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Grant agreement no. 101123238



**Smart Grid-Efficient Interactive Buildings** 

Deliverable D7.6
Exploitation Roadmap





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Website https://www.evelixia-project.eu/			
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# Deliverable D7.6 Exploitation Roadmap

Deliverable number	D7.6
Deliverable name	Exploitation Roadmap
Lead beneficiary	RINA-C
	This deliverable is directly linked to the activities foreseen in
	Task 7.2. This report is considered as the first version of D7.7,
Description	consolidating EVELIXIA's KERs definition, exploitation
	planning and IPR management activities.
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Туре	Report
Dissemination level	Public
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Contributors	Elisa Crocco (RINA-C), Elena Gallo (RINA-C)





## **Document history**

Version	Date	Changes	Author
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V1 – reviews	21.03.2025	Deliverable review	EI-JKU
VI – consolidated version	24.03.2025	Consolidated Version	RINA-C
2 <sup>nd</sup> review	24.03.2025	Deliverable reviews	NTT-DATA
V2 – consolidated version	30.03.2025	Consolidated Version	RINA-C
Final Version	15.04.2025	Final version of D7.6	RINA-C
Final Deliverable Submission	18.04.2025		CERTH





### **EXECUTIVE SUMMARY**

The Deliverable 7.6 provides a first version of the exploitation and IPR management plan. Although the development activities of the project are still under progress, initial results are starting to become clearer. The report clearly identifies the Key Exploitable Results (KER) that have already surfaced as well as the methodology and particular mechanisms for the protection, exploitation, and sharing of the results produced by the project.

For each of the KERs that have been so far discovered, the following details are provided:

- A brief overview of the key characteristics for the KER;
- The idea's uniqueness in comparison to the market (comparison with alternative solutions);
- The unique selling proposition (value proposition), or competitive advantage;
- A preliminary strategy for future market positioning;
- The market timing and a preliminary overview of the first actions after the end of the project;
- If applicable, a patent scenario analysis;
- The current and future methods to protect the IPRs (Intellectual Property Rights).

Out of the 14 KERs identified, 6 represent products (hardware), while the other 8 are software solutions:





		Delevere	KED	December 21616
KER#	KER Name	Relevant	KER	Responsible
		WP(s)	leader(s)	Partners
	EVELIXIA platform /	WP3,		CERTH, SOLVUS,
1+4	Stakeholders Interaction	WP5,	CERTH	UniGe, CEA, R2M,
	Platform (SW)	VVP5		UBE, IES, CIRCE
_	Autonomous Building Digital			CERTH, UniGe, CEA,
2	Twin (SW)	WP4	CERTH	R2M, IES
	Autonomous District Digital			112111, 120
3	Twin (SW)	WP4	UBE	CERTH, UBE, IES
5	Interoperability and	WP3	CIRCE	CERTH, CIRCE
	Abstraction Services (SW)			'
6	Geothermal Wall System -	WP2	TUCN	TUCN
	(IS24) (HW)	**** =	10011	10011
	Window Solar Shading			
7	Control Using Recycled PV	WP2	TUCN	TUCN
	Cell (IS25) (HW)			
8	V2G EV Charger (IS26) (HW)	WP2	TUCN	TUCN
	Power-to-Hydrogen-to-			
9	Power Compact System –	WP2-5	BER	BER, CERTH
	MOSE (IS27) (HW)			,
10	Hybrid Long-Term Storage	WP2	ENTECH	ENTECH
10	System (IS28) (HW)	VVP2	ENTECH	ENTECH
	Decentralized DHW			
11	preparation solution		PINK	PINK, FHB
	"enerbox" (IS29) (SW/HW)			
12	Building Aggregator Service	VAIDE	NI a a audi d	NI l
	(BAS) (SW)	WP5	Neogrid	Neogrid
13	ESesoft Platform (SW)	WP2	ENTECH	ENTECH
14	SRI Advisor tool (IS7)	WP4	R2M	R2M, CERTH
15	SRI Calculation Methodology	WP6	R2M	
	at District Level	VVPO	R∠IVI	R2M, CERTH

As result of the first analysis, the five KERs showing the highest exploitation potential (based on degree of innovation, exploitability and impact criteria) are:

- 1. The Autonomous District Digital Twin KER 3;
- 2. The Hybrid Long-Term Storage System KER 10;
- 3. The Power-to-Hydrogen-to-Power Compact System MOSE KER 9;
- 4. The EVELIXIA Platform KER 1 + 4;
- 5. The Autonomous Building Digital Twin KER 2.

