24	ETRA	UoP, STAM SRL, IES R&D, UNIVBRIS, SUITE5, WEC P.L.C., ED LUXEMBOURG
	T8.3 TwinERGY System Final Version	25-36	ETRA	UoP, STAM SRL, IES R&D, UNIVBRIS, SUITE5, WEC P.L.C., ED LUXEMBOURG

Table 26. WP8 list of deliverables

Deliverable Number	Deliverable Title	Lead beneficiary	Type	Dissemination level	Due Date (in months)
D8.1	TwinERGY Connectors to Distributed Smart Grid	ETRA	Demonstrator	Public	18,27

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	Assets and Respective APIs				
D8.2	TwinERGY Pre-trial Validation Testing Scenarios and Results	ETRA	Report	Public	24
D8.3	TwinERGY Integrated Solution	ETRA	Demonstrator	Public	24,36

Table 27. WP8 list of milestones

Milestone Number	Milestone Title	Lead beneficiary	Due Date (in months)
MS4	System Modules Integration	ETRA	19
MS6	Finalization of TwinERGY System	UoP	25
MS7	Project Completion	UoP	36

4.1.9 WP9: Pilots

Work Package 9 (Leader: UoP) aims at the establishment of four pilot projects, which can be used to implement, evaluate and validate the TwinERGY system in real-world scenarios, demonstrate benefits that can be achieved with TwinERGY to the wide audience, enhance customer engagement and present scalability of the project. Before pilot implementation, the consortium will focus on providing the pilot testing leading partners with guidelines, that will assure the quality of the data analyzed and the results produced. Having developed a co-design approach with consumer and identified the requirements of the stakeholders recognized in WP2, the Pilots will be implemented in this work package and lead to the demonstration process. Further, the expectations and objectives of the pilots will be gathered, serving as additional input for WP7 and WP8, which will provide the TwinERGY ecosystem.

Table 28. WP9 work breakdown structure

WP9	Pilots	Months	Task Leaders	Support Partners
	T9.1 Pilot Specifications and Quality Assurance	5-10	UNIVBRIS	UoP, STAM SRL, TH OWL, UNL,

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				BENETUTTI, SUITE5, MYTILINEOS, BCC, Stadt Steinheim
	T9.2 Pilot Management Plan Development	6-10	UoP	TH OWL, UNL, BENETUTTI, UNIVBRIS, MYTILINEOS, BCC, Stadt Steinheim
	T9.3 Pilot Demonstrations Implementation	10-36	UoP	TH OWL, UNL, BENETUTTI, UNIVBRIS, KWMC, ETRA, MYTILINEOS, BCC, Stadt Steinheim, IFC
	T9.4 Pilot Validation Impact Realization & Recommendations	16-36	UoP	TH OWL, UNL, BENETUTTI, UNIVBRIS, KWMC, MYTILINEOS, BCC, Stadt Steinheim
	T9.5 Continuous Documentation of Pilots' Activities	5-36	IFC	TH OWL, BENETUTTI, KWMC, MYTILINEOS, BCC

Table 29. WP9 list of deliverables

Deliverable Number	Deliverable Title	Lead beneficiary	Type	Dissemination level	Due Date (in months)
D9.1	Pilot Quality Assurance Guide	TH OWL	Report	Public	10
D9.2	General Pilot Management Plan	TH OWL	Report	Public	10
D9.3	Report of TwinERGY	UoP	Report	Public	36

	Ecosystem and Module Benchmarking on Real Life Testing				
D9.4	Pilot Demonstration Impact and Recommendations	UoP	Report	Public	36

Table 30. WP9 list of milestones

Milestone Number	Milestone Title	Lead beneficiary	Due Date (in months)
MS1	Site Demonstrations Design	UoP	6
MS3	Pilot Demonstration Start	UoP	10
MS6	Finalization of TwinERGY System	UoP	25
MS7	Project Completion	UoP	36

4.1.10 WP10: Exploitation and Business Plans

The objective of Work Package 10 (Leader: UNIVBRIS) is to elaborate sector business analysis in order to provide industrial partners participating in the pilots an overview of business opportunities, conducted based on the market assessment methods. This work package is oriented to those industrial partners that will have to exploit the results, delivering a sectorial business analysis that will provide a description of future business opportunities.

Table 31. WP10 work breakdown structure

	Exploitation and Business Plans	Months	Task Leaders	Support Partners
WP10	T10.1 Business Plans Development	19-27	WEC P.L.C.	UoP, UNL, UNIVBRIS, SUITE5, ETRA, MYTILINEOS, smartEN
	T10.2 Business	28-36	UNIVBRIS	UoP, UNL,

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	Opportunity Validation			SUITE5, ETRA, WEC P.L.C., MYTILINEOS, ARTHUR'S LEGAL

Table 32. WP10 list of deliverables

Deliverable Number	Deliverable Title	Lead beneficiary	Type	Dissemination level	Due Date (in months)
D10.1	Business Analysis / Exploitation of Potential Plans	WEC P.L.C.	Report	Public	27
D10.2	Business Opportunities Validation	UNIVBRIS	Report	Public	32

Table 33. WP10 list of milestones

Milestone Number	Milestone Title	Lead beneficiary	Due Date (in months)
MS5	Business Plan Development	UoP	19
MS7	Project Completion	UoP	36

4.1.11 WP11: Dissemination and Communication

Work Package 11 (Leader: UoP) will use awareness raising and dissemination methods to increase the scale and impact of TwinERGY during the project and to ensure a legacy for the outcomes beyond the project end. It will oversee the development and deployment of a multi-pronged approach to communication and dissemination that will raise awareness of the project with policy makers, citizens/consumers, local municipalities, academics and innovation specialists, energy market stakeholders (DSOs/TSOs/Aggregators) and energy service providers. It will also contribute, upon invitation by the INEA, to common information and dissemination activities to increase the visibility and synergies between H2020 supported actions.

Table 34. WP11 work breakdown structure

WP11	Dissemination and Communication	Months	Task Leaders	Support Partners

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	T11.1 Visual Identity, Website and Social Media	1-36	IFC	UoP, STAM SRL, TH OWL, UNL, IES R&D, BENETUTTI, UNIVBRIS, KWMC, SUITE5, ETRA, WEC P.L.C., MYTILINEOS, BCC, ED LUXEMBOURG, Stadt Steinheim, ARTHUR'S LEGAL, smartEN
	T11.2 Management of Strategic Communication and Dissemination Activities	1-36	UoP	UNL, BENETUTTI, UNIVBRIS, MYTILINEOS, BCC, Stadt Steinheim, IFC, smartEN
	T11.3 Citizen Learning & Dissemination	1-36	KWMC	UoP, TH OWL, BENETUTTI, UNIVBRIS, KWMC, MYTILINEOS, IFC
	T11.4 Energy Futures Videos	5-36	IFC	TH OWL, BENETUTTI, UNIVBRIS, KWMC, MYTILINEOS
	T11.5 Networking with Related Research Projects and Initiatives	1-36	smartEN	UoP, TH OWL, UNL, UNIVBRIS, KWMC

Table 35. WP11 list of deliverables

Deliverable Number	Deliverable Title	Lead beneficiary	Type	Dissemination level	Due Date (in months)
D11.1	Communication Guidelines, Website, Social Media	IFC	Websites, patents filling, etc.	Public	36
D11.2	Communication and	UoP	Report	Public	3

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	Dissemination Plan				
D11.3	1st European Workshop with Stakeholders	KWMC	Report	Public	25
D11.4	2nd European Workshop with Stakeholders	IFC	Report	Public	35
D11.5	Citizen Learning Activities/Events and Report	KWMC	Report	Public	33
D11.6	Energy Futures Videos	IFC	Websites, patents filling, etc.	Public	34
D11.7	Citizen Engagement Handbook	IFC	Report	Public	36

Table 36. WP11 list of milestones

Milestone Number	Milestone Title	Lead beneficiary	Due Date (in months)
MS7	Project Completion	UoP	36

4.1.12 WP12: Ethics, Legislation and Standardization

The objective of Work Package 12 (Leader: ARTHUR'S LEGAL) is to ensure Regulatory, Legal and Ethics compliance of the project with the respective EU regulations and legislation. Another objective is to develop data use licenses to address any data sharing related issues and prevent them from obstructing the project progress.

Table 37. WP12 work breakdown structure

	Ethics, Legislation and Standardization	Months	Task Leaders	Support Partners
WP12	T12.1 Identification of Legal & Ethics Requirements	1-9	ARTHUR'S LEGAL	UoP, UNL, IFC

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	T12.2 Legal & Ethical Compliance Monitoring	10-36	ARTHUR'S LEGAL	UoP
	T12.3 Regulatory Recommendations and Standardization	29-36	smartEN	UPat, UNL, IFC
	T12.4 Data use licenses	1-3	KWMC	IFC

Table 38. WP12 list of deliverables

Deliverable Number	Deliverable Title	Lead beneficiary	Type	Dissemination level	Due Date (in months)
D12.1	Legal & Ethical Compliance Guide	ARTHUR'S LEGAL	Report	Public	9
D12.2	1st Legal & Ethical Compliance Report	ARTHUR'S LEGAL	Report	Public	24
D12.3	2nd Legal & Ethical Compliance Report	ARTHUR'S LEGAL	Report	Public	36
D12.4	Regulatory Recommendations and Standardization	smartEn	Report	Public	36
D12.5	Data Use License Template	KWMC	Report	Public	15

Table 39. WP12 list of milestones

Milestone Number	Milestone Title	Lead beneficiary	Due Date (in months)
MS7	Project Completion	UoP	36

4.1.13 WP13: Ethics Requirements

The objective of Work Package 13 (Leader: UoP) is to set out the ethics requirements that the project must comply with.

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Table 40. WP13 list of deliverables

Deliverable Number	Deliverable Title	Lead beneficiary	Type	Dissemination level	Due Date (in months)
D13.1	H - Requirement No. 1	UoP	Ethics	Confidential, only for members of the consortium (including the Commission Services)	3
D13.2	POPD - Requirement No. 2	UoP	Ethics	Confidential, only for members of the consortium (including the Commission Services)	3

Table 41. WP13 list of milestones

Milestone Number	Milestone Title	Lead beneficiary	Due Date (in months)
MS7	Project completion	UoP	36

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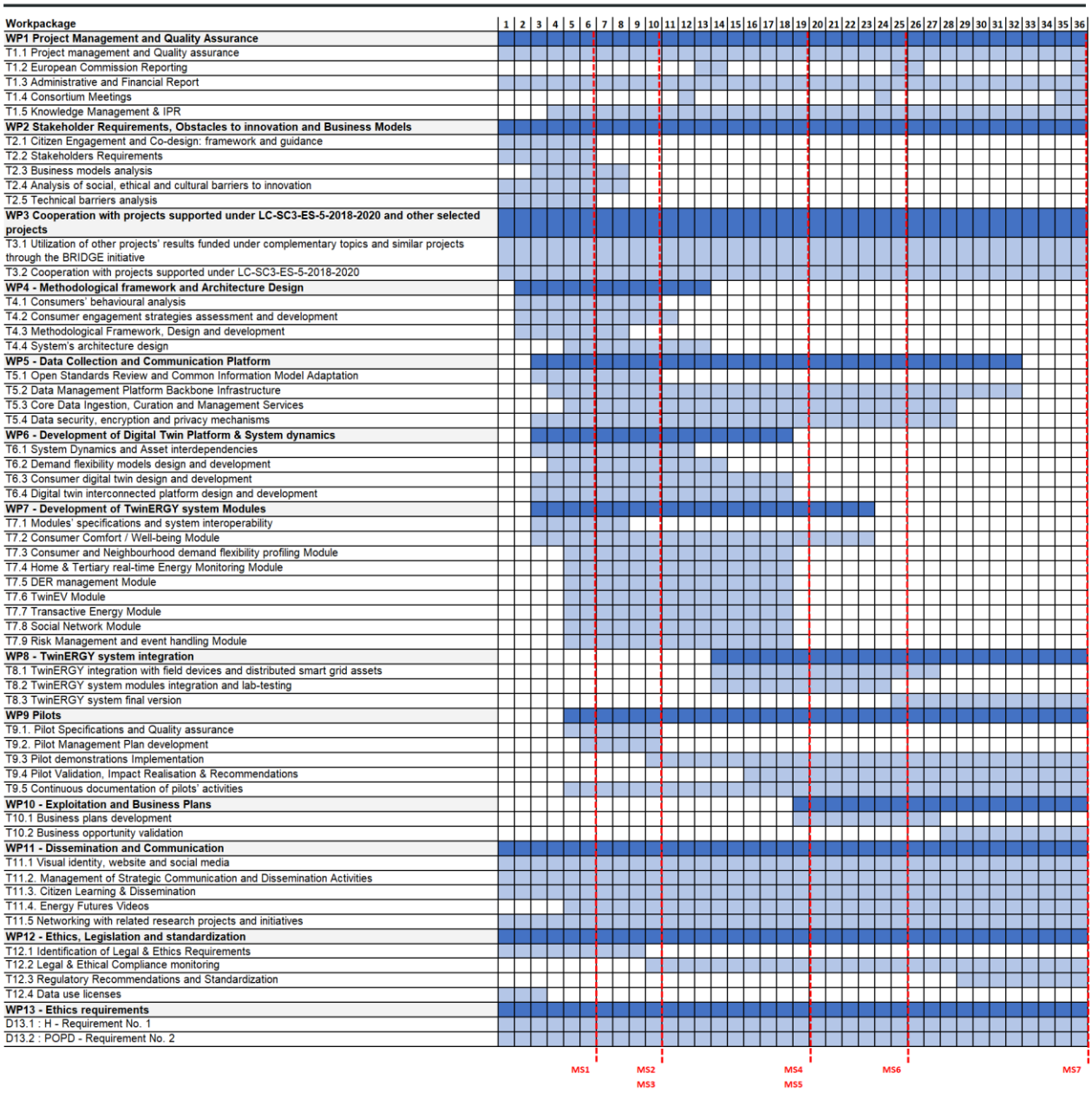

Figure 4. TwinERGY Gantt Chart

4.2 Project Resources to Be Committed

4.2.1 Person Months

Table 42 below presents the Person Month distribution per partner per WP. There are no PMs linked WP13: Ethics Requirements. The highest effort is allocated to WP9 (15.9% of the whole) followed by WP7 (15.2%) and WP8 (9.6%).

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Table 42. PMs allocation per WP and per participant

Participant	WP 1	WP 2	WP 3	WP 4	WP 5	WP 6	WP 7	WP 8	WP 9	WP 10	WP 11	WP 12	Total PMs Per Participant
UoP	20.5	8.5	10	6	3	10	20	4	14	2	8	4	110
STAM SRL	2	2	3	6	3	7	18	10	4	4	4	0	63
TH OWL	3	2	2	9	4	4	12	0	15	0	2	0	53
UNL	2	6	2	10	0	0	3	0	4	2	5	2	36
IES R&D	1.5	0	1	2	3	6	6	3	0	0	1.5	0	24
IES LTD	0	0	0	4	6	10	5	5	0	0	0	0	30
BENETUTTI	2	3	0	2	0	0	0	0	10	0	2	0	19
UNIVBRIS	1.5	2	0.5	5	2	9	4	2	12	6	0.5	0	44.5
KWMC	1.5	5	1	0	0	0	0	0	12	0	7	3	29.5
SUITE5	1.5	4	4	6	26	8	3	10	8	2	2	0	74.5
ETRA	1.5	4	3	7	4	0	18	25	10	4	2	0	78.5
WEC P.L.C	1.5	10	2	4	3	3	18	6	0	6	2	0	55.5
MYTILINEOS	1.5	2	4	0	0	0	0	6	20	4	4	0	41.5
BCC	1.5	1	0.5	0	0	0	0	0	7	0	1	0	11
ED LUXEMBOURGH	1.5	2	10	5	5	0	4.5	6	0	0	4	0	38
EDAT	0	5	0	0	10	0	10.5	0	0	0	0	0	25.5
Stadt Steinheim	1.5	1	0	0	0	0	0	1	6	0	1.5	0	11
IFC	1.5	4	2	5	0	0	2	0	8	0	8	4	34.5
ARTHUR'S LEGAL	4	4	0	0	1	0	0	0	0	1	1	14	25
smartEN	1.5	0	2	0	0	0	0	0	0	1	4	3.5	12
Total PMs	**51.5**	**65.5**	**47**	**71**	**70**	**57**	**124**	**78**	**130**	**32**	**59.5**	**30.5**	**816**

Cooperation with other projects

TwinERGY dedicates WP3 for cooperation with other selected projects and earmarks appropriate resources for coordination and communication efforts and research work associated with cross-cutting issues. Specifically, task T3.1 'Utilization of other projects'

results funded under complementary topics and similar projects through the BRIDGE initiative' and task T3.2 'Cooperation with projects supported under LC-SC3-ES-5-2018-2020' have been allocated a 6% of the total person months.

Policy relevant issues and obstacle to innovation

TwinERGY includes a specific task T2.4 on the analysis of ethical, cultural or social obstacles to innovation, another task T2.5 for technical barriers to innovation, under the current context, as well as tasks on the analysis of future market design, business models (T2.3) and consumer engagement strategies (T2.1). The allocation of person months to these issues is 8%. TwinERGY also dedicates WP12 for standardization of the pilot demonstration results and for ensuring ethics compliance of the project with the respective EU regulations and legislation by allocating a 4% of the total person months.

4.2.2 Project Budget and Allocation to Participants

The total eligible costs of the action are 7,090,310.00 € and the Maximum Grant Amount is 5,903,474.39€. The largest part is allocated to personnel costs (67.6%), followed by other direct costs (11.4%). Figure 5 presents the project budget allocation per participant.

	Estimated eligible[1] costs (per budget category)										EU contribution			Additional information		
	A. Direct personnel costs				B. Direct costs of subcontracting	[C. Direct costs of fin. support]	D. Other direct costs		E. Indirect costs[2]	Total costs	Reimbursement rate %	Maximum EU contribution[3]	Maximum grant amount[4]	Information for indirect costs	Information for auditors	Other information:
	A.1 Employees (or equivalent) A.2 Natural persons under direct contract A.3 Seconded persons [A.6 Personnel for providing access to research infrastructure]		A.4 SME owners without salary A.5 Beneficiaries that are natural persons without salary				D.1 Travel D.2 Equipment D.3 Other goods and services [D.4 Costs of large research infrastructure]	D.5 Costs of internally invoiced goods and services						Estimated costs of in-kind contributions not used on premises	Declaration of costs under Point D.4	Estimated costs of beneficiaries/ linked third parties not receiving funding/ international partners
Form of costs[4]	Actual	Unit[7]	Unit[8]		Actual	Actual	Actual	Unit[9]	Flat-rate[10] 25%							
	a	Total b	No hours	Total c	d	[e]	f	Total g	h = 0.25 x (a +b+c+f+g +[i1]+[i2])	j = g+b+c+d +[e]+f+g+h +[i1]+[i2]	k	l	m	n	Yes/No	
1. UoP	605 000.00	0.00	0.00	0.00	0.00	0.00	98 720.00	0.00	175 930.00	879 650.00	100.00	879 650.00	879 650.00	0.00	No	n/a
2. STAM SRL	346 500.00	0.00	0.00	0.00	0.00	0.00	20 000.00	0.00	91 625.00	458 125.00	70.00	320 687.50	320 687.50	0.00	No	n/a
3. TH OWL	337 080.00	0.00	0.00	0.00	12 000.00	0.00	68 000.00	0.00	101 270.00	518 350.00	100.00	518 350.00	518 350.00	0.00	No	n/a
4. UNL	203 873.00	0.00	0.00	0.00	40 000.00	0.00	15 000.00	0.00	54 718.25	313 591.25	100.00	313 591.25	313 591.25	0.00	No	n/a
5. IES R&D	144 000.00	0.00	0.00	0.00	0.00	0.00	40 000.00	0.00	46 000.00	230 000.00	70.00	161 000.00	161 000.00	0.00	No	n/a
- IES LTD	180 000.00	0.00	0.00	0.00	0.00	0.00	3 000.00	0.00	45 750.00	228 750.00	70.00	160 125.00	160 125.00	0.00	No	n/a
Total beneficiary	324 000.00	0.00	0.00	0.00	0.00	0.00	43 000.00	0.00	91 750.00	458 750.00		321 125.00	321 125.00	n/a	n/a	0.00
6. BENETUTTI	76 000.00	0.00	0.00	0.00	0.00	0.00	101 000.00	0.00	44 250.00	221 250.00	100.00	221 250.00	221 250.00	0.00	No	n/a
7. UNIVBRIS	264 108.00	0.00	0.00	0.00	0.00	0.00	75 000.00	0.00	84 777.00	423 885.00	100.00	423 885.00	423 885.00	0.00	No	n/a
8. KWMC	122 366.00	0.00	0.00	0.00	0.00	0.00	25 200.00	0.00	36 891.50	184 457.50	100.00	184 457.50	184 457.50	0.00	No	n/a
9. SUITE5	464 857.70	0.00	2 670.00	75 267.30	0.00	0.00	38 000.00	0.00	144 531.25	722 656.25	70.00	505 859.38	505 859.38	0.00	No	n/a
10. ETRA	427 825.00	0.00	0.00	0.00	0.00	0.00	15 000.00	0.00	110 706.25	553 531.25	70.00	387 471.88	387 471.88	0.00	No	n/a
11. WEC P.L.C.	282 995.00	0.00	0.00	0.00	0.00	0.00	55 000.00	0.00	84 498.75	422 493.75	70.00	295 745.63	295 745.63	0.00	No	n/a
12. MYTILINEOS	186 750.00	0.00	0.00	0.00	0.00	0.00	55 000.00	0.00	60 437.50	302 187.50	70.00	211 531.25	211 531.25	0.00	No	n/a
13. BCC	140 162.00	0.00	0.00	0.00	31 855.00	0.00	39 000.00	0.00	44 790.50	255 807.50	100.00	255 807.50	255 807.50	0.00	No	n/a
14. ED LUXEMBOURG	281 200.00	0.00	0.00	0.00	0.00	0.00	12 000.00	0.00	73 300.00	366 500.00	70.00	256 550.00	256 550.00	0.00	No	n/a
- EDAT	127 500.00	0.00	0.00	0.00	0.00	0.00	10 000.00	0.00	34 375.00	171 875.00	70.00	120 312.50	120 312.50	0.00	No	n/a
Total beneficiary	408 700.00	0.00	0.00	0.00	0.00	0.00	22 000.00	0.00	107 675.00	538 375.00		376 862.50	376 862.50	n/a	n/a	0.00
15. Stadt Steinheim	59 356.00	0.00	0.00	0.00	0.00	0.00	98 000.00	0.00	39 339.00	196 695.00	100.00	196 695.00	196 695.00	0.00	No	n/a
16. IFC	172 500.00	0.00	0.00	0.00	0.00	0.00	15 000.00	0.00	46 875.00	234 375.00	70.00	164 062.50	164 062.50	0.00	No	n/a
17. ARTHUR'S LEGAL	197 500.00	0.00	0.00	0.00	0.00	0.00	15 000.00	0.00	53 125.00	265 625.00	70.00	185 937.50	185 937.50	0.00	No	n/a
18. smartEn	100 404.00	0.00	0.00	0.00	0.00	0.00	12 000.00	0.00	28 101.00	140 505.00	100.00	140 505.00	140 505.00	0.00	No	n/a
Total consortium	4 719 976.70	0.00		75 267.30	83 855.00	0.00	809 920.00	0.00	1 401 291.00	7 090 310.00		5 903 474.39	5 903 474.39			0.00

Figure 5. TwinERGY budget allocation per participant

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5. Quality Assurance

One of the most important activities within the Project Management effort is to design quality assurance procedures and structures that will ensure that the project satisfies its requirements and achieves its full objectives. All relevant procedures will be summarized in D1.3 'Quality Assurance Plan', which will be developed in the beginning of the project and will be submitted by the 30th of April 2021. The project consortium is deeply committed on assuring high quality results and, for that reason, quality assurance will be the joint responsibility of all project partners at all levels. In this context, the following measures and tools have been identified in the TwinERGY project.