The current document will be updated and completed to be delivered in its final official form at the end of the project's activities. This report must be considered as a living document as new results/competitors/alternative solutions could emerge before the end of the project.





### **TABLE OF CONTENTS**

LI	ST OF F	IGURES	10
1	INTR	PODUCTION AND OBJECTIVES	12
	1.1	Scope and objectives	12
	1.2	Structure	12
	1.3	Relation to Other Task and Deliverables	13
2	Met	hodology	13
	2.1	Characterization Table	13
	2.2.1 2.2.2	IPRs and patent analysis  IP protection tools  Patent analysis	21
3	Expl	oitation and IPR workshop	26
4	Key	exploitable results	28
	4.1	KERs identification	28
	4.2	KERs prioritization	31
5	KERS	Characterization and international patent scenario overview	34
	<b>5.1</b> 5.1.1	KER 1 + 4: EVELIXIA Platform / Stakeholders Interaction Platform	
	<b>5.2</b> 5.2.1	KER 2: Autonomous Building Digital Twin	
	<b>5.3</b> 5.3.1	KER 3: Autonomous District Digital Twin  KER 3 Characterization Table	42
	<b>5.4</b> 5.4.1	KER 5: Interoperability and Abstraction Services	45
	5.5	KER 6: Geothermal Wall System	
	5.5.1 5.5.2	KER 6 Characterization Table KER 6 international patent scenario overview	
	<b>5.6</b> 5.6.1 5.6.2	KER 7: Window Solar Shading Control Using Recycled PV Cell  KER 7 Characterization Table  KER 7 international patent scenario overview	54
	5.7	KER 8: V2G EV Charger	
	5.7.1 5.7.2	KER 8 Characterization Table	
	<b>5.8</b> 5.8.1 5.8.2	KER 9: Power-to-Hydrogen-to-Power Compact System  KER 9 Characterization Table  KER 9 international patent scenario overview	<b>62</b>
	5.9	KER 10: Hybrid Long-Term Storage System	
	5.9.1 5.9.2	KER 10 Characterization Table	
		KER 11: Decentralized DHW preparation solution "enerbox"	





5.10.1		72
5.10.2	KER 11 international patent scenario overview	74
	R 12: Building Aggregator Service (BAS)	
5.11.1	KER 12 Characterization Table	77
5.12 KE	R 13: ESesoft Platform	79
5.12.1	KER 13 Characterization Table	79
5.13 KE	R 14: SRI Advisor tool	83
5.13.1	KER 14 Characterization Table	83
5.14 KE	R 15: SRI Calculation Methodology at District Level	86
5.14.1	KER 15 Characterization Table	86
6 CONCL	USIONS	90





### **LIST OF FIGURES**

Figure 1: Methodology for Characterization Table completion	14
Figure 2. Exploitation workshop - KER overview	26
Figure 3. Exploitation workshop - IPRs connected to the KER	27
Figure 4. Exploitation workshop - Open points	
Figure 5. KER 6 - Patenting trend	51
Figure 6. KER 6 - Top IPCs	52
Figure 7. KER 6 - Top authorities	52
Figure 8. KER 6 - Top assignees	53
Figure 9. KER 7 - Patenting trend	56
Figure 10. KER 7 - Top IPCs	56
Figure 11. KER 7 - Top authorities	57
Figure 12. KER 7 - Top assignees	57
Figure 13. KER 8 - Patenting trend	60
Figure 14. KER 8 - Top IPCs	60
Figure 15. KER 8 - Top authorities	61
Figure 16. KER 8 - Top assignees	61
Figure 17. KER 9 - Patenting trend	64
Figure 18. KER 9 - Top IPCs	65
Figure 19. KER 9 - Top authorities	65
Figure 20. KER 9 - Top assignees	66
Figure 21. KER 10 - Patenting trend	69
Figure 22. KER 10 - Top IPCs	70
Figure 23. KER 10 - Top authorities	70
Figure 24. KER 10 - Top assignees	71
Figure 25. KER 11 - Patenting trend	
Figure 26. KER 11 - Top IPCs	75
Figure 27. KER 11 - Top authorities	
Figure 28. KER 11 - Top assignees	





### **LIST OF TABLES**

Table 1. Characterization Table blank template. Source: RINA-C	15
Table 2. KERs List	28
Table 3. List of KERs sorted by priority	<i>33</i>
Table 4. KER 1 + 4 - Characterization Table	34
Table 5. KER 2 - Characterization Table	37
Table 6. KER 3 - Characterization Table	
Table 7. KER 5 - Characterization Table	45
Table 8. KER 6 - Characterization Table	48
Table 9. KER 7 - Characterization Table	54
Table 10. KER 8 - Characterization Table	58
Table 11. KER 9 - Characterization Table	62
Table 12. KER 10 - Characterization Table	67
Table 13. KER 11 - Characterization Table	72
Table 14. KER 12 - Characterization Table	77
Table 15. KER 13 - Characterization Table	
Table 16. KER 14 - Characterization Table	
Table 17: KER 15 - Characterization Table	





### 1 INTRODUCTION AND OBJECTIVES

### 1.1 Scope and objectives

D7.6 "Exploitation Roadmap" has as objective to present the preliminary findings of Task 7.2 "EVELIXIA's Exploitation and IPR management", which started at M1 and will end at M48. The document is being created while development efforts are still ongoing but preliminary findings are becoming apparent. The report entails the first official definition of EVELIXIA Key Exploitable Results (KER) which are being developed. The information contained in the report will be updated and integrated into D7.7 "Exploitation Roadmap – update", due at the end of the project.

D7.6 aims to offer a complete list of innovative and exploitable results, which are likely to have an impact when completely developed. Each KER is thoroughly described, with deep dives on their value propositions, target markets, alternative solutions and innovativeness.

The activities performed during the task, which are described in this document, aim to maximize the impact of EVELIXIA results on the scientific community, industry and society at large. Furthermore, the document communicates to relevant stakeholders how the project outcomes will be adopted and sets the basis for the realization of complete and comprehensive exploitation plans.

### 1.2 Structure

The report consists of 6 chapters:

- Chapter 1 represents the introduction of the report;
- Chapter 2 explains the methodology for the development of the first phase of the exploitation strategy;
- Chapter 3 details the first exploitation and IPR workshop;
- Chapter 4 reports the final list of KERs. Furthermore, the results of the prioritization of KERs are presented;
- Chapter 5 offers the characterization of all the Key Exploitable Results and reports the results of the patent analysis for the hardware KERs;
- Chapter 6 reports the conclusion of the document.





### 1.3 Relation to Other Task and Deliverables

T7.2 is not strictly connected with other tasks but builds on contributions and input from all the partners of the project.

### 2 METHODOLOGY

### 2.1 Characterization Table

As already anticipated in deliverable D7.1, a Key Exploitable Result (KER) is an identified interesting result, which has been selected due to its high potential to be "exploited" – meaning to make use and derive benefits – downstream the value chain of a product, process or solution, or act as an important input to policy, further research or education. The identified KERs are listed in Section 4.1.

To adequately develop the exploitation strategy and decide with the partners the Intellectual Property Rights they want to claim on each KER, the main results must be characterized.

The Characterization Table is a questionnaire designed by RINA-C to initiate the collection of information on KERs, to be reviewed, updated, and further integrated during the life of the project. The Table includes questions extracted from the Innovation Radar Methodology<sup>1</sup> (such questions were integrated into the already existing questionnaire between M6 and M7).

In M7, RINA-C sent the Characterization Table to all the responsible partners (the nine KER Leaders). Between M7 and M8, RINA-C collected, reviewed and updated on the shared folder the documents received.