5.1 Internal Communication

The TwinERGY framework for internal communication includes all standard methods, such as e-mails, teleconferences, skype calls, and face to face meetings, maximizing interaction and knowledge transfer between partners to ensure the project success. If any communication issues are identified, the Project Coordinator will intervene to propose solutions and facilitate the opening of direct and fluent communication channels among partners.

5.1.1 Documents Repository

Google Drive will be used as the project document repository, meeting the needs for daily management, effective administration and collaboration among multiple institutions. It will host documents from different phases of the project, from the preparation and submission of the TwinERGY proposal to its implementation. Having access to such documents, containing important information both for archived processes and ongoing activities, will support the consortium to collaborate across WPs and submit high-quality deliverables. All project partners will have free access to the Google Drive folders.

5.1.2 Platform

The internal communication strategy will focus on maximizing interaction and knowledge transfer among partners to ensure the success of the project. Adopting Microsoft Teams platform ensures that there is a smooth communication flow among the project participants who are physically far apart from each other. Microsoft Teams enables participants to exchange immediate messages, collaborate on files, develop smaller team channels with people who work together under a specific task and attend virtual meetings.

5.1.3 Language

The formal project language is English. Project deliverables, internal and/or internal reports, as well as minutes of project meetings must be prepared in English.

5.1.4 Files Naming

In order to realize a smooth collaboration along the 36-month project, all partners should follow a standard file format accordingly to the following naming convention:

TwinERGY_[WPi]_[Di/Ti]_ [Description]_[Versioni.i]_[Date].[Ext]

where:

[WPi] work package identifier (e.g., "WP1"), if applicable,
[Di/Ti] deliverable identifier (e.g., "D1.1") or Task identifier (e.g., "T1.1"), if applicable,
[Description] short file description (e.g., "financial report"),
[Versioni.i] two digits identifier indicating draft version (e.g., "v01"),
[Date] date, following the "daymonthyear" format (ddmmyy),
[Ext] extension of the file name (e.g., ".pdf").

5.2 Planning Meetings

TwinERGY project has established five major meeting categories (along with Kick-off meeting and final meeting) that are designed to monitor the fulfilment of the work programme, the achieved work progress and the quality of the results obtained by the project based on the general objectives of the project proposal. These meetings will provide the necessary assistance in coordinating the consortium, consisted of 18 institutions, while providing the opportunity to address any administrative or financial issues that may arise during the project implementation.

5.2.1 TwinERGY Meeting Plan

Table 43 presents the TwinERGY meeting plan which describes the different categories of meetings, their scheduling structure throughout project implementation and the respective attendees.

Table 43. TwinERGY project meeting plan

Meeting type	Scheduling	Attendees	Extraordinary meeting
KICK-OFF MEETING	25th - 26th of November 2020	• All partners	-
GENERAL ASSEMBLY	Every 6 months	• Project Coordinator	At any time upon

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MEETINGS	(M6, M12, M18, M24, M30, M36)	• Project Manager • One representative per partner	written request of the Executive Board, or of 1/3 of the General Assembly Members or of the Coordinator if deemed necessary.
EXECUTIVE BOARD MEETINGS	Every 4 months (M4, M8, M12, M16, M20, M24, M28, M32, M36)	• Project Coordinator • Project Manager • Maximum of two representatives per partner leading a WP	At any time upon written request of any Member of the Executive Board.
PROGRESS MEETINGS	Every first week of the month	• Project Coordinator • Project Manager • Every WPL who has active tasks	At any time upon written request of any Work Package Leader.
PILOT MEETINGS	Every month	• Project Coordinator • Project Manager • Pilot Leaders	At any time upon written request of any Pilot Leader.
COMMUNICATION MEETINGS	Every 2 months	• Project Coordinator • WP11 leader • 1 communication leader per partner	At any time upon written request
FINAL MEETING	M36	• Project Coordinator • Project Manager • One representative per partner	-

5.2.2 Meeting Procedures

5.2.2.1 MODE OF MEETINGS

TwinERGY meetings will be held on-line where appropriate via secure video conferencing software. However, key meetings, such as the annual General Assembly meeting, will be in person, where circumstances and safety allow it (e.g., possible restrictions in attending face-to-face meetings due to covid-19 pandemic).

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5.2.2.2 NOTICE OF A MEETING

The chairperson of a Consortium Body will send a meeting notice in writing to each Member of that Consortium Body as soon as possible and no later than the minimum number of days preceding the meeting as indicated below.

Table 44. Notice of TwinERGY meetings

Meeting type	Ordinary meeting	Extraordinary meeting
General Assembly Meeting	45 calendar days	15 calendar days
Executive Board Meeting	28 calendar days	7 calendar days
Progress Meeting	10 calendar days	2 calendar days
Pilot Meeting	10 calendar days	2 calendar days
Communication Meeting	10 calendar days	2 calendar days

5.2.2.3 SENDING THE AGENDA

The chairperson of a Consortium Body will prepare and send each Member of the Consortium Body a written (original) agenda no later than the minimum number of days preceding the meeting as indicated below.

Table 45. Sending the agenda for TwinERGY meetings

General Assembly Meeting	21 calendar days, 10 calendar days for an extraordinary meeting
Executive Board Meeting	14 calendar days
Progress Meeting	7 calendar days
Pilot Meeting	7 calendar days
Communication Meeting	7 calendar days

5.2.2.4 MEETING MINUTES

The meeting minutes will be developed following the guidelines below:

- The chairperson of a Consortium Body will produce written minutes of each meeting which will be the formal record of all decisions made. He will send the draft minutes to all Members within 15 calendar days of the meeting.
- The minutes will be considered as accepted if, within 15 calendar days from sending, no Member has sent an objection in writing to the chairperson with respect to the accuracy of the draft minutes.

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- The chairperson will send the accepted minutes to all the Members of the Consortium Body and to the Coordinator, who will safeguard them. If requested, the Coordinator will provide authenticated duplicates to Parties.

5.3 Deliverable Preparation & Submission

Deliverables are the main outputs of TwinERGY and are of a great importance for the EC's evaluation about the progress of the project, since they are the technical documents that contain the analysis of the produced results. Each deliverable should be submitted to EC according to the schedule included in the DoA. The project team, aiming to achieve quality production for each one of the 62 deliverables that have been identified in the DoA, assigns the following roles and responsibilities for the preparation and submission of such documents.

Table 46. Roles and responsibilities in the deliverable preparation process

Role	Responsibility
Deliverable Leader	The Deliverable Leader continuously monitors the deliverable preparation while taking into account the deadline for submission and the required time for review(s). The DL supports internal communication within the task that the deliverable is linked to and coordinates the authors working on it (if there are more than one). The DL is also responsible for organizing the review process and for inviting voluntary reviewers, if any.
Author(s)	Usually the author of the deliverable is the Deliverable Leader but there may be more than one authors writing each document. The authors cooperate with the Task Leader and Work Package Leader to collect all needed information for preparing the deliverable. The authors are being supervised by the DL.
Task Leader	The Task Leader is responsible for appointing the Deliverable Leader. The TL and the DL can be the same person.
Work Package Leader	The Work Package Leader has the overall responsibility for the work package task and related deliverables. The WPL is directly communicating with the PC to provide information regarding the evolution of the document production.
Reviewers	Appointed or voluntary reviewers are responsible for evaluating the deliverable and for proposing changes/corrections before forwarding the deliverable to the PC for a formal approval.
Project Coordinator	The Project Coordinator approves the deliverable and submits it to the EC.

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5.3.1 Review Process

The submission of a deliverable is a process with several intermediate stages that must be completed before it reaches the submission phase. TwinERGY identifies the following four phases in the deliverable production process:

Phase 1: During this phase, the author(s) prepare the first version of the deliverable.
Phase 2: After the author(s) write the deliverable, they internally review the document so that it can achieve the status of "draft".
Phase 3: The draft deliverable is being peer-reviewed by two members of the consortium, other than the author(s), so that it can achieve the status of "proposal".
Phase 4: After considering the comments and the proposed changes made by the reviewers, the PC verifies the deliverable quality so that it can achieve the status of "accepted".
Phase 5: Once the deliverable is accepted, it can be finally submitted to EC by the PC.
In order that the involved parties follow the above 5-step procedure while respecting the submission date, a strict timeline is set including all actions that must be carried out in each phase. More specifically:

- Two months before submission deadline, the WPL should contact the PC and inform him regarding a detected delay or risk of delay in the submission of deliverables. If necessary, the PC will have to communicate such delays to the EC.
- Two months before submission deadline, the DL should notify the assigned reviewers about the deliverable production progress and ask for voluntary reviewer availability.
- One month in advance of the delivery date, the DL should contact both the WPL and the PC to confirm the delivery date and inform them that there is not any unexpected delay to the submission of the document.
- At least three weeks before the submission due date, the DL should submit the draft to the appointed reviewers and make sure that both the WPL and the PC are informed for this evolution.
- Within a week from the draft deliverable receival, the reviewers should provide their comments to the draft in a track change mode and propose improvements. In case the DL does not agree with reviewers' remarks, he should contact the reviewers, propose the rejection of such alterations to the deliverable and ask for their confirmation.
- At least one week before the document delivery date, the DL must implement all the agreed changes proposed by the reviewers. The updated document is sent to the WPL for approval as well as to the PC to inform him about the applied changes.
- At least one week before the submission, the DL finalizes the deliverable proposal and issues the document to the PC for the final approval.

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5.3.2 Reviewers

A minimum of two reviewers is set as TwinERGY requirement per deliverable. In order to nominate reviewers for each deliverable, several criteria are set for an effective appointment. The general criteria for nominating reviewers are presented below:

1. The author(s) of the deliverable cannot be nominated for the position of the reviewer of the deliverable.
2. The Work Package Leader or Task Leaders cannot be appointed as the reviewers of the deliverable that is related to the WP.
3. The number of reviews allocated to each partner should be balanced and reasonable, considering their total effort in the project.

A list of reviewers for all deliverables is provided by the Coordinator in the deliverable *D1.3 Quality Assurance Plan*, which was submitted on M6. This list is formulated in accordance with the previously mentioned criteria and may be updated during the project, considering the needs of TwinERGY implementation.

5.3.3 Deliverable Coding

The deliverable naming follows the general rule for naming TwinERGY files that was mentioned in Section 5.1.4; however it is further specialized for such documents below.

TwinERGY_[WPi]_[Di]_[Versioni.i]_rev[LastName-Organisation]_[Date].[Ext]

where:
[WPi]: WP related to the deliverable,
[Di]: number of deliverable,
[Versioni.i]: two digit identifier aiming to track the deliverable history of changes,
rev[LastName-Organisation]: the last name of the reviewer and his affiliation with consortium institutions.
Moreover, there should be a Table with the history of changes included in every deliverable, which will contain the following information:

Table 47. Proposed deliverable coding

REVISION	DATE	AUTHOR	ORGANISATION	DESCRIPTION
v0.1				1st draft
v0.1_rev[LastName-Organisation]				1st draft after review

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v0.2	2nd draft
...	
v0.n	Draft ready for approval by the PC
v1.0	Draft submitted to EC by the PC
v1.1	2nd version of deliverable requested by EC (if applicable)
v1.n	n-th version of deliverable requested by EC (if applicable)
v2.0	Final version submitted to EC by the PC

5.4 Conflict Resolution

The conflict resolution attempts to solve issues within the consortium and will be carried out in increasing order of authority. It will start at a WP level (management of WP leader), leading then at a project level, within the General Assembly and under the leadership of the Project Coordinator. If necessary, the General Assembly will organize a conflict resolution meeting, within 30 days following a written request transmitted by any of the project partners. If consensus cannot be reached, the matter will be resolved by vote of the partners' representatives (one vote per partner). The CA will formalise the rights, obligations, relationships and procedures within the consortium.

5.5 Change Management

5.5.1 Procedures

Change management is a process of requesting, reviewing, approving, carrying out and controlling changes to a project direction or core deliverables that will affect the project results, whether it is impact, budget or timeframe. At the start of the project, in a Project Management Handbook, the Consortium will agree on a well-defined process for change control; this will describe in detail the responsibilities, tolerances for change at different project levels, and the tools to use, in order to manage the change process. Any TwinERGY participant may raise a Request for Change (RFC). The Project Coordinator will then ensure that this is captured and proactively managed to conclusion. An initial review should be made to examine the need for the change, how it

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could be achieved and what the consequences would be. The most appropriate member of the Consortium will normally perform this review. Based on these conclusions, a recommended course of action will be proposed. The diagram below highlights TwinERGY approach to change control.

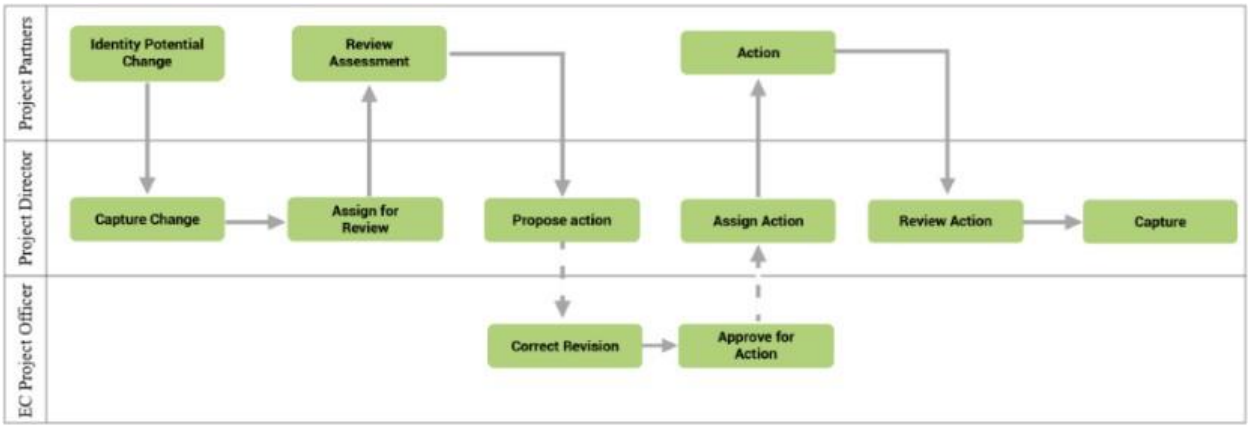

Figure 6. TwinERGY Change Control Process

5.5.2 Amendments

In case of requesting an amendment, the process will follow the rules for amendments that are stated mainly in Article 55 of the GA. Based on the Annotated Model Grant Agreement, an amendment can be requested before the end of the project and it is necessary for any of the following cases:

Changes involving beneficiaries & linked third parties

- Adding a new beneficiary
- Deletion of a beneficiary whose participation has been terminated because:
  - it has not signed the grant agreement
  - it has not provided a declaration on joint & several liability as requested
  - for some other reason
- Change of beneficiary due to 'partial takeover'
- Deletion or addition of linked third party (Article 14)
- Specific case: if a beneficiary participation is terminated at the initiative of other beneficiaries (Article 50.2)

Changes involving the coordinator/principal beneficiary

- Change of coordinator

- Change in the bank account the coordinator uses for payments
- Change in the 'authorisation to administer' option

Changes affecting the project or its implementation

- Change to Annex 1
- Change in the title of the project or its acronym, starting date, duration or reporting periods
- Resumption of project activities after a temporary suspension (Article 49)

Changes involving the financial aspects of the grant

- Change to Annex 2 or 2a
- Change in the maximum grant amount, reimbursement rate(s), the estimated eligible costs of the project (if applicable, for example it is not applicable to lump sum pilot projects), the amount of pre-financing or the contribution to the Guarantee Fund
- Change concerning specific cost categories ('specific unit costs')

An amendment can be requested by the Project Coordinator or can be initiated by the Project Officer (PO). The process for requesting an amendment should follow the steps that are presented below according to the Annotated Model Grant Agreement:

1. The PC launches the amendment request on behalf of the Consortium.

2. The PC prepares the amendment
   The request for an amendment comprises two documents generated automatically:
   i) the letter requesting an amendment: provides justification for the request, using material from the 'justification' field in the 'amendment information' tab. The request is assessed on the basis of whatever information and explanations the coordinator provides.
   ii) the amendment: the legal document containing the amendments to the grant agreement. It is legally binding and will be incorporated into the agreement.

3. The PC submits the amendment to the PO
   Once the draft amendment request is complete (no blocking instances or missing elements remain), it must be submitted to the EU Project Officer for review. In this stage, the officer may provide assistance in preparing the

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amendment. The outcome of this step may be that the officer validates the draft amendment request. Then, the task will go back to the beneficiaries confirming that the request is ready. The assigned Project Legal Signatory (PLSIGN) will be able to sign and formally submit it.

4. The PLSIGN signs & submits the request for an amendment

5. The European Commission assesses the request
   The Commission must accept or reject the request within 45 days and notifies the Project Coordinator formally of its decision through the Funding & Tenders Portal.

5.6 Risk Management

A significant instrument in effective project management is the capability to identify potential risks relating to project implementation and develop respective mitigation measures, which assure that the project objectives will eventually be fully achieved. For that reason, the risk management plan was delivered in a detailed way in M6, as part of the Quality Assurance section of the *D1.1 Project Management Handbook*. This plan is expected to clearly define how the TwinERGY consortium will manage risks throughout the project life-cycle. Moreover, it includes the development of a mitigation plan describing the preventive actions to be performed, responsibilities to be assigned, and tentative dates by which the plan will be implemented.

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6. Project Monitoring and Reporting

Along the lifetime of TwinERGY project, there will be the need for delivering reports towards the EC (as specified in the GA), as well as for delivering reports to the PC for efficient project management purposes. The diagram In Figure 7 presents the project reporting plan of the project. This plan includes the delivery of five internal reports to the PC in addition to two periodic and a final report to EC.