At the end of M8 (the 30<sup>th</sup> of May 2024), RINA-C organized a workshop to point out the main issues and open points identified in the Characterization Tables and then supported the partners in the following months in the document's completion and review. The Characterization Tables were then finalized at the end of M11.

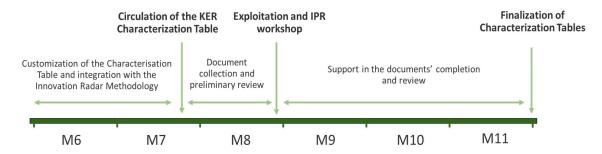
\_

<sup>&</sup>lt;sup>1</sup> https://innovation-radar.ec.europa.eu/methodology/





Figure 1: Methodology for Characterization Table completion



The aim of the questionnaire is to explore the needs or barriers that results are going to solve or overcome, to define who are customers and relevant segments and who are the competitors and their competitive solutions.

The Characterization Table (whose blank template is reported in Table 1) has 6 sections:

- **Problem/Need**: it investigates the problem or need that triggered the development of the KER.
- **Description**: short description of the result.
- **Alternative solution**: it investigates alternative solutions, and their differences compared to the solution developed by the Consortium.
- **Early adopters**: it indicates the expected early adopters of the solution.
- Value proposition: it investigates what is the unique selling point of the solution, indicating what problems and needs are solved and how.
- Market: it indicates the target market, the competitors, the feasible business models, the go-to-market timing and the presence of IPR Background and Foreground.





### Table 1. Characterization Table blank template. Source: RINA-C

Involved parti	
KER Leader(s)	
Other owners	
Problem /need	<ul> <li>Is this:</li> <li>         □A technical need. Please detail (e.g. higher performance, longer duration, different features, different standards)</li></ul>
	□A financial/cost need. Please detail (e.g. lower CAPEX or OPEX, lower price, faste return on investment)
	<ul> <li>         □A sustainability need. Please detail (e.g. lower consumption, lower level of pollutant different social impact)</li></ul>
	Geographical level:
	□Local /national (please specify)
	<ul> <li>□Local, linked e.g. to climate zones or other specific local contexts (please specify)</li> </ul>
	□European
	□Global
	Does the need come from:
	□Private customers
	□Business/industrial customers
	□Public entities
	□ Other (please specify)
Description	What is the nature of the KER?
Description	
	—9
	Significantly improved service (except consulting services)    Constitution   Constitution
	Significantly improved process    Significantly improved process   Significantly improved proc
	Significantly improved marketing method  The state of the state o
	Significantly improved organizational method
	•   Consulting services
	New product
	New service (except consulting services)
	New process
	□New marketing method
	□New organizational method
	Other (please specify)
	Please provide a description of the KER.
	What is the level of innovation?  ■ □Some distinct, probably minor, improvements over existing products
	□Innovative but could be difficult to convert customers
	<ul> <li>□Obviously innovative and easily appreciated advantages to customers</li> </ul>
	□Very innovative
Alternative solution	Probably, there's already one (or several) solution to the problem available in the marke but:
	□It doesn't solve the full problem
	□It is difficult to implement
	□It is not commercially mature
	□It is mature but not robust enough
	□It is expensive
	Other (please specify)
	Can you make a list of 3/4 products (or services) already available in the market that ar trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.
	A Link:
	B Link:
	C Link:
	D Link:
	Can you find a main drawback or a limitation for each of the alternative solutions yo provided?





B.	
C.	
D.	

Has your company (or someone in the consortium) already developed a solution for the identified need before this project started?

- □Yes
- □No

Can we say that this solution is the starting point of the current project development activities?

- □Yes
- □No

If "Yes" then please specify the product or service already developed ("the starting point").

Let's compare the KER with what we already had in the consortium. What are the main advancements respect to the "starting point" (the initial solution available in the consortium)? If possible, please give numerical figures that can quantify advancements.

- Decreased production (manufacturing) time
- Decreased production (manufacturing) costs
- Improved flexibility for diverse applications
- DImproved design, size, weight, efficiency, materials
- ■New features

- □Remote operability
- Improved safety
- 🗆 Improved logistics, distribution
- Improved maintenance plan
- Improved environmental impact
- New business model (e.g. for self-payback)
- □Other please specify

Let's make some comparison with the benchmark. What are the main advancements respect to the alternative solutions (A, B, C, D) you have previously identified? If possible, please give numerical figures that can quantify advancements.