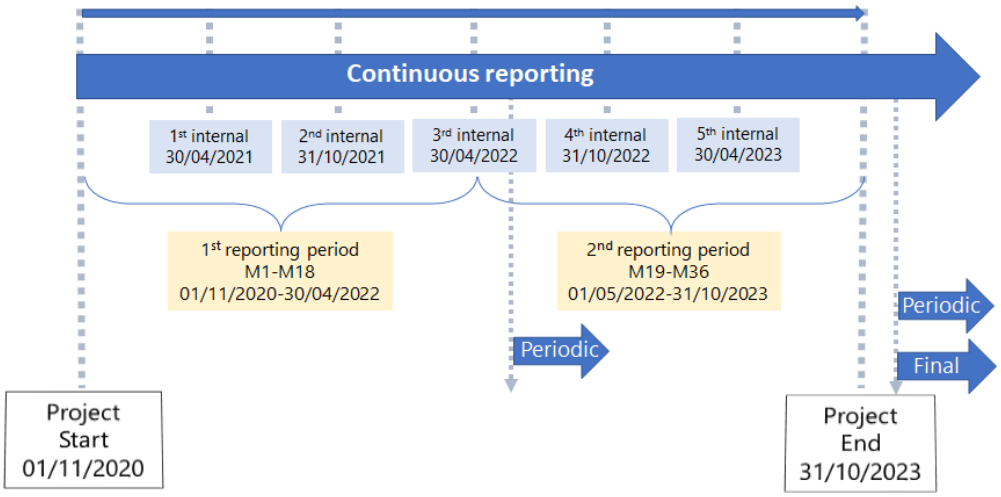

Figure 7. TwinERGY reporting overview

6.1 Internal Reporting

Internal reporting aims to assure an efficient project management and will be performed on a 6-month basis. Regular progress reporting, both at technical and financial level, helps the PC to monitor the TwinERGY progress, achievements and obstacles encountered, while enabling proper management of potential risks and deviations. The report submission by the beneficiaries to the PC is planned as follows:

- 1st internal report: 30/04/2021,
- 2nd internal report: 31/10/2021,
- 3rd internal report: 30/04/2022,
- 4th internal report: 31/10/2022,
- 5th internal report: 30/04/2023.

The internal reporting template will be provided by the PC and will require from beneficiaries the provision of information regarding their participation in project activities and advancement as well as the related resource usage in the respective 6-month period. To cover more efficiently the different aspects of the project monitoring demands, the template is comprised of two parts, dedicated to the technical performance and financial data respectively (see Annexes 1 & 2 of D1.6). These excel spreadsheets will have to be filled in separately for each WP in which the beneficiary

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participates and at each reporting period. The WPL is responsible for soliciting the contribution of Task Leaders, collecting the necessary data and filling out the internal report forms.

6.2 External Reporting

Reporting towards the EC is a contractual obligation of the consortium and can affect project continuity. External reporting comprises of a continuous reporting module, the periodic reporting and the final report at the end of the project.

6.2.1 Continuous Reporting

Continuous reporting functionality in the Funding & Tenders Portal is activated at the time that the project starts and is continuously open for the beneficiaries to submit information about the project progress including:

- Deliverables.
- Progress in achieving milestones.
- Updates to the publishable summary.
- Response to critical risks, publications, communications activities, IPRs.
- Answers to the Horizon 2020 questionnaire about the economic and social impact of the project.

6.2.2 Periodic Reporting

TwinERGY project is divided into two reporting periods, as specified in the GA:

- The first reporting period is from 01/11/2020 (M1) until 30/04/2022 (M18) and its respective report must be submitted to the EC by the 30/06/2022.
- The second reporting period is from 01/05/2022 (M19) until 31/10/2023 (M36) and its respective report must be submitted to the EC by the 31/12/2023.

As specified in the GA, the periodic reporting must include the following:

- a 'periodic technical report' containing:
  - an explanation of the work carried out by the beneficiaries;
  - an overview of the progress towards the objectives of the action, including milestones and deliverables identified in Annex 1-DoA. This report must include explanations justifying the differences between work expected to be carried out and actually carried out. The report must detail the exploitation and dissemination of the results and - if required in Annex 1-DoA - an updated plan for the exploitation and dissemination of the results. The report must also indicate the communication activities;
  - a summary for publication by the Agency;
  - the answers to the 'questionnaire', covering issues related to the action implementation and the economic and societal impact, notably in the context

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of the Horizon 2020 key performance indicators and the Horizon 2020 monitoring requirements.

- a 'periodic financial report' containing:
  - an 'individual financial statement' from each beneficiary and from each linked third party for the reporting period concerned. Amounts which are not declared in the individual financial statement will not be taken into account by the Agency. If an individual financial statement is not submitted for a reporting period, it may be included in the periodic financial report for the next reporting period;
  - an explanation of the use of resources and the information on subcontracting (Article 13) and in-kind contributions provided by third parties (Articles 11 and 12) from each beneficiary and from each linked third party, for the reporting period concerned;
  - a 'periodic summary financial statement', created automatically by the electronic exchange system, consolidating the individual financial statements for the reporting period concerned and including - except for the last reporting period - the request for interim payment.

The periodic reports must be submitted to the EC by the PC within 60 days following the end of each reporting period. The Coordinator must review and explicitly approve the periodic reports. If needed, the PC can send back a financial statement to a partner for further changes, to correct errors and inconsistencies or propose improvements for the technical part of the report. Consequently, all beneficiaries will have to send to PC the draft version of their reports at least 4 weeks before the submission due date.

6.2.3 Final Report

For the final reporting period, in addition to the submission of the periodic report of the last reporting period, a final report is generated automatically by the IT tool. The final report consists of two parts - both of which must be completed in the grant management system -and includes (as specified in the GA):

- a 'final technical report' with a summary for publication containing:
  - an overview of the results and their exploitation and dissemination,
  - the conclusions of the action,
  - the socio-economic impact of the action,

- a 'final financial report' containing:
  - a 'final summary financial statement', created automatically by the electronic exchange system, consolidating the individual financial statements for all reporting periods and including the request for payment of the balance,
  - a 'certificate on the financial statements' for each beneficiary and for each linked third party, if it requests a total contribution of 325,000€ or more, as

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reimbursement of actual costs and unit costs calculated on the basis of its usual cost accounting practices (Article 5.2 and Article 6.2).

The final report must be submitted to the EC by the PC within 60 days following the end of the project, meaning by 31/12/2023. All necessary information must be provided to the PC by the beneficiaries at least 4 weeks before the submission due date.

6.3 Payments

According to the Article 21 of the GA, the EC will make the following payments to the Coordinator:

- one pre-financing payment,
- one or more interim payments, on the basis of the request(s) for interim payment (see Article 20),
- one payment of the balance, on the basis of the request for payment of the balance (see Article 20).

6.3.1 Pre-financing Payment

The pre-financing payment is made at the beginning of the action in order to provide beneficiaries with cash to start working in the project and continue until the first payment. In accordance with Article 21 of the GA, the amount of the pre-financing payment that will be received by the PC is the 80% of the maximum financial EC contribution (4,722,779.51 €). From pre-financing payment, an amount of 295,173.72 €, corresponding to 5% of the maximum grant amount (Article 5.1) is retained by the Agency and transferred into the 'Guarantee Fund'.

6.3.2 Interim Payments

Interim payments reimburse the eligible costs incurred by the beneficiaries for the implementation of the action during the corresponding reporting periods. The total amount of pre-financing and interim payments must not exceed 90% of the maximum grant amount set out in Article 5.1 The Agency will pay to the Project Coordinator the amount due as interim payment within 90 days from receiving the periodic report (see Article 20.3), except if Articles 47 or 48 of the GA apply. The interim payment is calculated as follows:

{90% of the maximum grant amount - {pre-financing and previous interim payments}}

6.3.3 Payment of the Balance

The payment of the balance reimburses the remaining part of the eligible costs incurred by the beneficiaries for the implementation of the action. If the total amount of earlier payments is greater than the final grant amount (see Article 5.3), the payment of the balance takes the form of a recovery (see Article 44). If the total amount of earlier

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payments is lower than the final grant amount, the Agency will pay the balance within 90 days from receiving the final report (see Article 20.4), except if Articles 47 or 48 apply. The payment of the balance also includes the release of the Guarantee Fund (GF). The amount due as for the balance payment is calculated by the Agency by deducting the total amount of pre-financing and interim payments already made (if any) from the final grant amount determined in accordance with Article 5.3:

{final grant amount - {pre-financing and interim payments (if any) made}}

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ANNEXES

ANNEX 1 - INTERNAL REPORT TEMPLATE (PART A - TECHNICAL REPORT)

Name of the organization	
Project acronym	TwinERGY
Reporting period	

WORK PACKAGES							
	Work Package Leader	Scheduled Start Date	Actual Start Date	Scheduled Start Date	Actual End Date	Dependency with other WPs	Progress to date status/deviations report
WP1	Y/N						
WP2	Y/N						
WP3	Y/N						
WP4	Y/N						
WP5	Y/N						
WP6	Y/N						
WP7	Y/N						
WP8	Y/N						
WP9	Y/N						
WP10	Y/N						
WP11	Y/N						
WP12	Y/N						
WP13	Y/N						

TASKS								
	Leading Task	Scheduled Start Date	Actual Start Date	Scheduled Start Date	Actual End Date	Supporting partners	Task status	Progress to date status/deviations report
Task Number and Title:							1. Task completed 2. Task not started 3. Task ongoing-on time 4. Task ongoing-delayed 5. Task disrupted / stopped	

DELIVERABLES								
Deliverable No.	Deliverable Name	Linked WP	Type	Dissemination Level	Scheduled Delivery Date	Actual Delivery Date	If deliverable not submitted on time: justify the deviation	Status
			R, DEM, DEC, OTHER	PU, CO,CI				1.Not submitted 2.Request for revision 3.Not assessed yet 4.Not valid 5.Accepted

MILESTONES								
Milestones No.	Milestones Title	Related WP(s)	Scheduled Delivery Date	Actual Delivery Date	Means of Verification	Achieved	If not achieved Forecast achievement date	If milestone not delivered on time: justify the deviation
						Y/N		

FORESEEN RISKS			
Risk Number	Description of Risk	WP(s) Concerned	Mitigation Measures
[insert risk number as in Annex 1]			

UNFORESEEN RISKS			
Risk Number	Description of Risk	WP(s) Concerned	Mitigation Measures

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ANNEX 2 - INTERNAL REPORT TEMPLATE (PART B - FINANCIAL REPORT)

Name of the organization	
Project acronym	TwinERGY
Reporting period	
Reimbursement rate	
Overhead claimed	

	WP's	**Actual Amount**
Personnel costs		- €
Other direct costs	Travel	- €
	Equipment	- €
	Other goods&services	- €
		- €

TOTAL PERIOD DIRECT COSTS	- €
INDIRECT COSTS	- €
SUBCONTRACTING COSTS	
TOTAL RP1 COSTS	- €
REQUESTED EU CONTRIBUTION	- €

Name of the organization													0
Person Months													
WP1	**WP2**	**WP3**	**WP4**	**WP5**	**WP6**	**WP7**	**WP8**	**WP9**	**WP10**	**WP11**	**WP12**	**WP13**	**Total**

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ANNEX 3 - GENERAL ASSEMBLY MEMBERS

General Assembly Members						
Project partner	Principal Representative			Deputy Representative		
	Name	Position	Email	Name	Position	Email
UoP	Dr. Stylianos Karatzas	Project Manager	stylianos.karatzas@outlook.com	Dr. Ioannis Gialelis	Collaborating Academic Faculty	gialelis@ece.upatras.gr
STAM SRL	Mr. Marco Barbagelata	Business Area Manager	m.barbagelata@stamtech.com	Mr. Luigi Sechi	Project Engineer	l.sechi@stamtech.com
TH OWL	Prof. Johannes Üpping	Professor	johannes.uepping@th-owl.de	Dr. Lukasz Wisniewski	Group leader	lukasz.wisniewski@th-owl.de
UNL	Prof. Tiago Oliveira	Associate Dean	toliveira@novaims.unl.pt	Dr. Ricardo Martins	Manager	rmartins@novaims.unl.pt
IES R&D	Dr. Niall Byrne	Senior Project Manager	niall.byrne@iesve.com	Mr. David Sweeney	Senior Research Consultant	david.sweeney@iesve.com
BENETUTTI	Mr. Rosolino Sini	Energy Manager	aec@comune.benetutti.ss.it	Mr. Marco Barbagelata	Consultant to the Energy Manager	m.barbagelata@stamtech.com
UNIVBRIS	Dr. Theo Tryfonas	Professor	theo.tryfonas@bristol.ac.uk	Dr. Patrick Tully	Research Project Manager	Patrick.Tully@bristol.ac.uk
KWMC	Dr. Lorraine Hudson	Living Lab Director	lorraine.hudson@kwmc.org.uk	Ms. Zoe Banks Gross	Sustainable Neighbourhoods Manager	zoe@kwmc.org.uk
SUITE5	Mr. Giorgos Papadopoulos	Project Manager	giorgos@suite5.eu	Mr. Tasos Tsitsanis	Business Development Director	tasos@suite5.eu
ETRA	Mr. Moisés Antón García	Project Manager	manton.etraid@grupoetra.com	Mr. Álvaro Nofuentes Prieto	Project Manager	anofuentes.etraid@grupoetra.com
WEC P.L.C.	Mr. Ivan Sulev	Director of European Operations	ivan.sulev@gmail.com	Mr. Brad Kayton	CFO	brad@zomepower.com
MYTILINEOS	Mr. Alexandros Vavouris	Civil Engineer	alexandros.vavouris@mytilineos.gr	Dr. Sofia Karakatsani	Product Regulatory Compliance Manager	sofia.karakatsani@protergia.gr
BCC	Mr. Matthew Jones	Project Manager	matt.jones@bristol.gov.uk	Ms. Sarah Lee	Senior Project Officer	Sarah.Lee2@bristol.gov.uk
ED LUXEMBOURG	Dr. George Boultadakis	Senior Research Consultant	george.boultadakis@eurodyn.com	Dr. Anna Malamou	Research Consultant	anna.malamou@eurodyn.com
Stadt Steinheim	Mr. Alexander Rauer	Climate Protection Manager	a.rauer@steinheim.de	Mr. Eberhad Fischer	Geographer	e.fischer@steinheim.de
IFC	Prof. Javier Creus	Founder and CEO	javicreus@ideasforchange.com	Dr. Valeria Righi	Senior Researcher	valeriarighi@ideasforchange.com
ARTHUR'S LEGAL	Mr. Arthur van der Wees	Director and Founder	vanderwees@arthurslegal.com	Ms. Dimitra Stefanatou	Senior Legal Counsel	stefanatou@arthurslegal.com
smartEN	Mr. Andres Pinto-Bello Gomez	Senior Policy Analyst	andres.pintobello@smarten.eu	Ms. Frauke Thies	Executive Director	frauke.thies@smarten.eu

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ANNEX 4 - EXECUTIVE BOARD MEMBERS

Executive Board Members						
Project partner	1st Representative			2nd Representative		
	Name	Position	Email	Name	Position	Email
UoP	Dr. Ioannis Gialelis	Collaborating Academic Faculty	gialelis@ece.upatras.gr	Dr. Stylianos Karatzas	Project Manager	stylianos.karatzas@outlook.com
TH OWL	Prof. Johannes Üpping	Professor	johannes.uepping@th-owl.de	Dr. Lukasz Wisniewski	Group leader	lukasz.wisniewski@th-owl.de
IES R&D	Dr. Niall Byrne	Senior Project Manager	niall.byrne@iesve.com	Mr. David Sweeney	Senior Research Consultant	david.sweeney@iesve.com
UNIVBRIS	Dr. Theo Tryfonas	Professor	theo.tryfonas@bristol.ac.uk	Dr. Patrick Tully	Research Project Manager	Patrick.Tully@bristol.ac.uk
SUITE5	Mr. Giorgos Papadopoulos	Project Manager	giorgos@suite5.eu	Mr. Tasos Tsitsanis	Business Development	tasos@suite5.eu
ETRA	Mr. Moisés Antón García	Project Manager	manton.etraid@grupoetra.com	Mr. Álvaro Nofuentes Prieto	Project Manager	anofuentes.etraid@grupoetra.com
WEC P.L.C.	Mr. Ivan Sulev	Director of European	ivan.sulev@gmail.com	Dr. Alex Papalexopoulos	CEO	alexp@zomepower.com
ED LUXEMBOURG	Dr. George Boultadakis	Senior Research Consultant	george.boultadakis@eurodyn.com	Dr. Anna Malamou	Research Consultant	anna.malamou@eurodyn.com
ARTHUR'S LEGAL	Mr. Arthur van der Wees	Director and Founder	vanderwees@arthurslegal.com	Mrs. Dimitra Stefanatou	Senior Legal Counsel	stefanatou@arthursleglal.com

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ANNEX 5 - EXTERNAL EXPERT ADVISORY BOARD MEMBERS

No.	Name	Organisation	Position	Country	LinkedIn Account
1	Dr. Ajith Parlikad	Cambridge University Engineering Department	Reader in Asset Management	UK	https://uk.linkedin.com/in/ajithparlikad
2	Prof. David Jeong	Texas A&M University	The James C. Smith CIAC Endowed Professor & Associate Research Engineer, Texas A&M Transportation Institute (TTI)	USA	https://www.linkedin.com/in/david-jeong-941a8814
3	Dr. Petros Ganos	Municipality of Patras	Director of the Department of Planning and Studies	GR	https://gr.linkedin.com/in/petros-ganos-39093522
4	Mr. Peeren Rene	Technical University Dublin	Senior Research Fellow	IR	https://www.linkedin.com/in/rene-peeren-3430941b/
5	Dr. Matthews Brian	Science & Technology Facilities Council	Data Science & Technology & DAFNI Group Lead	UK	https://uk.linkedin.com/in/brian-matthews-b642224
6	Dr. Vassilis Nikolopoulos	Energy Unit (Protergia) of MYTILINEOS	Head of Applied Research & Development	GR	https://www.linkedin.com/in/royhamans/
7	Dr. Roy Hamans	V For Venture	CEO	NL	https://www.linkedin.com/in/royhamans/

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ANNEX 6 - PILOT LEADERS

	Pilot Leading Partner Representative		
Pilot Case	**Partner**	**Name**	**Email**
GREECE	**MYTILINEOS**	Mr. Alexander Vavouris	alexandros.vavouris@mytilineos.gr
GERMANY	**TH OWL**	Mr. Fynn Christian Bollhöfer	fynn.bollhoefer@th-owl.de
	Stadt Steinheim	Mr. Alexander Rauer	a.rauer@steinheim.de
ITALY	**BENETUTTI**	Mr. Rosolino Sini	aec@comune.benetutti.ss.it
	STAM SRL	Mr. Luigi Sechi	l.sechi@stamtech.com
UK	**BCC**	Mr. Matthew Jones	matt.jones@bristol.gov.uk
	UNIVBRIS	Mr. Sam Gunner	sam.gunner@bristol.ac.uk

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ANNEX 7 - WORK PACKAGE LEADERS

Work Package	Partner	WP Leader	Email
WP1 - Project Management and Quality Assurance	UoP	Dr. Stylianos Karatzas	stylianos.karatzas@outlook.com
WP2 - Stakeholder Requirements, Obstacles to innovation and Business Models	WEC P.L.C.	Mr. Ivan Sulev	ivan.sulev@gmail.com
WP3 - Cooperation with projects supported under LC-SC3-ES-5-2018-2020 and other selected projects	ED LUXEMBOURG	Dr. Anna Malamou	anna.malamou@eurodyn.com
WP4 - Methodological framework and Architecture Design	TH OWL	Dr. Lukasz Wisniewski	lukasz.wisniewski@th-owl.de
WP5 - Data Collection and Communication Platform	SUITE5	Mr. Giorgos Papadopoulos	giorgos@suite5.eu
WP6 - Development of Digital Twin Platform & System dynamics	IES R&D	Dr. Niall Byrne	niall.byrne@iesve.com
WP7 - Development of TwinERGY system Modules	UoP	Dr. Ioannis Gialelis	gialelis@ece.upatras.gr
WP8 - TwinERGY system integration	ETRA	Mr. Moisés Anton Garcia	manton.etraid@grupoetra.com
WP9 - Pilots	UoP	Dr. Stylianos Karatzas	stylianos.karatzas@outlook.com
WP10 - Exploitation and Business Plans	UNIVBRIS	Mr. Daniel Schien	daniel.schien@bristol.ac.uk
WP11 - Dissemination and Communication	UoP	Prof. Athanasios Chassiakos	a.chassiakos@upatras.gr
WP12 - Ethics, Legislation and standardization	ARTHUR'S LEGAL	Mr. Arthur van der Wees	vanderwees@arthurslegal.com
WP13 - Ethics requirements	UoP	Prof. Athanasios Chassiakos	a.chassiakos@upatras.gr

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ANNEX 8 - TASK LEADERS

	Workpackage	Partner	Task Leader	Email
WP1	T1.1 Project management and Quality assurance	UoP	Dr. Stylianos Karatzas	stylianos.karatzas@outlook.com
	T1.2 European Commission Reporting	UoP	Dr. Stylianos Karatzas	stylianos.karatzas@outlook.com
	T1.3 Administrative and Financial Report	UoP	Dr. Stylianos Karatzas	stylianos.karatzas@outlook.com
	T1.4 Consortium Meetings	UoP	Dr. Stylianos Karatzas	stylianos.karatzas@outlook.com
	T1.5 Knowledge Management & IPR	UoP	Dr. Stylianos Karatzas	stylianos.karatzas@outlook.com
WP2	T2.1 Citizen Engagement and Co-design: framework and guidance	KWMC	Ms. Zoe Banks Gross	zoe@kwmc.org.uk
	T2.2 Stakeholders Requirements	UNL	Dr. Diego Costa Pinto	dpinto@novaims.unl.pt
	T2.3 Business models analysis	WEC P.L.C.	Mr. Ivan Sulev	ivan.sulev@gmail.com
	T2.4 Analysis of social, ethical and cultural barriers to innovation	SmartEN	Mr. Andres Pinto-Bello Gomez	andres.pintobello@smarten.eu
	T2.5 Technical barriers analysis	ED LUXEMBOURG	Dr. Anna Malamou	anna.malamou@eurodyn.com
WP3	T3.1 Utilization of other projects' results funded under complementary topics and similar projects through the BRIDGE initiative	ED LUXEMBOURG	Dr. Anna Malamou	anna.malamou@eurodyn.com
	T3.2 Cooperation with projects supported under LC-SC3-ES-5-2018-2020	ED LUXEMBOURG	Dr. Anna Malamou	anna.malamou@eurodyn.com
WP4	T4.1 Consumers' behavioural analysis	UNL	Prof. Tiago Oliveira	toliveira@novaims.unl.pt
	T4.2 Consumer engagement strategies assessment and development	UNL	Ms. Catarina Neves	cneves@novaims.unl.pt
	T4.3 Methodological Framework, Design and development	UNIBRIS	Dr. Theo Tryfonas	theo.tryfonas@bristol.ac.uk
	T4.4 System's architecture design	ETRA	Mr. Moisés Antón	manton.etraid@grupoetra.com
WP5	T5.1 Open Standards Review and Common Information Model Adaptation	SUITE5	Mr. Giorgos	giorgos@suite5.eu
	T5.2 Data Management Platform Backbone Infrastructure	SUITE5	Mr. Giorgos	giorgos@suite5.eu
	T5.3 Core Data Ingestion, Curation and Management Services	SUITE5	Mr. Giorgos	giorgos@suite5.eu
	T5.4 Data security, encryption and privacy mechanisms	SUITE5	Mr. Giorgos	giorgos@suite5.eu
WP6	T6.1 System Dynamics and Asset interdependencies	UNIBRIS	Dr. Patrick Tully	patrick.tully@bristol.ac.uk
	T6.2 Demand flexibility models design and development	IES R&D	Dr. Niall Byrne	niall.byrne@iesve.com
	T6.3 Consumer digital twin design and development	UoP	Dr. Ioannis Gialelis	gialelis@ece.upatras.gr
	T6.4 Digital twin interconnected platform design and development	IES R&D	Dr. Niall Byrne	niall.byrne@iesve.com
WP7	T7.1 Modules' specifications and system interoperability	ETRA	Mr. Moisés Antón	manton.etraid@grupoetra.com
	T7.2 Consumer Comfort / Well-being Module	UoP	Dr. Ioannis Gialelis	gialelis@ece.upatras.gr
	T7.3 Consumer and Neighbourhood demand flexibility profiling Module	IES R&D	Dr. Niall Byrne	niall.byrne@iesve.com
	T7.4 Home & Tertiary real-time Energy Monitoring Module	STAM SRL	Mr. Luigi Sechi	l.sechi@stamtech.com
	T7.5 DER management Module	TH OWL	Prof. Johannes Üpping	johannes.uepping@th-owl.de
	T7.6 TwinEV Module	ETRA	Mr. Moisés Antón	manton.etraid@grupoetra.com
	T7.7 Transactive Energy Module	WEC P.L.C.	Mr. Ivan Sulev	ivan.sulev@gmail.com
	T7.8 Social Network Module	ED LUXEMBOURG	Dr. Anna Malamou	anna.malamou@eurodyn.com
	T7.9 Risk Management and event handling Module	STAM SRL	Mr. Luigi Sechi	l.sechi@stamtech.com
WP8	T8.1 TwinERGY integration with field devices and distributed smart grid assets	ETRA	Mr. Moisés Antón García	manton.etraid@grupoetra.com
	T8.2 TwinERGY system modules integration and lab-testing	ETRA	Mr. Moisés Antón García	manton.etraid@grupoetra.com
	T8.3 TwinERGY system final version	ETRA	Mr. Moisés Antón García	manton.etraid@grupoetra.com
WP9	T9.1. Pilot Specifications and Quality assurance	UNIBRIS	Mr. Ulas Baloglu	ulas.baloglu@bristol.ac.uk
	T9.2. Pilot Management Plan development	UoP	Dr. Stylianos Karatzas	stylianos.karatzas@outlook.com
	T9.3 Pilot demonstrations Implementation	UoP	Dr. Stylianos Karatzas	stylianos.karatzas@outlook.com
	T9.4 Pilot Validation, Impact Realisation & Recommendations	UoP	Dr. Stylianos Karatzas	stylianos.karatzas@outlook.com
	T9.5 Continuous documentation of pilots' activities	IFC	Dr. Valeria Righi	valeriarighi@ideasforchange.com
WP10	T10.1 Business plans development	WEC P.L.C.	Mr. Ivan Sulev	ivan.sulev@gmail.com
	T10.2 Business opportunity validation	UNIVBRIS	Mr. Daniel Schien	daniel.schien@bristol.ac.uk
WP11	T11.1 Visual identity, website and social media	IFC	Ms. Ana Ramirez	anaramirez@ideasforchange.com
	T11.2. Management of Strategic Communication and Dissemination Activities	UoP	Dr. Stylianos Karatzas	stylianos.karatzas@outlook.com
	T11.3. Citizen Learning & Dissemination	KWMC	Dr. Lorraine Hudson	lorraine.hudson@kwmc.org.uk
	T11.4. Energy Futures Videos	IFC	Ms. Lucia Errandonea	luciaerrandonea@ideasforchange.com
	T11.5 Networking with related research projects and initiatives	SmartEN	Mr. Andres Pinto-Bello Gomez	andres.pintobello@smarten.eu
WP12	T12.1 Identification of Legal & Ethics Requirements	ARTHUR'S LEGAL	Mr. Arthur van der	vanderwees@arthurslegal.com
	T12.2 Legal & Ethical Compliance monitoring	ARTHUR'S LEGAL	Mr. Arthur van der	vanderwees@arthurslegal.com
	T12.3 Regulatory Recommendations and Standardization	SmartEN	Mr. Andres Pinto-Bello Gomez	andres.pintobello@smarten.eu
	T12.4 Data use licenses	KWMC	Dr. Lorraine Hudson	lorraine.hudson@kwmc.org.uk
WP13	D13.1 : H - Requirement No. 1	UoP	Prof. Athanasios Chassiakos	a.chassiakos@upatras.gr
	D13.2 : POPD - Requirement No. 2	UoP	Prof. Athanasios Chassiakos	a.chassiakos@upatras.gr

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ANNEX 9 – KICK-OFF MEETING AGENDA

1st Day, 25th November 2020

10:15 – 10:30	**Welcome and kick-off meeting objectives** *Dr. Stylianos Karatzas, TwinERGY Project Manager, Civil Engineering Dept., University of Patras* *Associate Prof. Athanasios Chassiakos, TwinERGY Project Coordinator, Civil Engineering Dept., University of Patras*
10:30 – 10:45	**Project introduction** *Dr. Stylianos Karatzas, TwinERGY Project Manager, Civil Engineering Department, University of Patras*
10:45 – 12:15	**Presentation of the consortium: entities and roles in the project (Part A)**
10:45 – 10:55	UoP – Civil Engineering Department *Associate Prof. Athanasios Chassiakos, TwinERGY Project Coordinator, Civil Engineering Dept., University of Patras*
10:55 – 11:05	UoP – Electrical and Computer Engineering Dept. Applied Electronics Lab *Dr. John Gialelis, Electrical and Computer Engineering Dept., University of Patras*
11:05 – 11:15	STAM SRL *Mr. Marco Barbagelata, Senior Project Manager, ICT Engineering Department, STAM SRL*
11:15 – 11:25	Technische Hochschule Ostwestfalen-Lippe *Prof. Johannes Üpping, Electrical engineering, Institute Future Energy, TH OWL* *Dr. Lukasz Wisniewski, Institute Industrial IT, TH OWL*
11:25 – 11:35	Universidade Nova De Lisboa *Associate Dean Tiago Oliveira, NOVA Information Management School*
11:35 – 11:45	IES R&D *Dr. Niall Byrne, Senior Project Manager R&D-IES Ltd*
11:45 – 11:55	Benetutti *Mr. Rosolino Sini, Municipality of Benetutti* *Mr. Marco Barbagelata, Senior Project Manager, ICT Engineering Department, STAM SRL*
11:55 – 12:05	University of Bristol & Bristol's City Council *Associate Prof. Theo Tryfonas, Civil Engineering Department, University of Bristol* *Mr. Matthew Jones, Project Manager, Bristol City Council*
12:05 – 12:15	Knowle West Media Centre LBG *Dr. Lorraine Hudson, Living Lab Manager, Knowle West Media Centre*
12:15 – 12:30	**Break**
12:30 – 14:00	**Presentation of the consortium: entities and roles in the project (Part B)**
12:30 – 12:40	Suite 5 Data Intelligence Solutions Limited *Mr. Anastasios Tsitsanis, Business Development Director, Suite 5 Data Intelligence Solutions Limited*
12:40 – 12:50	ETRA Investigation Y Desarrollo SA *Mr. Álvaro Nofuentes Prieto, Project Manager, Department of Technology-ETRA I+D*
12:50 – 13:00	World Energy Consortium P.L.C. *Mr. Ivan Sulev, Director of EU Operations at WEC*
13:00 – 13:10	Mytilinaios Anonimi Etaireia

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	Mr. Alexandros Vavouris, Civil Engineer, Mytilinaios Anonimi Etaireia
13:10 – 13:20	European Dynamics Luxembourg SA
	Dr. George Boultadakis, Senior Research Consultant at European Dynamics
13:20 – 13:30	Stadt Steinheim
	Mr. Alexander Rauer, Climate protection & Demography, Stadt Steinheim
	Prof. Johannes Üpping, Electrical engineering, Institute Future Energy, TH OWL
13:30 – 13:40	IDEAS For Change
	Dr. Valeria Righi, Senior Researcher at Ideas for Change
13:40 – 13:50	Arthur's Legal
	Mr. Arthur van der Wees, Managing Director & Founder Arthur's Legal, Strategies & Systems
13:50 – 14:00	Smart Energy Europe
	Mr. Andres-Pinto Bello, Senior Policy Analyst at Smart Energy Europe
14:00 – 15:00	**Break**
15:00 – 15:15	**Associate Prof. Ajith Parlikad,** *Head of Asset Management Group, University of Cambridge*
15:15 – 16:15	**Presentation of the consortium bodies and management structure**
	Ms. Ioanna Kasa, Civil Engineer, University of Patras
16:15 – 16:45	**Open discussion**
16:45 – 17:00	**Closing of the Day 1 meeting**

2nd Day, 26th November 2020

10:00 – 10:10	**Welcome and agenda of Day 2**
10:10 – 10:40	**Presentation from Project Officer**
	Ms. Michaela Gigli, Project Officer, Innovation and Networks Executive Agency
10:40 – 12:10	**Presentation of work packages: Objectives, Timing & Development Plan - Work Session 1**
10:40 – 10:55	WP1: Project Management and Quality Assurance
	Ms. Garyfallia Liappi, Civil Engineer, University of Patras
10:55 – 11:10	WP2: Stakeholder Requirements, Obstacles to Innovation and Business Models
	Mr. Ivan Sulev, Director of EU Operations at WEC
11:10 – 11:25	WP3: Cooperation with projects supported under LC-SC3-ES-5-2018-2020 and other selected projects
	Dr. Anna Malamou, Research Consultant at European Dynamics
11:25 – 11:40	WP10: Exploitation and Business Plans
	Associate Prof. Theo Tryfonas, Civil Engineering Department, University of Bristol
11:40 – 11:55	WP11: Dissemination and Communication
	Ms. Vasiliki Lazari, Civil Engineer, Ph.D. candidate, University of Patras
11:55 – 12:10	WP12: Ethics, Legislation and standardization
	Ms. Dimitra Stefanatou, Senior Legal Counsel at Arthur's Legal
12:10 – 12:25	**Break**
12:25 – 13:55	**Presentation of work packages: Objectives, Timing & Development Plan - Work Session 2**
12:25 – 12:40	WP4: Methodological framework and Architecture Design
	Prof. Johannes Üpping, Electrical engineering, Institute Future Energy, TH OWL

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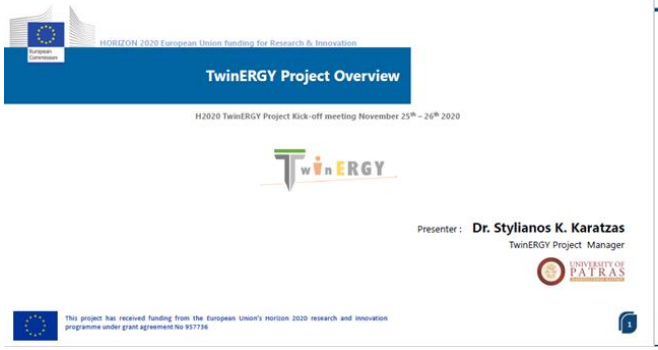
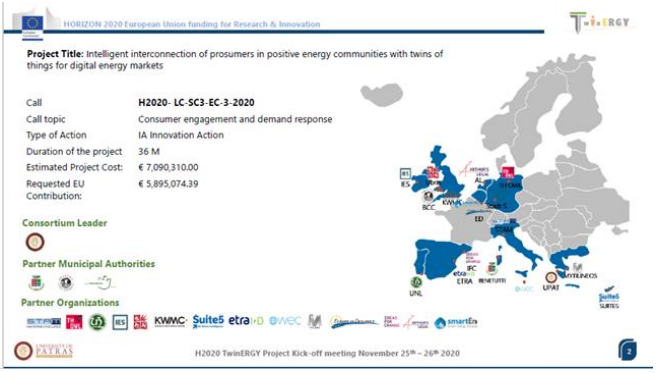
	Dr. Lukasz Wisniewski, Institute Industrial IT,TH OWL
12:40 – 12:55	WP5: Data Collection and Communication Platform
	Mr. Georgios Papadopoulos, Project Manager at Suite5 Data Intelligence Solutions
12:55 – 13:10	WP6: Development of Digital Twin Platform & System dynamics
	Dr. Niall Byrne, Senior Project Manager R&D-IES Ltd
13:10 – 13:25	WP7: Development of TwinERGY system Modules
	Dr. John Gialelis, Electrical and Computer Engineering Dept., University of Patras
13:25 – 13:40	WP8: TwinERGY system integration
	Mr. Moisés Antón García, Project Manager at ETRA I+D
13:40 – 13:55	WP9: Pilots
	Mr. Anastasios Karameros, Civil Engineer, Ph.D. candidate, University of Patras
13:55 – 14:55	**Break**
14:55 – 16:00	**Administrative and financial aspects of the project**
	Ms. Vasiliki Lazari, Civil Engineer, Ph.D. candidate, University of Patras
16:00 – 17:15	**Open discussion**
16:00 – 16:30	Co-creation session for designing the Energy Future Videos
	Mr. Javier Creus, Founder of Ideas for Change
	Dr. Valeria Righi, Senior Researcher at Ideas for Change
	Ms. Ana Ramirez, Communications manager at Ideas for Change
	Ms. Anna Higueras, Project Manager at Ideas for Change
	Giovanni Maccani, Senior Researcher at Ideas for Change
16:30 – 17:00	Pilot sites-Economies of scale
	Mr. Matthew Jones, Project Manager, Bristol City Council
17:00 – 17:15	Endowed Professor David Jeong, Construction Science, Texas A&M University
17:15 – 17:30	Other topics
17:30 – 17:45	**Wrap-up and overview of upcoming tasks & action plans**
	Dr. Stylianos Karatzas, TwinERGY Project Manager, Civil Engineering Dept., University of Patras
17:45 – 18:00	**End of kick-off meeting**

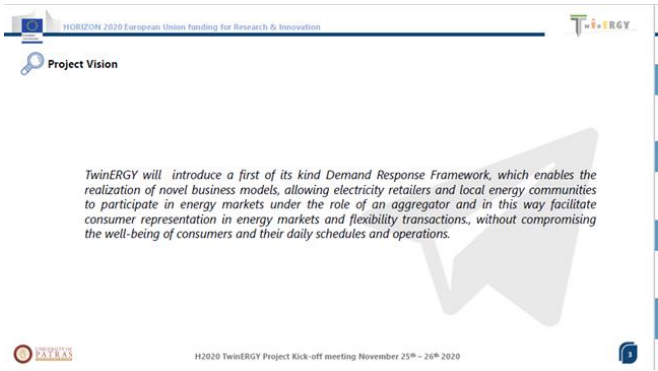
Twinergy has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 957736