### Alternative solution A

- Decreased production (manufacturing) time
- Decreased production (manufacturing) costs
- 🛮 Increased lifetime and or robustness
- □Improved flexibility for diverse applications
- Improved technical performances (please specify)
   Improved design, size, weight, efficiency, materials
- □New features
- □Improved customizability
- Improved connectivity
- Remote operability
- □Improved interoperability
- □Improved safety
- 🗆 Improved logistics, distribution
- □Improved maintenance plan
- □Improved environmental impact
- New business model (e.g. for self-payback)
- □Other please specify

#### Alternative solution B

- Decreased production (manufacturing) time
- Decreased production (manufacturing) costs
- □Increased lifetime and or robustness





- Improved design, size, weight, efficiency, materials
- ■New features

- □Remote operability
- □Improved safety
- □Improved logistics, distribution
- Improved construction/installing phase
- 🛮 Improved maintenance plan
- Improved environmental impact
- New business model (e.g. for self-payback)
- □Other please specify

#### Alternative solution C

- □Decreased production (manufacturing) time
- Decreased production (manufacturing) costs
- □Increased lifetime and or robustness
- Improved technical performances (please specify)
- □Improved design, size, weight, efficiency, materials
- ■New features
- Improved customizability
- Improved user friendliness
- Improved connectivity
- □Remote operability
- Improved interoperability
- □Improved safety

- □Improved environmental impact
- □New business model (e.g. for self-payback)
- □Other please specify

#### "Market" – Early Adopters

**Difference between Customer and User** → The customer is the entity (person, company) that buys the product/service/solution.

The user is the entity (person, company) that uses the product/service/solution, once bought and implemented.

To be effectively proposed to the market, the product/service/solution must pay attention to needs and reflect expectations of both.

Example 1: I buy a car: I am the customer AND the user

Example 2: I buy a toy for my kids: I am the customer, my kids are the users

Example 3: My company buys a new SCADA system: the procurement office is the buyer, the employees and technicians are the users

Who are the potential early customers for this KER? Please make sure they reflect your choices in the Need/Problem section (e.g. type of customer, geography)

- □Individuals
- □Private Small or medium enterprises
- □Non-profit organizations
- □Public bodies / authorities
- □Research and academic bodies
- □Other, please specify

Please name a	few	potential	customers:
---------------	-----	-----------	------------

- 2. .....
- Who are the potential final users?





- □Industry:
  - o □One or several managers
  - o □One specific technical profile
  - o Done specific department/team
  - o □Individuals
  - o □Other
- Non-profit organizations
  - o □One or several managers
  - o 

    One specific technical profile
  - o □One specific department/team

  - o □Other
- ■Public bodies / authorities
  - o One or several managers
  - o 

    ☐One specific technical profile
  - o □One specific department/team

  - o □Other
- Research and academic bodies
  - o Done or several managers
  - o One specific technical profile
  - o □One specific department/team
  - o □Students
  - o □Other
- DOther, please specify

### For the private company/companies, will this innovation be used by mainly current or new customers?

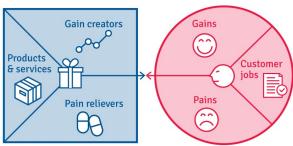
- New customers

#### Value proposition - Customer profile

INFOBOX: Let's identify the value proposed by the KER under investigation.

### Value Proposition

### **Customer Profile**



The potential customer can be profiled by considering:

- The typical activities the customer usually performs (Customer Jobs)
- The typical pains that the customer feels or has during these activities or that can be caused by the activity itself, if not properly managed (Customer Pains)
- The typical gains that the customer can achieve during or thanks to these activities, if properly managed (Customer Gains)

Let's see what's relevant for the KER under investigation:

### What are the activities (Customer jobs) the customer usually performs, where our KER would be needed?

Example: the customer checks regularly the energy consumption

Example: the customer must make seasonal adjustments of settings in energy management

Example: the customer needs pre-heating for some processes

- 1. ......
- 2. .....
- 3. .....