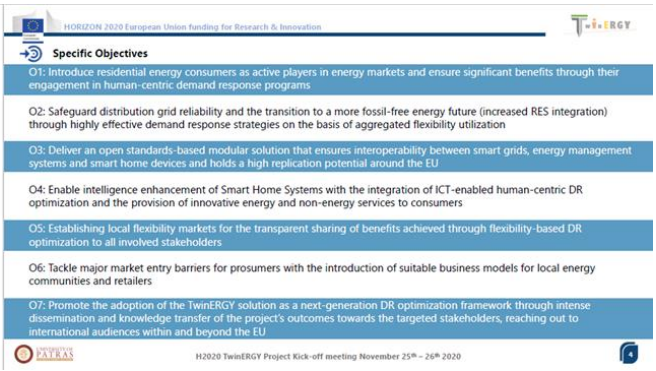
ANNEX 10 – KICK-OFF MEETING PRESENTATIONS

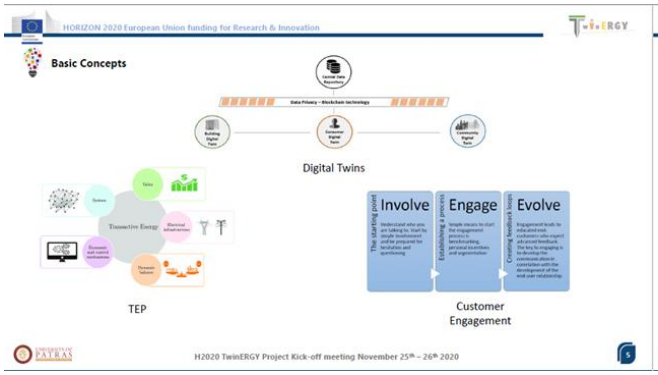
TwinERGY project overview

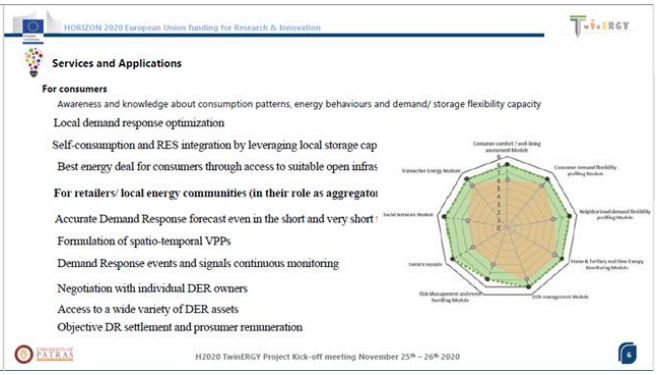


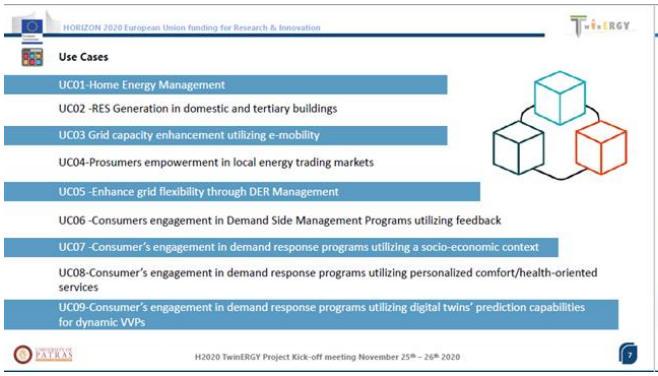


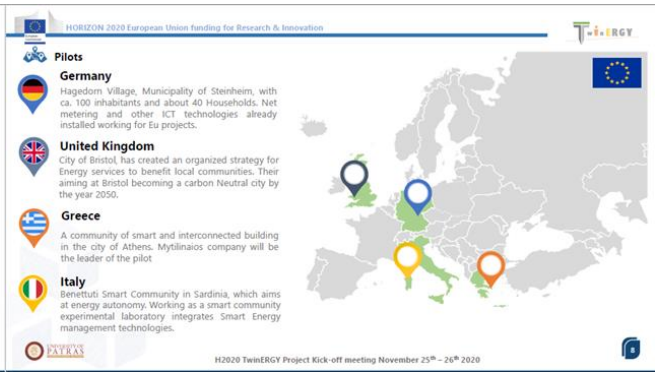


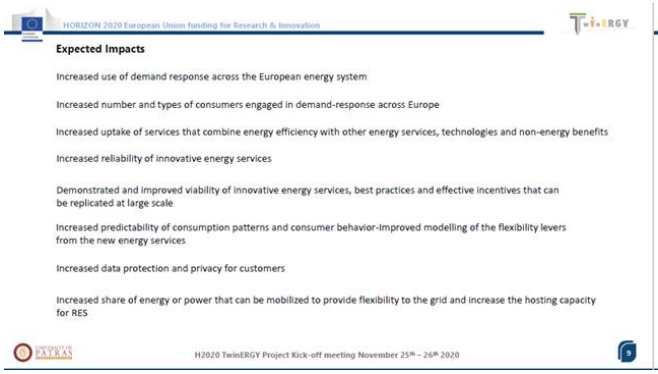




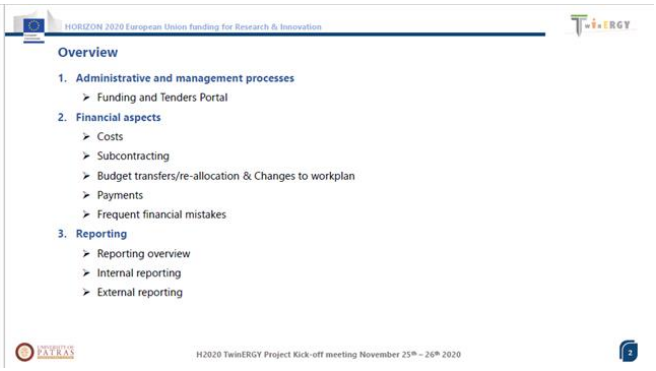


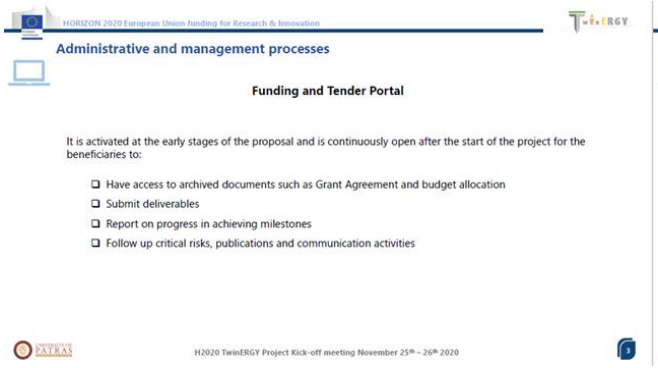


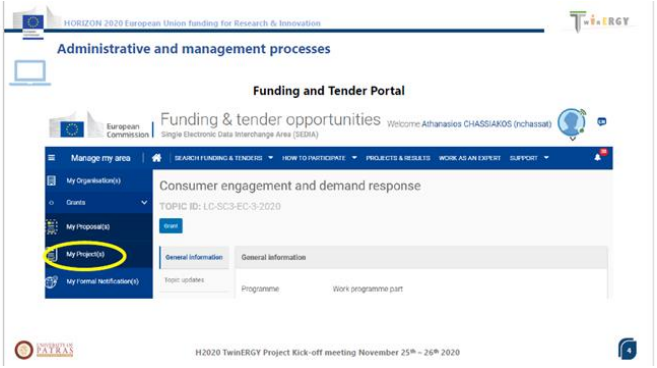


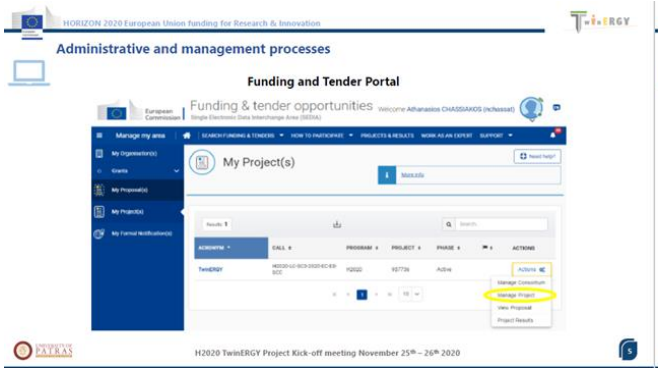


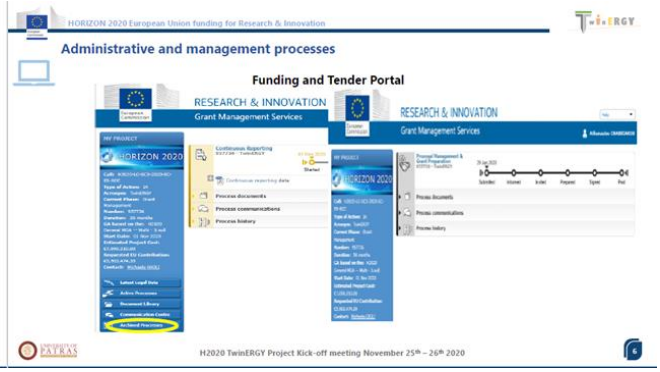
Administrative and financial aspects of the project







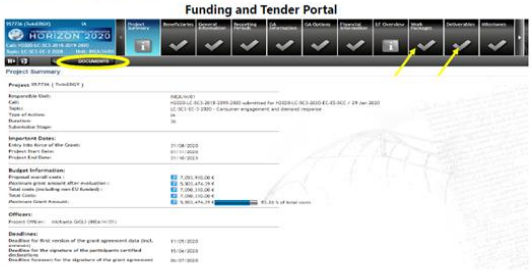




HORIZON 2020 European Union funding for Research & Innovation

Administrative and management processes

Funding and Tender Portal



HORIZON 2020 European Union funding for Research & Innovation

Financial aspects

Costs

Eligible (actual) costs

- Actually incurred by the beneficiary
- Incurred during the action and connected to the action
- They must be indicated in the estimated budget set out in Annex 2
- Identifiable and verifiable
- In compliance with national law
- Reasonable, financial sound

Ineligible costs

- Bank charges
- Currency exchange losses
- Debt and debt service charges
- Excessive or reckless expenditure
- Provisions for future losses or debts
- Interest owed
- Costs incurred during the suspension of the implementation of the action
- Costs reimbursed in respect of any other EU project

HORIZON 2020 European Union funding for Research & Innovation

Financial aspects

Costs

Indirect Costs → 25% * Direct Costs – subcontracting

- Expenditures for travels that are not directly related to the project but took place during the project
- Fees for secretarial support
- PCs and laptops
- Stationery, toners, office supplies etc.

HORIZON 2020 European Union funding for Research & Innovation

Financial aspects

Costs

Other direct costs

- Depreciation costs of equipment , infrastructure or other assets
- Travel costs
- Other goods and services

Tips:

- Identified in the Description of Action (DoA)
- Be economical - best value for money
- Be necessary for the project
- To be directly related to the project-specific WP(s)
- Be within the duration of the project

- Include travels of staff/researchers that are part of the project's team
- Must be related to the project and assigned to a relevant WP
- Cannot be charged personal/entertainment expenses
- Keep agenda of meetings, programme of conferences, etc

HORIZON 2020 European Union funding for Research & Innovation

Financial aspects

Subcontracting

- Identified in the Description of Action (DoA)
- Subcontracting between partners is prohibited
- No direct supervision of the beneficiary
- The assignment should be based on the most economical solution or the best value for money

Tips:

- As a procedure, it is suggested to ask at least 3 quotes to demonstrate the best value for money and transparency
- If the need arises for additional subcontracts (not foreseen in the DoA) → the coordinator contacts the PO for approval → amendment needed

HORIZON 2020 European Union funding for Research & Innovation

Financial aspects

Budget transfers/re-allocation & Changes to workplan

- Underspent budget can be transferred to another category (internally to the beneficiary) along the project duration
- Underspent budget can be transferred to another beneficiary (by the end of the Project)
- **An amendment is required for:**
  1. Modification of tasks
  2. Budget transfers from actual to unit costs
  3. Budget transfers to categories with zero initial budget
  4. New subcontracts

HORIZON 2020 European Union funding for Research & Innovation

Financial aspects

Payments

Pre-financing payment:

- 80% of the Maximoum Grant Amount
- The EC keeps 5% retention (Guarantee fund)

Interim payments:

- The Agency will pay the coordinator within 90 days from receiving the periodic report
- The interim payment will be calculated as follows:

  (90% of the maximum grant amount) – (pre-financing payment)
- Ineligible costs will be rejected and not taken into account for the payment

Final payment - Payment of the balance:

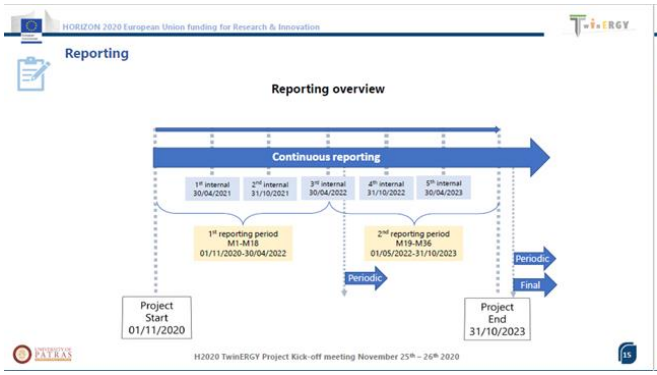
- Reimburses the remaining part of the eligible cost incurred
- If total amount of earlier payments > final grant amount (Article 5.3) → recovery
- If total amount of earlier payments < final grant amount → paid within 90 days from receiving the final report
- Includes the release of the Guarantee Fund (GF)

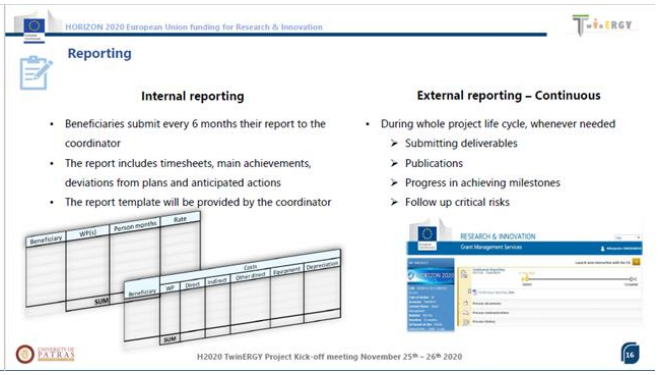
HORIZON 2020 European Union funding for Research & Innovation

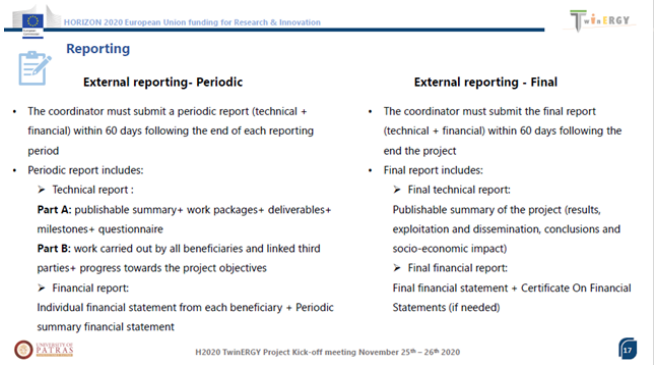
Financial aspects

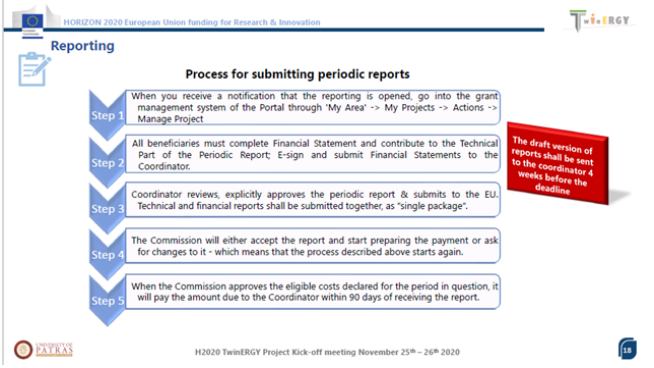
Frequent financial mistakes

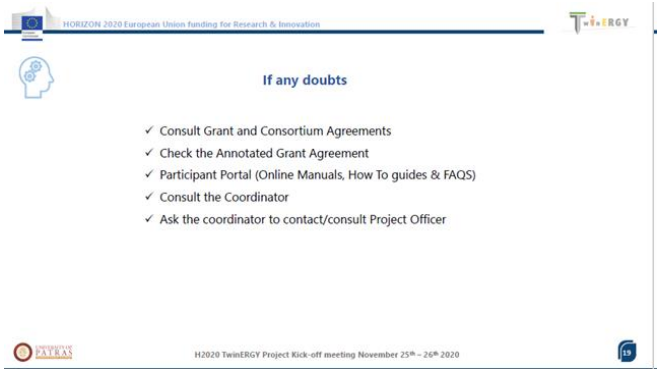
- ❑ Amounts claimed in the financial statement **do not reconcile** with the amounts encoded in the accounting system and /or with real costs incurred
- ❑ Costs were incurred **outside the eligibility period**
- ❑ Durable equipment is **not depreciated**
- ❑ Purchase costs are **not reasonable** or with **no link to the project**
- ❑ Lack of **supporting documents** to substantiate costs incurred











WP1-Project Management and Quality Assurance

WP1 - Objectives

- **Ensure all outputs are delivered on time and on budget**
- **Quality criteria are met, and any risks or issues are mitigated**
- **Sound documentation and internal communication systems**

Lead Beneficiary: UoP

Partners involved: STAM SRL, TH OWL, UNL, IES R&D, BENETUTTI, UNIBRIS, KWMC, SUITE5, ETRA, WEC P.L.C., MYTILINEOS, BCC, ED LUXEMBOURG, Stadt Steinheim, IFC, ARTHUR'S LEGAL, smartEn

WP1 Overview – Task work allocation

WP1 Project Management and Quality Assurance	UoP	STAM SLR	TH OWL	UNL	IES R&D	BENE TUTTI	UNIV BRIS	KW MC	SUITE 5	ETRA	WEC P.L.C	MYTIL INEOS	BCC	ED LUXE MBU RG	Stadt Steinh eim	IFC	ARTHU R'S LEGAL	Smart En
T1.1 Project Management and Quality Assurance	✓		●				●											
T1.2 European Commission Reporting	✓													●			●	●
T1.3 Administrative and Financial Report	✓						●											
T1.4 Consortium Meetings	✓	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
T1.5 Knowledge Management & IPR	✓								●								●	
Participation per partner (effort)	20.5	2	3	2	1.5	2	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	4	1.5

✓ Task Leader ● Support

Total: 51.5

T1.1 Project Management and Quality Assurance

(November 2020 – October 2023)

1. Elaboration of a project management plan.
2. Creation of the necessary structure for successful project management and monitoring.

- Planning of meetings and key deliverables.
- Rendering of an interactive task management system and a risk management plan.
- Guidelines for financial reporting.
- Quality assurance and procedures.

Task Leader: UoP **Support:** TH OWL, UNIVBRIS

T1.2 European Commission Reporting

(November 2021 – December 2021)
(November 2022 – December 2022)
(November 2023)

1. Successful and in time submission of the reporting obligations of each partner.
2. Handling of all financial and contractual issues with the EC.

- Preparation of detailed annual milestones in line with the project schedule.
- Initiation of any remedial actions required.
- Preparation of the necessary co-ordination meeting with the EC Officers.

Task Leader: UoP **Support:** ED, ALBV, smartEn

T1.3 Administrative and Financial Report

(November 2020 – October 2023)

1. Successful support in administrative issues.

- Gathering information, recording findings or fulfilling obligations demanded by EC.
- Tackling the changes that may be arise during the project execution.
- Implementation of the changes.
- Monitoring the expenses and allocation of the budget.

Task Leader: UoP **Support:** UNIVBRIS

T1.4 Consortium Meetings

(October 2021)
(October 2022)
(October 2023 - November 2023)

1. Ensuring proper information management.
2. Summarize the project outputs, definition of actions and measures to meet the project objectives, progress reporting and review preparations.

- Kick-off meeting
- General Assembly (at least once a year)
- Progress meetings (at least once every 6 months)
- Project Executive Board meetings (held twice a year)
- WP meetings (TBD)
- Pilot meetings (at least once every 3 months)
- Final meeting

Task Leader: UoP **Support:** STAM, TH OWL, UNL, IES, BENETTUTI, UNIVBRIS, KWMC,Suite5, ETRA, WEC, MYTILINEOS, BCC, ED, StadtS., IFC, ALBV, smartEN

T1.5 Knowledge Management & IPR

(November 2020 – October 2023)

1. Development of an internal policy for managing scientific, technical and over value-added information.
2. All relevant results are available to the community free of charge (Open Access).

- Data Management Plan (how data will be handled during the lifespan of the project and after).
- Covering any claims to intellectual property rights.

Task Leader: UoP **Support:** Suite5, ALBV

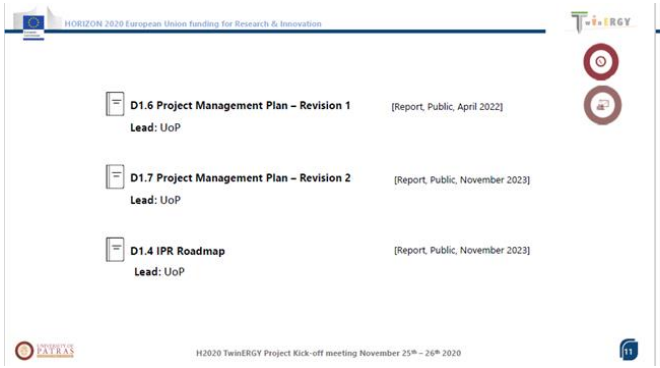
D1.5 Project Management Plan [Report, Public, December 2020]
Lead: UoP

D1.1 Project Management Handbook [Report, Public, April 2021]
Lead: UoP

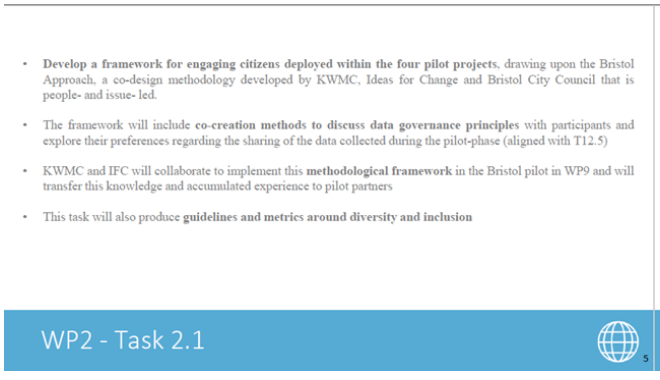
D1.3 Quality Assurance Plan [Report, Public, April 2021]
Lead: UoP

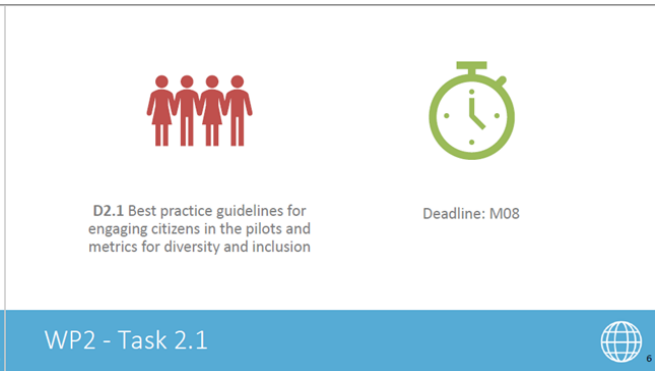
D1.2 Data Management Plan [Open Research Data Pilot, Public, April 2021]
Lead: UoP

Twinergy has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 957736



WP2 Stakeholder Requirements, Obstacles to innovation and Business Models





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WP2 - Task 2.2

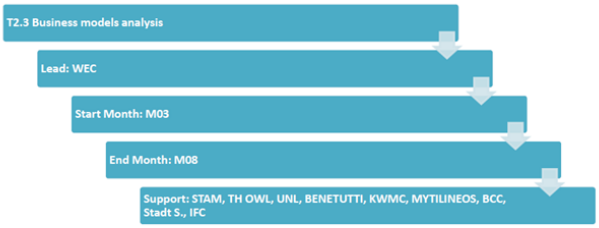
- **Identify the requirements** of stakeholders in diverse environments and **develop a strategy** on how to implement different best practices according to the special characteristics of the areas of interest to **achieve the maximization of consumer's engagement in an energy market** with high penetration of RES, Demand Response programs, energy storage and EVs.
- This task will allow the Use Cases (UCs), **scenarios development** and the methodically decomposition of high-level requirements to uncover underlying risks for in actual implementations
- The **results derived** from this analysis will be the **foundation** upon which the pilot demonstrations will be implemented in WP9
- Meaningful, understandable and quantifiable **Key Performance Indicators (KPIs)** will be established and followed, according to the identified needs of the UCs

WP2 - Task 2.2

D2.2 STAKEHOLDERS ANALYSIS: KPIS, SCENARIOS AND USE CASE DEFINITION

DEADLINE: M06

WP2 - Task 2.2



WP2 - Task 2.3

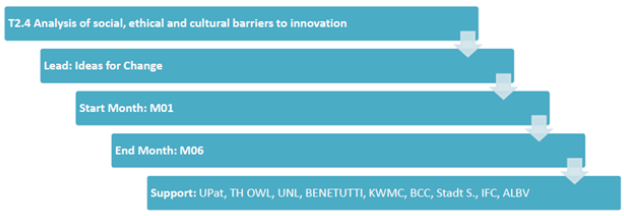
- Review existing **business models** from the energy sector and propose and **develop new ones** which will be demonstrated in real conditions at the demo sites
- Understand the **market potential of the TwinERGY** technologies and explore the results of incentive mechanisms as well as the resulting interactions between the market players
- Identify the major **socio-economic factors** that will determine the adoption of TwinERGY products by providers, as well as, consumers due to the increasing importance of Demand-Response schemes, under the integrated EU energy market architecture
- Examine the potential to **disrupt the utility-centric business model**, apply the **transactive energy principles** to utility distribution systems and business models, and to utility-customer relations – all enabled by the growth of DERs and the IoT revolution

WP2 - Task 2.3

D2.3 BUSINESS MODELS & INCENTIVE SCHEMA DEFINITION

DEADLINE: M08

WP2 - Task 2.3



WP2 - Task 2.4

- Develop a deliverable focused on the observed **barriers for Demand Response** in the different member states; the task will be led by smartEn supported by a number of organizations, with direct input from the smartEn membership, business organizations with first-hand knowledge of the regulatory barriers they experience in different countries, especially where they limit the creation of new products and innovation.
- This document will also focus on the **barriers consumers face** when adopting Demand Response, be it cultural barriers, knowledge or social limitations for energy vulnerable customers
- SmartEn will work together with consumer organizations to gather **customer perspective**
- The outcome will be a **comprehensive analysis of all kinds of barriers** customers and service providers face and how they can affect the implementation of TwinERGY business models
- This task will feed into Task 12.4 to **establish recommendations** to overcome them

WP2 - Task 2.4

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D2.4 - SOCIAL, ETHICAL AND CULTURAL BARRIERS TO INNOVATION

DEADLINE: M09

WP2 - Task 2.4

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T2.5 Technical barriers analysis

Lead: European Dynamics

Start Month: M01

End Month: M06

Support: UPat, STAM, TH OWL, Suite5, ETRA, WEC

WP2 - Task 2.5

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- On the technical side, TwinERGY will focus on comprehensively **landscaping the barriers** hindering the successful penetration of demand response business models and schemes into the energy markets and prioritizing them on the demonstration countries
- The **main technical barriers** that the project will focus on refer to: (1) the very slow roll-out of smart meters and penetration of smart appliances, (2) the low user acceptance of smart appliances and intelligent energy management systems, (3) data security and privacy issues and (4) standardization issues

WP2 - Task 2.5

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D2.5 TECHNICAL OBSTACLES TO INNOVATION ANALYSIS

DEADLINE: M06

WP2 - Task 2.5

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Thank you!

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W: www.worldenergyconsortium.com

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WP3-Cooperation with projects supported under LC-SC3-ES-5-2018-2020 and other selected projects

TwinERGY

"Intelligent interconnection of prosumers in positive energy communities with twins of things for digital energy markets"

WP3 Presentation
Kick-off Meeting, 25-26 November 2020
European Dynamics (ED)

Presenter: Anna Malamou, anna.malamou@eurodyn.com

WP3 in a nutshell

WP3 title: Cooperation with projects supported under LC-SC3-ES-5-2018-2020 and other selected Projects

Lead Beneficiary: ED LUXEMBOURG

Start Month: M1
End Month: M36

Contributors: UoP, STAM SRL, TH OWL, UNL, IES R&D, UNIBRIS, KWMC, SUITE5, ETRA, WEC P.L.C., MYTILINEOS, BCC, IFC, smartEn

Twinergy has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 957736

WP3 objectives

- Establishment of cooperation with projects supported under the H2020 umbrella in order to:
  - make good use of the experience gained during their implementation phase
  - utilize tools and technologies they developed
  - further analyze and reclaim their results
- Establishment of cooperation with projects supported under LC-SC3-ES-5-2018-2020* topic and take advantage of the results reported

* TSO – DSO – Consumer: Large-scale demonstrations of innovative grid services through demand response, storage and small-scale (RES) generation

WP3 tasks

- Task 3.1: Utilization of other projects' results funded under complementary topics and similar projects through the BRIDGE initiative (M1-M36)
  - TwinERGY will become **part of the BRIDGE initiative** which fosters the value-added collaboration between projects
  - In BRIDGE, the project will:
    - contribute to workshops and events
    - adopt common approaches regarding the presentation of results, news and success stories
    - participate in discussions to align strategies

→ During this task further projects will be identified that have common or complementary objectives and additional collaboration activities will be organised

BRIDGE Working Groups

1. **Data Management**
   - Communication Infrastructure
   - Cybersecurity and Data Privacy
   - Data Handling
2. **Regulation**
   - Energy storage
   - Smart grids
3. **Customer Engagement**
   - Customer Segmentation
   - Value systems
   - Customer Engagement
   - Behavioural changes
   - Regulatory Innovation to Empower Consumers
4. **Business Model**
   - Business model description and valuation
   - Existing and new or innovative business models
   - Profitability of different business models

First actions for Task 3.1

1. TWINERGY to be part of the BRIDGE initiative
2. Identify which TWINERGY partners already participate in BRIDGE through other projects
3. Decide in which working groups and/or subgroups TWINERGY will participate
4. Decide which partner is going to represent TWINERGY in each working group (for example ED is very active in the Data Management Working Group)
5. Initiate discussions with experienced partners regarding what is useful for TWINERGY (e.g. align strategic goals with other projects, perform liaise with partners from the other projects, monitor results and see how they deal with issues we are going to face in TWINERGY such as scalability and replicability etc.)

WP3 tasks

- Task 3.2: Cooperation with projects supported under LC-SC3-ES-5-2018-2020 (M1-M36)
  - **INTERRFACE**: Take advantage of the Integrated pan-European Grid Services Architecture (IEGSA) design and findings to overcome known and new challenges
    → ED (coordinator) and MYTILINEOS S.A. (partner) in INTERRFACE
  - **Coordinet**: Establish and support a synergies mechanism in relation to the architecture design, the used protocols and the system integration
    → ETRA is a partner in CoordiNet
  - **ONENET**: Cooperation with goal to define a common IT architecture and interfaces
    → ED and MYTILINEOS S.A. are partners in ONENET

➢ Further synergies will be explored during project implementation

First actions for Task 3.2

1. All partners that participate in INTERRFACE, Coordinet and ONENET to propose ways to cooperate with those projects
2. ED to prepare a working document to retrieve information from other projects to identify common ground that could be useful to TWINERGY (technical work should be in agreement with the SGAM framework)
3. Investigate options to retrieve information and/or create synergies with cross-sectoral projects outside the energy sector that face the same challenges as TWINERGY (e.g. interoperable functionalities on data exchange platforms)

Additional actions to be pursued

A series of joint activities to be organised with other projects as continuous actions:

- ✓ Collaboration meetings
- ✓ Participation in joint sessions in conferences
- ✓ Informal joint project meetings
- ✓ Organisation of joint workshops
- ✓ Liaison activities using a top down approach, based on interaction between Project Coordinators, and a bottom up approach based on communications between project partners
- ✓ Synergies for joint dissemination activities
- ✓ Joint publications

WP3 deliverables

- **D3.1:** TwinERGY – European Projects Innovation and Cooperation roadmap (ED), due: M8, Report, Public
  - This deliverable will provide the plan on how to achieve the establishment of common approaches and participation to common discussion with other BRIDGE running projects to align strategies and activities of common interest
- **D3.2:** TwinERGY – European Projects Innovation and Cooperation report (ED), due: M36, Report, Public
  - This deliverable will report the actions taken and their outcomes, in relation to the adaptation and extension of results of existing projects (such as H2020 INTERRFACE and CoordiNET)

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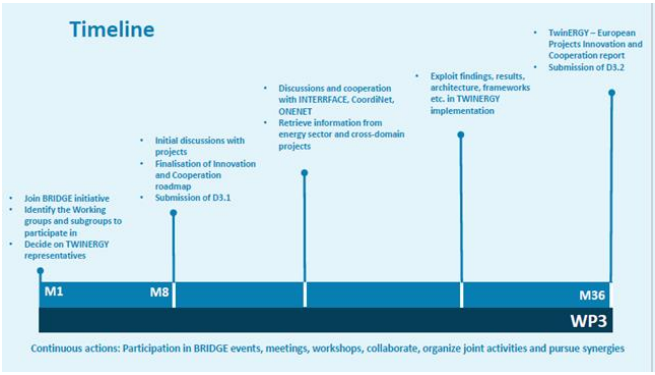
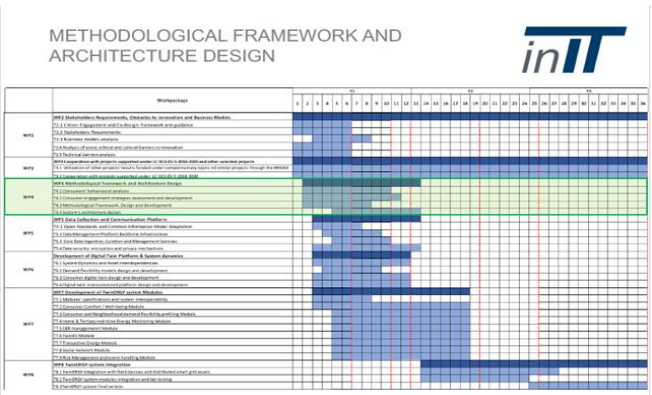


WP4-Methodological framework and Architecture Design



METHODOLOGICAL FRAMEWORK AND ARCHITECTURE DESIGN

- Main objectives:
  - Review previously developed system's architectures in H2020 projects and use as basis
    - e.g. NOBEL GRID, WiseGRID
  - Aggregate results from WP2 & WP3
  - Develop a system architecture to serve as foundation for WP5, WP6, WP7 and pilots & demonstrators in WP8 & WP9
  - Provide architecture mapping on EU SGAM Framework
- Main deliverable:
  - Open, secure, flexible customer-centric system architecture considering all Interoperability Layers and Domains

Fig.1: High level relationship between the work packages

METHODOLOGICAL FRAMEWORK AND ARCHITECTURE DESIGN

- Inputs from WP2 and WP3 will be used to develop and validate the WP4 system architecture based on the stakeholder requirements and proven approaches from collaborating projects
- The development of
  - a common information model (WP5),
  - a data management platform (WP6),
  - consumer-centric system modules (WP7),
  - and subsequent system integration in pilots (WP8/9)

  require a preceding definition and validation of all necessary components on an abstract level
- The work in WP4 will provide the necessary methodological framework, underlying standards, semantic models and ontologies on a functional level to build the rest of the project onto

Fig.1: High level relationship between the work packages

METHODOLOGICAL FRAMEWORK AND ARCHITECTURE DESIGN

- The Smart Grid Architecture Model (SGAM) Framework describes a reference system architecture for smart grids
  - Aggregates and standardizes existing materials and results on that topic
    - Smart Grid Standards: NIST Conceptual Model, GridWise Stack etc.
    - Architecture Standards: Archimate, TOGAF (The Open Group Architecture Framework)
  - Acts as blueprint for development of future smart grid systems and components
  - **TwinERGY needs a system architecture to develop and integrate its systems and models around**
  - The design should be mapped on SGAM to provide standardization compatibility and utilize proven and validated system models

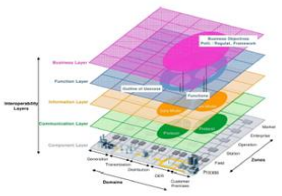


Fig.1: European SGAM Framework

METHODOLOGICAL FRAMEWORK AND ARCHITECTURE DESIGN

- Contents and results from WP2 & WP3 and the SGAM blueprint will be combined to develop the TwinERGY interoperable infrastructure
  - Identification of stakeholder requirements (WP2)
    - Derivation of use cases
    - Development of scenarios
  - Adoption and extension of relevant results and architectures of related H2020 projects (WP3)

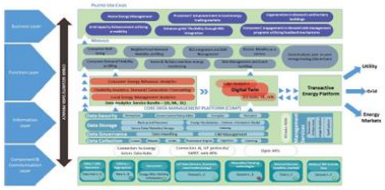


Fig.1: TwinERGY interoperable infrastructure based on the SGAM Framework

METHODOLOGICAL FRAMEWORK AND ARCHITECTURE DESIGN

- Further WP4 objectives:
  - Deep analysis of alternating consumer behavior
  - Usage of IoT to learn about behaviors, attitudes and habits in energy consumption
  - Multi-group analysis of consumers to identify homogenous energy behaviors within individual consumer clusters
  - Utilizing EC recommendations for customer engagement projects
  - Evaluate various business analysis methods for sectorial analysis
  - Combine selected methods with results from pilots/trials and from previous EU projects

METHODOLOGICAL FRAMEWORK AND ARCHITECTURE DESIGN

- Methodology of TwinERGY
  - 4 basic phases
  - Two-way information flow between the lab and research field
  - Demonstration at 4 pilot sites

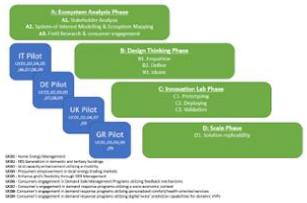


Fig. 1: TwinERGY Methodological Framework

METHODOLOGICAL FRAMEWORK AND ARCHITECTURE DESIGN

- Consumer behavioural analysis and engagement strategies
  - What are the relevant dimensions that influence the consumer changing behaviour and their implications in the consumer engagement process?
  - Identification of consumers homogeneous behaviour/attitudes and clustering
- Engagement of customer in 4 steps
  - Addressing customer values
  - Understanding customer values
  - Early engagement
  - Engagement through participation

> For engagement of residential consumer, don't begin with technology first but with people (…) understand people's problems and think how we can improve their life " InteGrid Project

METHODOLOGICAL FRAMEWORK AND ARCHITECTURE DESIGN

- WP4 deliverables:
  - Open, secure, flexible customer-centric system architecture considering all Interoperability Layers and Domains
  - Conceptual model describing drivers and inhibitors of consumer behavior
  - Validation of the model by means of a bootstrapping procedure
  - Engagement plan describing processes and behavioral change related to the engagement process, based on EC methodology
  - Methodological framework to select appropriate business analysis method for sectorial analysis
    - Including Problem Structuring Models, Group Model Building, Business Model Canvass

THANKS

WP5-Data Collection and Communication Platform

TWINERGY KICK-OFF MEETING

WP5 - DATA COLLECTION AND COMMUNICATION PLATFORM
SUITE5

TwinERGY project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957736

WP5 Objectives and tasks

- Review the underlying energy data, ontologies and semantic vocabularies
- Design theTwinERGY's common information model and define a lifecycle approach to manage its evolution.
- Develope the TwinERGY backbone infrastructure of the Core Data Management Platform (CDMP)
  - deliver the data-at-rest and data-in-motion ingestion, management and curation services
  - develop the end-to-end security, encryption and privacy assurance services in accordance with the requirements elicited for the energy domain.

TwinERGY project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957736

Twinergy has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 957736

WP5 Tasks

Task name	Leader	Timing	Status
T5.1 Open Standards Review and Common Information Model Adaptation	SUITE5	m3-m10	Not started
T5.2 Data Management Platform Backbone Infrastructure	SUITE5	m4-m32	Not started
T5.3 Core Data Ingestion, Curation and Management Services	SUITE5	m5-m28	Not started
T5.4 Data security, encryption and privacy mechanisms	SUITE5	m3-m28	Not started

TwinERGY project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957736

WP5 deliverables

Deliverable name	Leader	Timing	Status
D5.1 TwinERGY Common Information Model	SUITE5	M10	Not started
D5.2 Data Collection, Security, Storage & Management Services Bundles – Beta Release	SUITE5	M14	Not started
D5.3 TwinERGY Integrated Data Management Platform – Alpha, Mockups Release	SUITE5	M14	Not started
D5.4 TwinERGY Integrated Platform– Beta Release	SUITE5	M16	Not started
D5.5 Data Collection, Security, Storage & Management Services Bundles – Release 1.00	SUITE5	M20	Not started
D5.6 TwinERGY Integrated Data Management Platform– Release 1.00	SUITE5	M24	Not started
D5.7 Data Collection, Security, Storage & Management Services Bundles – Release 2.00	SUITE5	M28	Not started
D5.8 TwinERGY Integrated Data Management Platform– Release 2.00	SUITE5	M32	Not started

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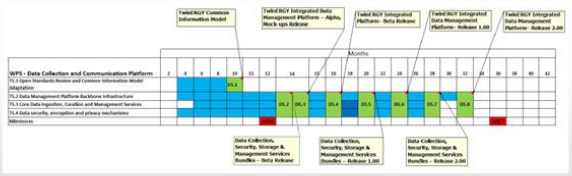
WP5 Gannt



TwinERGY project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957736

TASK 5.1 OPEN STANDARDS REVIEW AND COMMON INFORMATION MODEL ADAPTATION
LEADER: SUITE5

Duration: M3-M10

TwinERGY project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957736

Task 5.1 Overview

- Extensively study the smart grid data modelling landscape and select specific open standards, semantic models and ontologies for further elaboration depending on their relation to the TwinERGY scope.
- Define the TwinERGY common information model based on data structure and semantics of assets available from the TwinERGY demonstrators
- Define the overall TwinERGY Common Information model with emphasis on future extensions, without disrupting the existing model

TwinERGY project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957736

TASK 5.2 DATA MANAGEMENT PLATFORM BACKBONE INFRASTRUCTURE
LEADER: SUITE5

Duration: m4-m32

TwinERGY project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957736

Task 5.2 Overview

- Implement the TwinERGY Data Storage Services Bundles, namely the backbone storage infrastructure for storing the collected data in the Core Data Management Platform
  - Examine and select the storage appropriate for the energy data that TwinERGY handles
  - Design a multi-persistence architecture that builds on traditional SQL, NoSQL and time-series storage engines for performance and productivity gains with distributed, multitenant-capable search engines for indexing purposes.
  - delivery Data Management Services containing the resources orchestrator, the notification services and the usage analytics services for the data providers

TwinERGY project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957736

TASK 5.3 CORE DATA INGESTION, CURATION AND MANAGEMENT SERVICES
LEADER: SUITE5

Duration: M5- M28

TwinERGY project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957736

Task 5.3 Overview

- Define the Big data platform for batch and real-time data ingestion, management and curation
- Utilize methods and tools to develop scalable and modular services to serve multiple data collection-related purposes such as
  - to handle data providers via APIs, through real time data pipelines and/or batch files,
  - to receive real-time updates for data assets
  - to map the data assets' structure to the TwinERGY CIM
  - to track the lineage and the derivation of the data assets
  - to curate the data from the data validation, data cleaning, data completion, data harmonization and data linking perspectives
  - to provide a detailed profiling of the data in accordance with the TwinERGY metadata schema

TwinERGY project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957736

TASK 5.4 DATA SECURITY, ENCRYPTION AND PRIVACY MECHANISMS
LEADER: SUITE5

Duration: M3- M28

TwinERGY project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957736

Task 5.4 Overview

Design and deliver the Data Security Services Bundle in TwinERGY based on the concrete requirements of the energy stakeholders and the features prioritized for the TwinERGY development activities in each iteration.

Different layers for data security and privacy assurance to be delivered indicatively involve:

- end-to-end encryption services for data assets that are ingested and for key sharing to authorized data consumers
- attribute-based access control policies services that formally describe the circumstances under which access requests to data assets should be granted
- multiple data anonymization methods for data providers to achieve the right balance in the "privacy vs utility" trade-off in their real-time and batch data streams.

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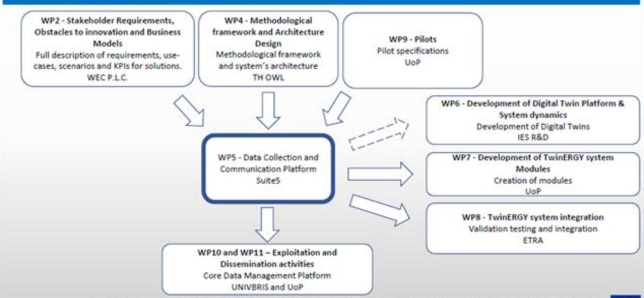
WP5 Interconnections
Links between WP5 and other WPs and deliverables



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WP5: Summary of the action plan for the next 6 months

ACTION [What activities are planned? What do you need from partners involved?]	WHO	WHEN
Until month 6, keep close link with activities of WP2 and WP4 related to requirements, use-cases and methodological framework	S5	-
Organize with WP2 and WP9 the interaction with the pilot stakeholders for the data landscaping → CIM definition	S5	-

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THANK YOU

Questions?