	4
	5
	J
	What are the pains the customer encounters while doing the previous activities?
	Example: the customer does not have a tool for monitoring energy consumption
	Example: the customer only has rough, aggregated data
	Example: the customer has no direct access to the control dashboard and should ask a
	third party for adjustments
	2
	3
	4
	5
	What are the gains the customer aims at, while doing the previous activities?
	Example: the customer wants to reduce the energy bill
	Example: the customer wants to keep comfort parameters under control, according to
	outside conditions
	Example: the customer has environmental targets to achieve
	1
	2
	3
	4
	5
	5
Value	CUSTOMER JOBS:
proposition	Please confirm in which customer activity/process the KER can be integrated and how
	much it is relevant (refer to the activities identified in the previous section):
	· · · · · · · · · · · · · · · · · · ·
	<ul> <li><u>Activity 1</u>: How much is the KER crucial to perform the activity?</li> </ul>
	<ul> <li>□Indispensable</li> </ul>
	<ul> <li>□Core, but needs to work in synergy with other components/processes</li> </ul>
	<ul> <li>□Complementary to a core solution</li> </ul>
	□Nice to have
	Activity 2: How much is the KER crucial to perform the activity?
	<ul> <li>□Indispensable</li> </ul>
	·
	<ul> <li>□Core, but needs to work in synergy with other components/processes</li> </ul>
	<ul> <li>□Complementary to a core solution</li> </ul>
	□ Nice to have
	<u>Activity 3</u> : □ The KER can be integrated □ The KER cannot be integrated How much is
	the KER crucial to perform the activity?
	• □Indispensable
	<ul> <li>□Core, but needs to work in synergy with other components/processes</li> </ul>
	□Complementary to a core solution
	· · · · · · · · · · · · · · · · · · ·
	□Nice to have
	CUSTOMER PAINS:
	What are the pains – among those previously listed – the KER can help reducing or avoiding
	(refer to the pains identified in the previous section)?
	1
	2How?
	3How?
	CUSTOMER GAINS:
	What are the gains – among those previously listed – the KER can help achieving (refer to
	the gains identified in the previous section)?
	the gams identified in the previous section;
	1How?
	2
	3How?
"Market" –	What is the primary target market?
Target	<ul> <li>□Energy production/distribution/consumption</li> </ul>
market	
market	<ul> <li>□Heavy process Industry (energy intensive)</li> </ul>
	□Manufacturing Industry
	<ul> <li>□Information Technology and telecommunication</li> </ul>
	<ul> <li>□Construction</li> </ul>
	□Real estate management
	□Other (please specify)
	Dlease specify the most relevant sub-sector(s) of the KFD within the selected market





	The market targeted by thi	s innovation is:			
	□ The market is not		d it is not yet clear	that the innova	ation has potential
	to create a new ma				
	<ul> <li>□The market is not market</li> </ul>	yet existing, bu	t the innovation h	as clear potent	ial to create a new
	□ Emerging: There	is a growing de	mand and few off	erings are avai	ahle
	□ Mature: The marl			-	
	of the type propose		ppou **********************************	p. 5 4 4 5 5 (5 5 . 1	,
	Market dynamics: is the ma	arket?			
	<ul><li>□ In decline</li><li>□ Holding steady</li></ul>				
	□ Growing				
	_ = 0.000.19				
	Are there other markets fo	r this innovatio	n that the innova	tors are not ye	et targeting?
	• 🗆 Yes				
	• □ No				
	Market competition: How strong is competition in the target market?				
	• □ Patchy, no major		-		
	<ul> <li>□ Established con</li> </ul>	mpetition but	none with a p	roposition like	the one under
	investigation			·	, cc ;
"Market" -	Several major pla				
Competitors	Please make a list of the coproviders of the alternative				manuracturers /
	□ <u>SMEs</u> :		<b>,</b>	<b>,</b>	
	1				
	2				
	3				
	1				
	2				
	3				
	□ <u>Research bodies /a</u>				
	2				
	3				
	□ <u>Others</u> : 1				
	1 2				
	3				
Go to	What are the relevant Bus				
Market – Business	and examples of business i	nodels, please Not	refer to the last p Scarcely	ages of this d	very well
model	Business Model	applicable	applicable	Applicable	applicable
	Subscription model				
	Bundling model				
	Freemium model				
	Razor blades model				
	Product to service model				
	Leasing model				
	ESCO - energy				
	performance contract				
	ESCO - energy supply				
	contract				
	ESCO - build-own- operate-transfer				
	Franchise model				
	Distribution model				
	Manufacturer model				
	Retailer model			<del>                                     </del>	
	Poor to poor model				