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WP6-Development of Digital Twin Platform & System dynamics

TwinERGY

WP6: Development of Digital Twin Platform & System Dynamics

IES R&D IRELAND

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957736

WP 6 – BY THE NUMBERS

TwinERGY

- 10 Month Duration (M3 – M12)
- 60 Personnel Months
- 7 Consortium Members Involved
- 4 Individual Tasks
- 3 Objectives
- 4 Deliverables

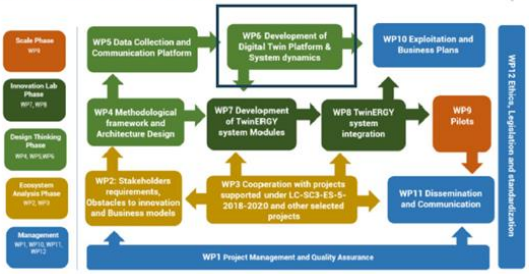
Work package number	6									Lead beneficiary				IES				
Work package title	Development of Digital Twin Platform & System dynamics																	
Participant number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Short name of the participant	UPat	STAM	TH OWL	[illegible]	IES	BENETU	UNIVBRI	KWMC	Suite5	ETRA	WEC	MYTILIN	DOC	ED	Stadt S.	BFC	ALBV	smartEN
PMs per participant	10	7	4	0	19	0	9	0	8	0	3	0	0	0	0	0	0	0
Start month	3							End month		12								

IES R&D IRELAND

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957736

Twinergy has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 957736

WP6 IN THE CONTEXT OF TWINERGY



IES R&D IRELAND

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DIGITAL TWINS

IES R&D IRELAND

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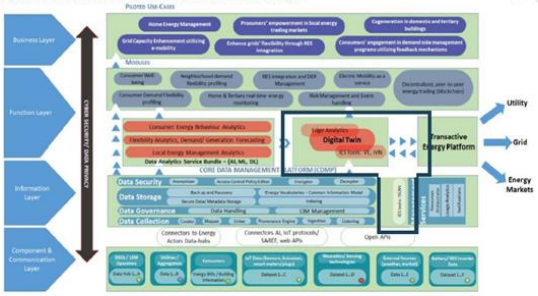
TWINERGY INTEROPERABLE ARCHITECTURE



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WP 6 – KEY OBJECTIVES

1. Development of the Consumer & Community Digital Twin Models
2. Development of the Interlink between the Consumer & Community Digital Twins
3. Connection of the Digital Twins to the Transactive Energy Platform

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WP 6 – TASKS

- T6.1: System Dynamics & Asset Dependencies [M3-M12]
- T6.2: Demand Flexibility Models Design & Development [M4-M9]
- T6.3: Consumer Digital Twin (CDT) Design & Development [M3-M12]
- T6.4: Digital Twin interconnected Platform Design & Development [M3-M12]

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WP 6 – KEY DELIVERABLES

- D6.1: System Dynamics Model [M12]
- D6.2: Demand Flexibility Models [M8]
- D6.3: Consumer Digital Twin [M12]
- D6.4: Digital Twin interconnected Platform [M12]

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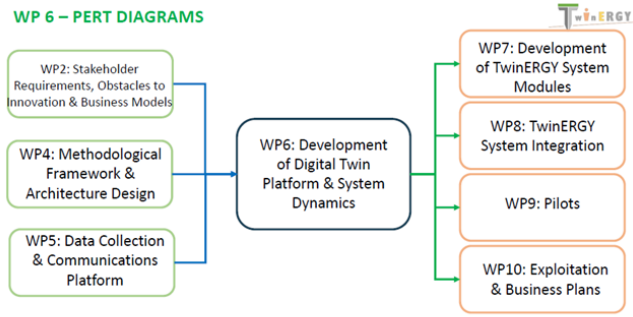
WP 6 – PERT DIAGRAMS



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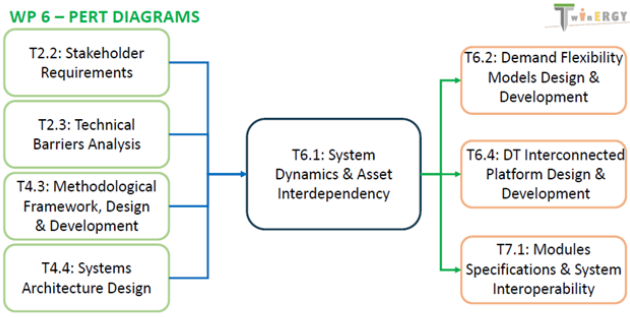
WP 6 – PERT DIAGRAMS



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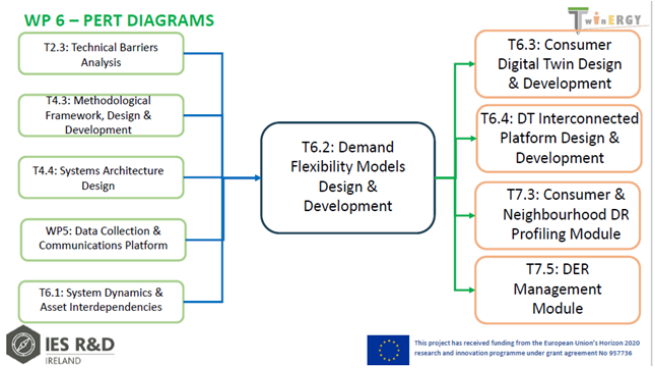
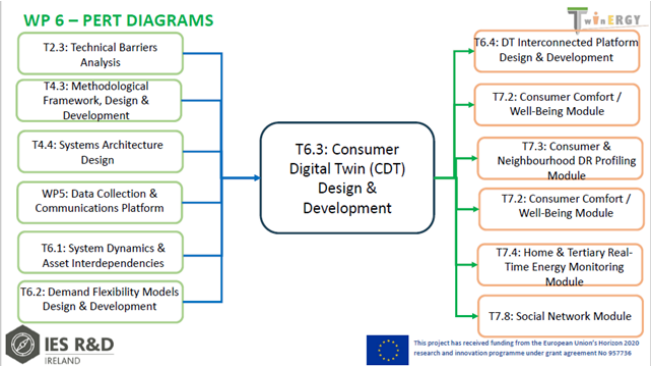
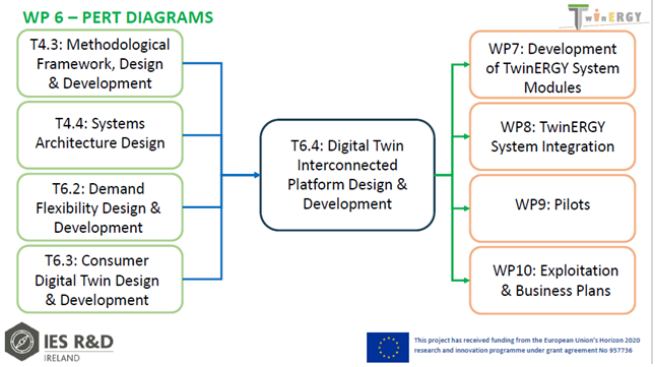
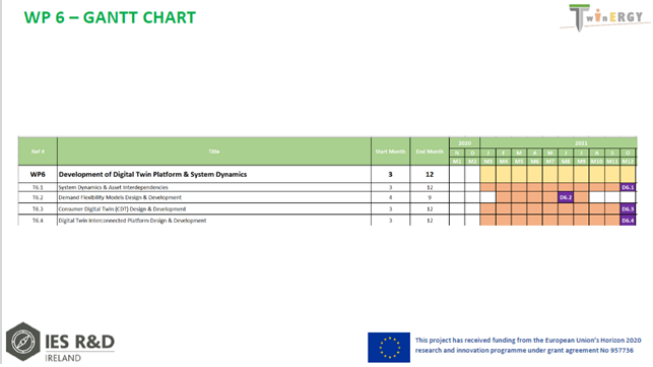
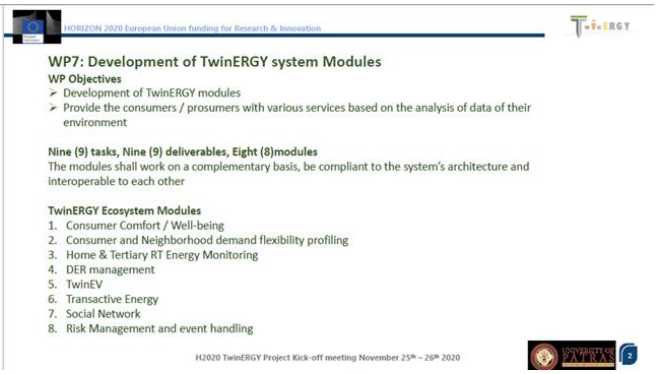








WP7-Development of TwinERGY system Modules



WP7: Development of TwinERGY system Modules

Task 7.1: Modules' specifications and system interoperability (Duration M3-M8)
Lead: ETRA, **Contribution:** UPat, STAM, TH OWL, IES, UNIVBRIS, Suite5, WEC, ED

Objectives
- The goal of this task is the definition of the specifications of the modules and the assurance of the interoperability of the modules regarding:
  - Web services specifications
  - Middleware specifications
  - Data collection from the energy infrastructure and distributed resources and the secure transfer of the information to the modules

Deliverables
D7.1: Modules' Interoperability [R, PU, **M8**]

WP7: Development of TwinERGY system Modules

Task 7.2: Consumer Comfort / Well-being Module (Duration M3-M18)
Lead: UPAT, **Support:** STAM, IES, ETRA

Objectives
- The goal of this task is T7.2 is the is to deploy and scale up the **comfort / well-being module** already developed by UPAT / APEL in previous EU projects, comprising:
  - a user-friendly, low cost, long autonomy wrist wearable wireless device to monitor and acquire physiological signals such as heart rate, oximetry, body temperature, breathing rate, etc) and feed them to the CDT utilizing befitting communications protocols
  - AI modules for further processing of the data
  - A user-friendly app to allow prosumers to further enhance their twinning

Deliverables
D7.2: Consumer well-being module [DEM, PU, **M18**]

WP7: Development of TwinERGY system Modules

Task 7.2: Consumer Comfort / Well-being Module (Duration M3-M18)
Lead: UPAT, **Support:** STAM, IES, ETRA

WP7: Development of TwinERGY system Modules

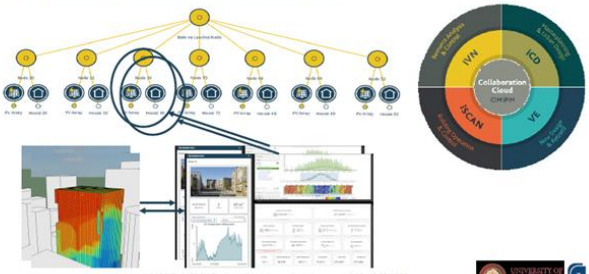
Task 7.3: Consumer and Neighbourhood demand flexibility profiling Module (Duration M5-M18)
Lead: IES, **Support:** UPat, STAM, TH OWL, UNIVBRIS, Suite5, ETRA

Objectives
- The goal of this task is to calculate and depict the potential **demand flexibility profiling** at consumers and communities level (**utilizing the capabilities of consumer and communities Digital Twins**)
  - The flexibility profile will be **physics-driven & data-driven** modelling & **simulation**
  - The appropriate tool will be deployed to calculate the amount of flexibility and its controllability depending on the type

Deliverables
D7.3: Consumer and Neighbourhood demand flexibility profiling Module [OTHER, PU, **M18**]

WP7: Development of TwinERGY system Modules

Task 7.3: Consumer and Neighborhood demand flexibility profiling Module



WP7: Development of TwinERGY system Modules

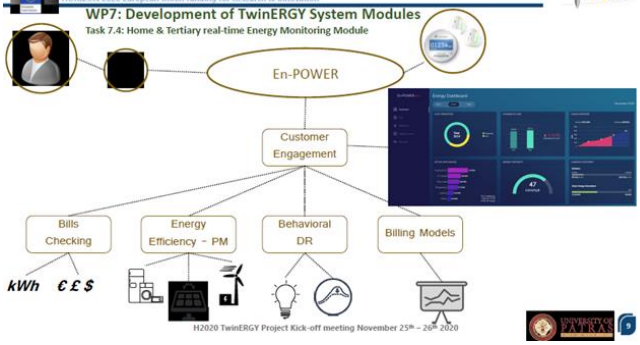
Task 7.4: Home & Tertiary real-time Energy Monitoring Module (Duration M5-M18)
Lead: STAM, **Support:** TH OWL, IES

Objectives
- The goal of this task is to deploy and scale up a user-friendly building Energy Management System (EMS) developed by STAM
  - supports consumers managing self-consumption
  - maximizes self-sustainability
  - increases residential awareness
  - reduces reluctance and fear of participation in Demand Response protocols

Deliverables
D7.4: Home & Tertiary real-time Energy Monitoring Module [OTHER, PU, **M18**]

WP7: Development of TwinERGY System Modules

Task 7.4: Home & Tertiary real-time Energy Monitoring Module



WP7: Development of TwinERGY system Modules

Task 7.5: DER management Module (Duration M5-M18)
Lead: TH OWL, **Support:** STAM, IES

Objectives
- The goal of this task is to develop a Distributed Energy Resources management module to reach optimal energy flow
  - Current grid status is to be calculated and displayed in RT
  - Grid bottlenecks are to be reliably detected and reported
  - Predictions of the expected load and the expected generation are to be integrated
  - When critical network conditions are detected -> utilization of VPP and DR
  - Feedbacks are monitored and if critical situation emerges -> management reacts appropriately working directly with distribution system operators (DSOs) to carry out the corresponding circuits in the power grid

Deliverables
D7.5: RES integration and DER management Module [OTHER, PU, **M18**]

WP7: Development of TwinERGY system Modules

Task 7.6: TwinEV Module (Duration M5-M18)
Lead ETRA, **Support:** UPAT, UNL, UNIVBRIS

Objectives

- The goal of this task is the development of the TwinEV module based on ETRA's product SMAC (Smart Charging Tool) from TRL5 to TRL8 which shall exhibit Smart charging services (Limit load in EV, Cut off power supply to EV, Vehicle to grid (V2G))

- benefits in the EV field:
  - Minimize charging prices for EV drivers
  - Maximize the charging with renewable power (local renewable power support from PV panels, battery storage)
  - Offer stabilization benefits to the DSO

Deliverables
D7.6: Electric Mobility as a Service Module [OTHER, PU, **M18**]

WP7: Development of TwinERGY system Modules

Task 7.7 Transactive Energy Module (Duration M5-M18)
Lead: WEC, **Support:** UPat, Suite5

Objectives

- The goal of this task is the integration of WEC's transactive energy (TE) platform with the TwinERGY framework
  - functional / operational components and APIs of the TE platform shall be designed and implemented
  - DLT/ blockchain technologies such as smart contracts to support the evolving TE system

Deliverables
D7.7: Transactive Energy Module [OTHER, PU, **M18**]

WP7: Development of TwinERGY system Modules

Task 7.8: Social Network Module (Duration M5-M18)
Lead: ED, Support: UPAT, UNL, IES, UNIVBRIS, IFC

Objectives

- The goal of this task is the development of a web-based, energy behavior oriented, social network module based on ED's existing platforms with the following functionalities:
  - **compare energy use** between different neighborhoods and households
  - encourage **DR engagement** and **reduction in energy usage** of consumers
  - **enhance consumers' participation** based on playful challenges and **a social competition/community rewards approach** (TwinERGY Points)
  - facilitate consumers at community level to monitor the **real-life site** (with the aid of **Digital Twin Platform**) and see how much energy is being generated and used
  - allow city residents and service users to act as co-creators and co-producers of public services and be **actively engaged in various stages of the service production process**, from design to delivery

Deliverables
D7.8: Customer Deployment and Social Engagement Module [OTHER, PU, **M18**]

WP7: Development of TwinERGY system Modules

Task 7.8: Social Network Module (Duration M5-M18)

The Social Network Module will be based on ED's existing platforms:

- A market platform (used in H2020 projects L4MS, DIH2 for creating access to manufacturing services) will be **complemented with social nature functions** and will support **Digital Twins feeding data**
- A **gamified mobile application** (used in H2020 projects ChArGED and BENEFFICE for incentivising energy efficient behaviour to employees of public buildings and to residential consumers respectively)

The above engines will be further **updated and adopted** to TwinERGY **requirements** in order to deliver the final version of the Social Network Module

WP7: Development of TwinERGY system Modules

Task 7.9: Risk Management and event handling Module (Duration M5-M18)
Lead: STAM, **Support:** UPAT

Objectives

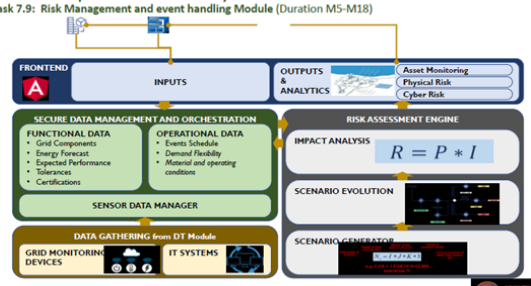
- The goal of this task is the development of a Risk Management and Event Handling Module by integrating **Rampart (STAM) and STPA44 (UPAT) models,** exploiting the potential of energy demand flexibility to address local and global grid situations. The module comprises two main sub-modules:

  - the first one allows performing a secure operation planning and management, evaluating the possible threats and the corresponding impacts associated to a series of unplanned events on the low level of the grid
  - the second sub-module will allow to evaluate a series of preventive actions and countermeasures to mitigate the impacts and minimize the overall risk in a cost-benefit a and consumer-oriented perspective.

Deliverables
D7.9: Risk Management and event handling Module [OTHER, PU, **M18**]

WP7: Development of TwinERGY system Modules

Task 7.9: Risk Management and event handling Module (Duration M5-M18)



WP8-TwinERGY system integration

TwinERGY: Intelligent interconnection of prosumers in positive energy communities with twins of things for digital energy markets

WP8: TwinERGY System Integration

Moisés Antón
Álvaro Nofuentes
[ETRA I+D]

TwinERGY Kick-Off Meeting, 25-26 November 2020

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957736

Overview

- Overview
- WP8 Overview
  - WP8 Overall Information & Main objectives
  - WP8 Timeline
- Description of Tasks
- WP8 Deliverables and Milestones
- WP8 Risk Matrix
- Things to bear in mind
- Question and Answers

WP8 Overall Information & Main objectives

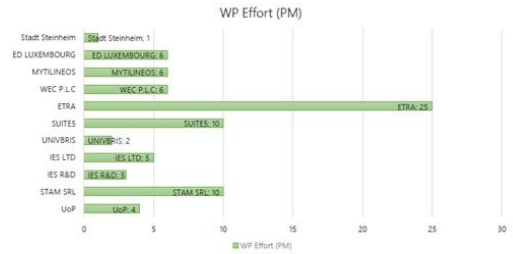
- WP8 objective is to deliver the TwinERGY system through the integration of:
  - Components
  - TwinERGY solution with the Smart Grid components
  - Components in the different Pilot Sites

Duration of the WP from M14 to M36

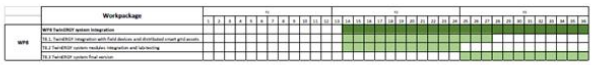
Effort quantified in 78 PM

Participation of 10 partners

WP8 Overall Information & Main objectives



WP8 Timeline



WP8 Description of tasks

Task 8.1 TwinERGY integration with field devices and distributed smart grid assets Leader: ETRA (Duration: M14-M27)

Participants

- *ETRA Investigación y Desarrollo*
- *Panepistimio Patron (UoP)*
- STAM SRL
- IES R&D
- Comune di Benetutti
- University of Bristol
- Suite 5
- MYTILINEOS
- Bristol City Council (BCC)
- European Dynamics Luxembourg SA
- Stadt Steinheim

WP8 Description of tasks

Task 8.1 TwinERGY integration with field devices and distributed smart grid assets Leader: ETRA (Duration: M14-M27)

Objectives

- Integration of TwinERGY solution with the components of the Smart Grid ensuring the connectivity, communication and information exchange.
- Populate the TwinERGY Common Information Model
- Allow real-time and batch data to the TwinERGY Core Data Management Platform through wrappers and APIs

Deliverables

- D8.1 TwinERGY connectors to distributed smart grids assets and respective APIs [DEM, PU, M18]

WP8 Description of tasks

Task 8.2 TwinERGY system modules integration and lab-testing Leader: ETRA (Duration: M14-M24)

Participants

- *ETRA Investigación y Desarrollo*
- *Panepistimio Patron*
- *STAM SRL*
- *IES R&D*
- *University of Bristol*
- *Suite5*
- *World Energy Consortium PLC*
- *European Dynamics Luxembourg*

WP8 Description of tasks

Task 8.2 TwinERGY system modules integration and lab-testing Leader: ETRA (Duration: M14-M24)

Objectives

- Integrate components of TwinERGY solution
- Verification of the requirements and specifications
- Testing activities (Detailed and scalability test) to cover the requirements before validation activities

Deliverables

- D8.2 TwinERGY Pre-trial validation testing scenarios and results [R, PU, M24]

WP8 Description of tasks

Task 8.3 TwinERGY system final version Leader: ETRA (Duration: M25-M36)

Participants

- *ETRA Investigación y Desarrollo*
- *Panepistimio Patron*
- *STAM SRL*
- *IES R&D*
- *University of Bristol*
- *Suite5*
- *World Energy Consortium PLC*
- *European Dynamics Luxembourg*

WP8 Description of tasks

Task 8.3 TwinERGY system final version Leader: ETRA (Duration: M25-M36)

Objectives

- Testing of the solution in real-time conditions (In 4 pilot sites).
- Refinement of the modules and the integration of them.