	Hidden revenue model
	Direct sales model
	Affiliate marketing
	model
	Consulting model
	Data licensing model
	Pay as go model
	Software as a service
	Product as a service
	Other
Go to Market - Timing	Please make an initial high-level description of the actions to be performed after the end of the project, to make the solution ready to market - TRL9 (ATTENTION! The detailed list of actions will be managed in the Exploitation Checklist):   During the first month after the project:
	1
	2
	3
	□ <u>Within 6 months</u> after the project:  1
	2
	3
	☐ <u>Within 12 months</u> after the project:
	1
	2 3
	3
	1
	2
	3
Go to	Please check <b>if there is any type of Intellectual property already secured</b> (before the project
Market –	started) and that helped the development of the solution. For definition and examples of IP
IPR	instruments, please refer to the last pages of this document.
Background	Type Owner
	Patent
	Trade secret
	Copyright
Go to	Trademark  Disass shock if the developed solution (within the and of the project) could be protected.
Go to Market –	Please check if the developed solution (within the end of the project) could be protected with one (or more) type of Intellectual property:
IPR	Type Owners
Foreground	Patent
	Trade secret
	Copyright
	Trademark

### 2.2 IPRs and patent analysis

### 2.2.1 IP protection tools

The most appropriate type of IP protection, its length, and its geographic scope are determined by the product as well as by the economic strategies for its exploitation. The main IP protection tools are patent, utility model, industrial design, copyright, trademark and trade secret.





#### 2.2.1.1 Patent

As defined by the U.S. Patent and Trademark Office (USPTO), a patent is a type of limited-duration protection that can be used to protect inventions (or discoveries) that are new, non-obvious, and useful, such as a new process, machine, article of manufacture, or composition of matter. When a property owner holds a patent, others are prevented, under law, from offering for sale, making, or using the product<sup>2</sup>.

### 2.2.1.2 Utility model

A Utility Model is an exclusive right granted for an invention, which allows the right holder to prevent others from commercially using the protected invention, without his authorization and for a limited period (usually between 7 and 10 years, without the possibility of extension or renewal). It may be any useful machine, implement, tools, product, composition, process, improvement or part of the same, that is of practical utility, novelty and industrial applicability. In practice, protection for utility models is often sought for innovations of a rather incremental character that may not meet the patentability criteria. Although a utility model is like a patent, it is generally cheaper to obtain and maintain, it has shorter grant lag, and less stringent patentability requirements<sup>3</sup>.

#### 2.2.1.3 Industrial design

Industrial Design is a type of protection dedicated to the intellectual creation used by designers; it is provided for a shape, configuration, surface pattern, color, or line (or a combination of these), which, when applied to a functional product, produces or increases aesthetics, and improves the visual appearance of the design, be it a two-dimensional or a three-dimensional product. The subject of design protection is the outwardly visible appearance of the product or its part, packaging or the ornamentation itself<sup>4</sup>.

<sup>3</sup> Utility models (wipo.int)

<sup>&</sup>lt;sup>2</sup> Patents (wipo.int)

<sup>&</sup>lt;sup>4</sup> Industrial Designs (wipo.int)





### 2.2.1.4 Copyright

Copyrights protect non-technical intellectual creations; in practice, it refers to all the rights owned by creators over their literary or artistic work. To be protected by copyright, a work must first have sufficient originality and, second, have taken form. Protection arises automatically giving the holder the exclusive right to control reproduction or adaptation<sup>5</sup>.