Deliverables

- D8.3 TwinERGY integrated solution [DEM, PU, M24]

WP8 Deliverables and milestones

Deliverable Number[14]	Deliverable Title	Lead beneficiary	Type[15]	Dissemination level[16]	Due Date (in months)[17]
D8.1	TwinERGY connectors to distributed smart grid assets and respective APIs	10 - ETRA	Demonstrator	Public	18
D8.2	TwinERGY Pre-trial validation testing scenarios and results	10 - ETRA	Report	Public	24
D8.3	TwinERGY integrated solution	10 - ETRA	Demonstrator	Public	24

WP8 Deliverables and milestones

Milestone number[18]	Milestone title	Lead beneficiary	Due Date (in months)	Means of verification
MS4	System's modules integration	10 - ETRA	12	
MS6	Finalization of TwinERGY system	1 - UoP	25	
MS7	Project's completion	1 - UoP	36	

WP8 Risk Matrix

Risk number	Description of risk	WP Number	Proposed risk-mitigation measures
3	The tested prototypes and solutions do not solve the identified problems. Their impact is low.	WP2, WP6, WP7, WP8, WP9	The evolvement of the solution is 1) iterative which means small steps, 2) continuous end-user assessment which means a deep understanding of the value proposition and 3) agile methods which means ability to pivot the direction if needed

Things to bear in mind

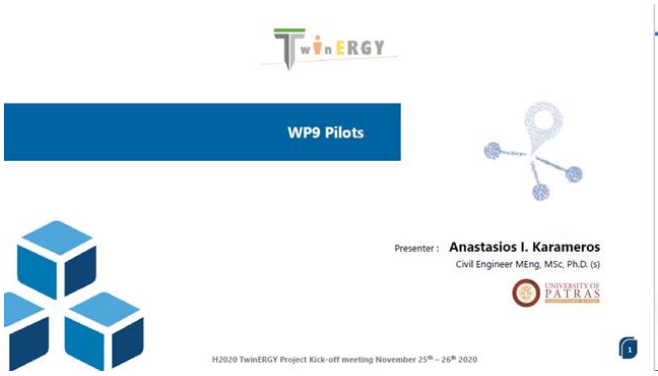
Things to bear in mind regarding the project:

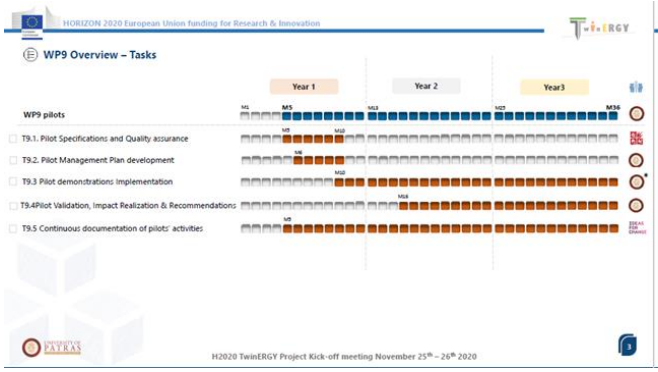
- MS4 (System's module integration) to be changed its Due Date.
- T8.3 (M25-M36) to change its Due Date:
  - Conflict with the D8.3 Due Date (M24).
  - To check if it is necessary to finish it in M36 or earlier.

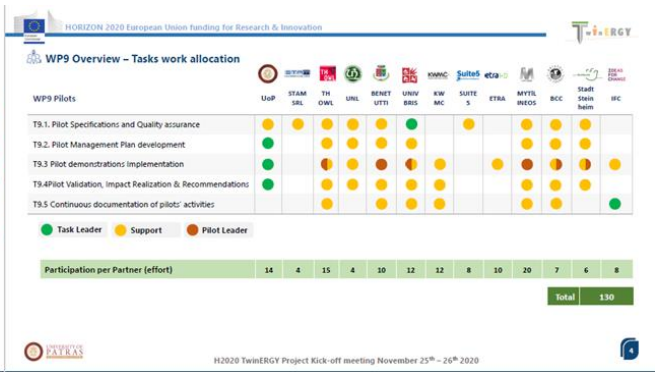
Questions and Answers

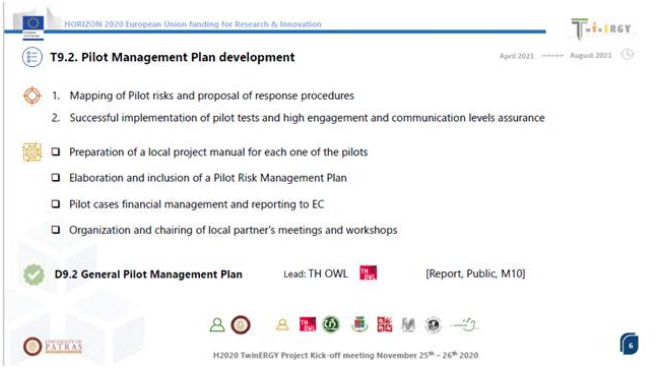
Twinergy has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 957736

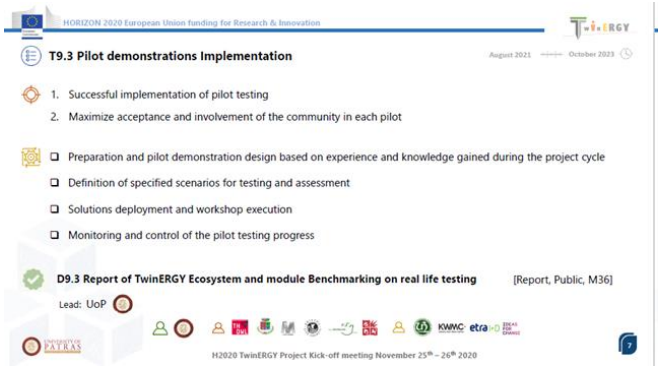
WP9-Pilots

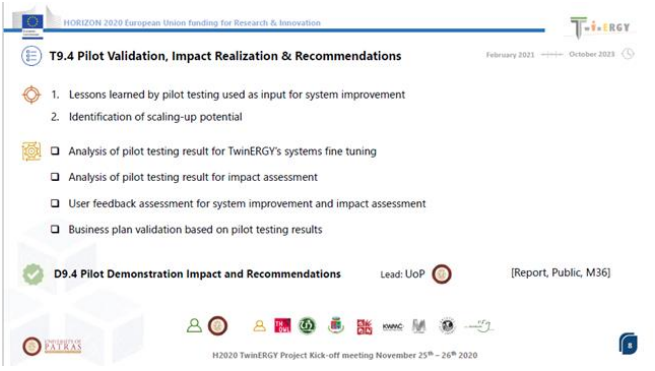












Pilot demonstrations KPIs

Key Performance Indicators	Unit	Athens GR		Bristol City UK		Hagedorn Village GER		Com. Benetutti IT	
		Baseline	After Project	Baseline	After Project	Baseline	After Project	Baseline	After Project
RES share in Energy Consumption	%	-	-	-	-	42	60	70	85
Reduction of peak loads	%	0	35	0	25	0	20	0	20
Self-consumption ratio	%	-	-	-	-	45	60	47	85
Penetration of dynamic energy tariffs	Pricing zones	2	6	2	6	2	6	2	6
Active participation rate through user engagement and acceptance	%	0	95	0	95	0	95	0	95
Customer responsiveness	%	0	90	0	90	0	90	0	90
Total energy reduction against discomfort level constraint	%	0	30	0	12	0	15	0	12
Customer satisfaction	Scale 1 to 10	-	9	-	9	-	9	-	9
Demand Flexibility	%	N/A	10	N/A	10	N/A	10	N/A	10

T9.5 Continuous documentation of pilots' activities

March 2020 ⟶ October 2023

1. Complete documentation of pilot activities
2. Material Production regarding project activities for extroversion purposes

- ❑ Documentation of pilot activities
- ❑ Creation of a shared calendar of recordings for each pilot
- ❑ Data monitoring and material update
- ❑ Pilot testing audiovisual material record and handle

Pilot demonstrations in Greece – Athens

- ✓ Utilization of experience gained by H2020 projects
- ✓ EV mobility aspects integration and assessment
- ✓ High level interest by the pilot leader for business related purposes (value creation for customers beyond pilot phase)

- ❑ Engagement of consumers in demand response programs
- ❑ Provide flexibility to electricity retailer by enabling users to change their consumption patterns
- ❑ Establish optimal Virtual Power Plant (VPP) composition
- ❑ Optimization of DSO business processes and operations

Pilot leader:

45 residential dwellings

150 residents

150 MWh

248.000 €

Pilot demonstrations in the UK – Bristol City and University Campus

- ✓ Utilization of experience based on the One City Plan [1]
- ✓ Utilization of the developed people-led Bristol approach [2]
- ✓ Community level and oriented analysis

- ❑ Introduction of Digital Twin technologies for consumer engagement
- ❑ Collaborate with households for pilot design
- ❑ Empower prosumers' role in energy market
- ❑ Envision the role of local authorities' role in energy service innovation and public value creation

Pilot leader:

Residential and Public

290.445 €

1 https://www.bristolonecity.com/about-the-one-city-plan/
2 https://www.bristolapproach.org/bristol-approach/

Pilot demonstrations in Germany – Hagedorn Village

- ✓ People have already taken part in pilot testing
- ✓ Hofquarter energy interconnected area
- ✓ Data availability

- ❑ Test innovative business models for consumer engagement
- ❑ Increase end-user participation by 50 %
- ❑ Focus on EV mobility integration
- ❑ Test of V2G technology

Pilot leader:

38 house

103 residents

88 MWh

295.720 €

Pilot demonstrations in Italy – Benetutti Community

- ✓ People have already taken part in pilot testing
- ✓ Annual photovoltaic power producibility of 2,200 MWh
- ✓ self-consumption level around 70%

- ❑ Improve predictability of consumption and consumer behavior patterns
- ❑ Test economic incentives as engagement strategy
- ❑ Maximize effectiveness of RES at a community level
- ❑ Validate the scalability of the system

Pilot leader:

98 km² area

2000 residents

3700 MWh

176.830 €

Use Cases' utilization

TwinERGY Use case	Athens GR	Bristol City UK	Hagedorn Village GER	Comune Benetutti IT
UC01 Home Energy Management	✓	✓	✓	✓
UC02 RES Generation in domestic and tertiary buildings		✓	✓	✓
UC03 Grid capacity enhancement utilizing e-mobility	✓		✓	
UC04 Prosumers empowerment in local energy trading markets		✓		✓
UC05 Enhance grid's flexibility through DER Management			✓	✓
UC06 Consumers engagement in Demand Side Management Programs utilizing feedback mechanisms	✓			✓
UC07 Consumer's engagement in demand response programs utilizing a socio-economic context		✓	✓	✓
UC08 Consumer's engagement in demand response programs utilizing personalized comfort/health-oriented services	✓		✓	✓
UC09 Consumer's engagement in demand response programs utilizing digital twins' prediction capabilities for dynamic VVPs	✓	✓	✓	✓

WP10-Exploitation and Business Plans

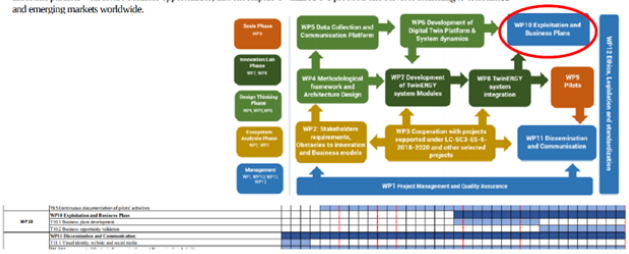
WP10 Exploitation and Business Plans

Lead Beneficiary: UNIVBRIS

University of BRISTOL

Objective and WP role in project

WP10 Exploitation and Business Plans: elaborates the sectorial business analysis conducted in WP2, in order to supply the industrial partners with future business opportunities, that encompass TwinERGY's products and services launching to established and emerging markets worldwide.



WP Tasks, duration and partners involved

T10.1 Business Plans Development (M19-27)

Intended to facilitate development of TwinERGY outcomes exploitation plans by commercial partners (Suite5, ETRA, MYTILINEOS, STAM), supported by expertise from academic partners (UPat, UNL, UNIVBRIS) and Industry Groups (smartEN). Lead by WEC.

Keywords: sector analysis, horizon scanning, business models, disruption, tech adoption

WP Tasks, duration and partners involved (cont'd)

T10.2 Business Opportunity Validation (M28-M36)

Intended to assess viability of proposed TwinERGY outcomes exploitation by above partners through collaboratively run feasibility studies, target groups, company strategy reviews, scenario planning etc., incl. legal barriers examination (ALBV). Lead by UNIVBRIS.

Keywords: barriers and enablers, strategic alignment, value generation

Deliverables

D10.1 Business Analysis/Exploitation Plans (due M27)

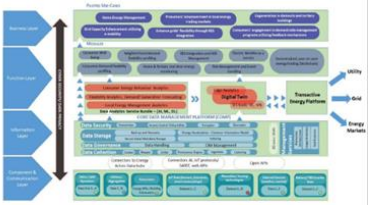
Sector analysis, opportunities identification, technology roadmap, SWOT, avenues to market, competitor analysis

D10.2 Business Opportunities Validation (due M32)

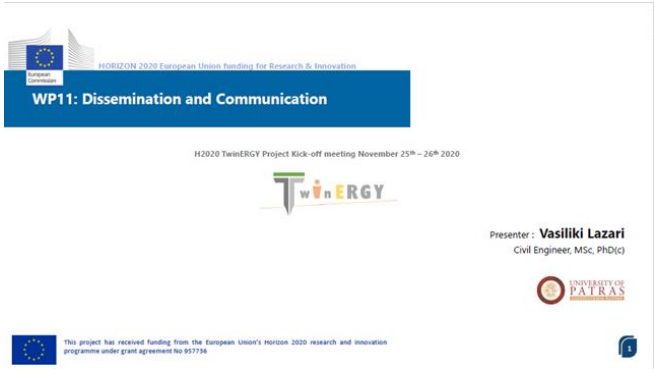
Barriers and enablers, 'IP-worthiness'

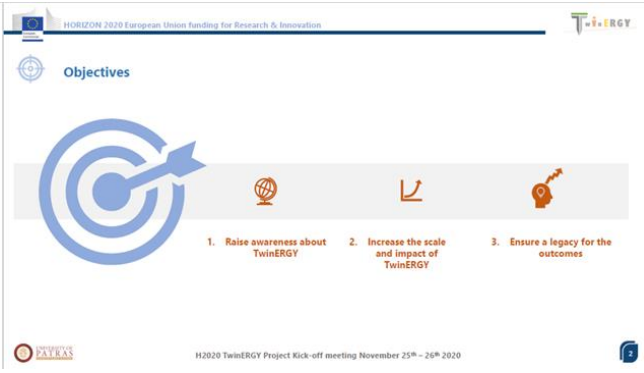
Thank you!

Any questions?



WP11-Dissemination and Communication





HORIZON 2020 European Union funding for Research & Innovation

WP11 Overview - Tasks

Dissemination and Communication

- T11.1 Visual identity, website and social media
- T11.2 Management of Strategic Communication and Dissemination Activities
- T11.3. Citizen Learning & Dissemination
- T11.4. Energy Futures Videos
- T11.5 Networking with related research projects and initiatives

Year 1 | Year 2 | Year 3 | Leader

HORIZON 2020 European Union funding for Research & Innovation

WP11 - Tasks allocation

Task Leader

Support

Dissemination and Communication

T11.1 Visual identity, website and social media	✓
T11.2 Management of Strategic Communication and Dissemination Activities	✓
T11.3. Citizen Learning & Dissemination	✓
T11.4. Energy Futures Videos	✓
T11.5 Networking with related research projects and initiatives	✓
Participation per partner (PMs)	8.00 4.00 2.00 5.00 1.50 2.00 0.50 7.00 2.00 2.00 2.00 4.00 1.00 4.00 1.50 8.00 1.00 4.00
Total	59.50

HORIZON 2020 European Union funding for Research & Innovation

T11.1 Visual identity, website and social media

01/11/2020 - 31/10/2023

1. Create a coordinated communication strategy and brand for the TwinERGY project

- Identify a visual identity and communication guidelines
- Establish a project website (www.twinergy.eu)
- Create associated social media channels (e.g. Twitter - @Twinergy_EU, LinkedIn and YouTube).
- Coordination of press releases and project newsletters

D11.1 Communication guidelines, website, social media Leader: IFC [DEC, PU, M36]

Task Leader: IFC **Support:** UoP, STAM, TH OWL, UNL, IES, BENETUTTI, UNIVBRIS, KWMC, Suite5, ETRA, WEC, MYTILINEOS, BCC, ED, Stadt S., ALBV, smartEN

HORIZON 2020 European Union funding for Research & Innovation

T11.2 Management of Strategic Communication and Dissemination Activities

01/11/2020 - 31/10/2023

1. Coordinate the communication and dissemination activities within the project
2. Ensure effective and inclusive dissemination across a diverge range of audiences

- Document communication/dissemination activities across the lifetime of the project
- Organize two Pan-European workshops

D11.2 Communication and Dissemination Plan Leader: UoP [R, PU, M3]

D11.3 1st European Workshop with stakeholders Leader: KWMC [R, PU, M23]

D11.4 2nd European Workshop with stakeholders Leader: IFC [R, PU, M34]

Task Leader: UoP **Support:** UNL, BENETUTTI, UNIVBRIS, MYTILINEOS, BCC, Stadt S., IFC, smartEN

HORIZON 2020 European Union funding for Research & Innovation

T11.3 Citizen Learning & Dissemination

01/11/2020 - 31/10/2023

1. Focus on engagement with citizens
2. Increase the sharing of learning from the pilot sites

- Co-design engagement activities with citizens
- Organize small local and regional events to increase awareness of pilot demonstrations
- Generate and share media content with task's activities and outcomes

D11.5 Citizen Learning activities/events and report Leader: KWMC [R, PU, M33]

D11.7 Consumer Engagement Handbook Leader: IFC [R, PU, M36]

Task Leader: KWMC **Support:** UoP, TH OWL, BENETUTTI, UNIVBRIS, MYTILINEOS, IFC

HORIZON 2020 European Union funding for Research & Innovation

T11.4 Energy Futures Videos

01/03/2021 - 31/10/2023

1. Increase the outreach of the project
2. Position TwinERGY as a reference project and example of desirable future

- Creation of a video series about pilot experiences
- Collaboration with media to disseminate the video series locally and globally

D11.6 : Energy Futures Videos Leader: IFC [DEC, PU, M34]

Task Leader: IFC **Support:** TH OWL, BENETUTTI, UNIVBRIS, KWMC, MYTILINEOS

HORIZON 2020 European Union funding for Research & Innovation

T11.5 Networking with related research projects and initiatives

01/11/2020 - 31/10/2023

1. Enhance TwinERGY project's knowledge capital
2. Transfer knowledge between different stakeholders

- Coordinate dissemination activities together with other projects under the topics LC-SC3-EC-3-2020, LC-SC3-ES-5-2018-2020 and BRIDGE initiative
- Attend European conferences, fairs and other relevant events

Task Leader: smartEN **Support:** UoP, TH OWL, UNL, UNIVBRIS, KWMC

HORIZON 2020 European Union funding for Research & Innovation

Communication vs Dissemination

Communication	Dissemination
Is about the project in general and its results	Is about project's results only
Targets multiple audiences	Targets audiences that may use the results
Informs and shows the benefits of research to society	Enables the usage and uptake of results
Article 38 of the model grant agreement	Article 29 of the model grant agreement

Both are a contractual obligation !

HORIZON 2020 European Union funding for Research & Innovation

UNIVERSITY OF PATRAS

WP12-Ethics, Legislation and standardization

WP12: Ethics, Legislation & Standardization

ARTHUR'S LEGAL
Dimitra Stefanatou

Kick-off Meeting, TwinERGY Project
25th-26th November 2020

Rule of Law Ecosystem

WP12 Objectives

"(…)to ensure Regulatory, Legal and ethics compliance of the project with the respective EU regulations and legislation.
&
(…) to develop data use licenses to address any data sharing related issues and prevent them from obstructing the project's progress."

Regulatory Landscape: status (November 2020)

Examples of relavant regulations

- NIS: 9 May 2018
- GDPR: 25 May 2018
- Free Flow of Data Regulation: 29 April 2019
- Cyber Security Act & Certification Scheme: 27 June 2019
- Data Governance Act (Proposal): 25 November 2020

2020 & Beyond

Press release | 25 November 2020 | Brussels

Commission proposes measures to boost data sharing and support European data spaces

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To better exploit the potential of ever-growing data in a trustworthy European framework, the Commission today proposes new rules on data governance. The Regulation will facilitate data sharing across the EU and between sectors to create wealth for society, increase control and trust of both citizens and companies regarding their data, and offer an alternative European model to data handling practice of major tech platforms.

The amount of data generated by public bodies, businesses and citizens is constantly growing. It is expected to multiply by five between 2018 and 2025. These new rules will allow this data to be harnessed and will pave the way for sectoral European data spaces to benefit society, citizens and companies. In the Commission's data strategy of February this year, nine such data spaces have been proposed, ranging from industry to energy, and from health to the European Green Deal. They will, for example, contribute to the green transition by improving the management of energy consumption, make delivery of personalised medicine a reality, and facilitate access to public services.

WP12 Tasks' Overview

- T12.1 Identification of Legal & Ethics Requirements (M1-M9)
  Lead: ALBV, Support: Upat, UNL, IFC
- T12.2 Legal & Ethical Compliance monitoring(M10-M36)
  Lead: ALBV, Support: UPat
- T12.3 Regulatory Recommendations and Standardization (M29-M36)
  Lead: smartEN, Support: UPat, UNL, IFC
- T12.4 Data Use Licenses (M1-M3)
  Lead: KWMC, Support IFC

WP12 Outputs

D12.1 Legal & Ethical Compliance Guide	ARTHUR'S LEGAL	M9
D12.2 Legal & Ethical Compliance Report (Interim)	ARTHUR'S LEGAL	M24
D12.3 Legal & Ethical Compliance Report (Final)	ARTHUR'S LEGAL	M36
D12.4 Regulatory Recommendations and Standardization	smartEN	M36
D12.5 Data Use License template	KWMC	M12

ARTHUR'S LEGAL

Thank you for your attention.

Legal Notices