#### 2.2.1.5 Trademark

Trademarks refer to phrases, words, or symbols that distinguish the source of a product or services of one party from another. For example, the Nike symbol—which nearly all could easily recognize and identify—is a type of trademark. While patents and copyrights can expire, trademark rights come from the use of the trademark and therefore can be held indefinitely. Like copyright, registration of a trademark is not required, but registering can offer additional advantages<sup>6</sup>.

#### 2.2.1.6 Trade secret

Trade secrets refer to specific, private information that is important to a business because it gives the business a competitive advantage in its marketplace. If a trade secret is acquired by another company, it could harm the original holder. Examples of trade secrets include recipes for certain foods and beverages (like Mrs. Fields' cookies or Sprite), new inventions, software, processes, and even different marketing strategies. When a person or business holds a trade secret protection, others cannot copy or steal the idea. To establish information as a "trade secret," and to incur the legal protections associated with trade secrets, businesses must actively behave in a manner that demonstrates their desire to protect the information. Trade secrets are protected without official registration; however, an owner of a trade secret whose rights are breached—i.e. someone steals their trade secret—may ask a court to ask against that individual and prevent them from using the trade secret.

<sup>&</sup>lt;sup>5</sup> Copyright (wipo.int)

<sup>&</sup>lt;sup>6</sup> Trademarks (wipo.int)

<sup>&</sup>lt;sup>7</sup> <u>Trade Secrets – Everything you need to know (wipo.int)</u>





### 2.2.2 Patent analysis

Patent analysis is the systematic examination and evaluation of patents to gain insights into technological advancements, competitive landscapes, and intellectual property strategies, enabling informed decision-making and fostering innovation.

For this purpose, the comprehensive tool for IP research PATSNAP has been used by RINA-C. It offers a platform for patent research and analytics that provides access to internationally recognized patents and scholarly publications. Its improved content, in-house search engines, and data intelligence technology aid IP experts in finding solutions to challenging problems.

PATSNAP allows users to perform several activities:

- Clearance, state-of-the-art search, right-to-use and freedom-to-operate searching. This examination verifies if you have the right to work in a certain technological field and minimize the possibility of infringement. With the use of the technology, companies can analyze patents in many different nations' native tongues (such as Germany, Japan, Korea, and China) and continuously perform analyses to reduce the likelihood of infringement. Reviewing published patents, applications, non-patent literature, and technological trends might help with this.
- Competitive and technical intelligence searching. With the use of artificial intelligence, the instrument assists in performing competitive, technical, and strategic intelligence.

The report will show charts and numbers regarding the competitive scenario, beneficial to handle the exploitation difficulties of the project, rather than a one-to-one analysis of findings. Patent analysis is, in fact, a very powerful tool to investigate the market in which the proposed solutions are intended to be commercialized/used and should be performed even if the developed technologies will not be protected by a patent. This is the case for EVELIXIA, as these considerations (on which kind of IP protection tools will be used for project results) will be developed at a later stage.

For each KER, the patents found by means of PATSNAP were analyzed in terms of their application trend, their IPC category, the geographic area to which they belong and the main assignees. Each of these characteristics and the information that can be derived from it in terms of exploitability is described below.





In the scope of EVELIXIA, patent analysis was performed only for the hardware solutions. As software is generally not patentable in the EU, performing the analysis for the software solutions could generate misleading results.

#### 2.2.2.1 Patenting trend

The number of patent applications filed annually is the first statistic that appears for each analysis (only patents published from 2010 were analyzed). This graphic provides key details about the technology/industry considered. First, the quantity of patents reflects the level of industry commitment and worldwide interest in creating new intellectual property for a specific technology.

### 2.2.2.2 Top IPC and key areas of research

The IPC (International Patent Classification) code is a crucial piece of patent information. The technological cluster to which the patent belongs is revealed by this code, which may be deciphered digit by digit to the required degree of detail. The examination of IPCs makes it feasible to identify the most active research subdomains on a worldwide scale.

By examining the recurring keywords (found, for example, in the patents' titles and abstracts) and clustering the discovered patents in accordance with them, a parallel analysis may be carried out.

#### 2.2.2.3 Geographic areas and markets

A patent can be filed in one country or many nations (national patent), on a whole continent (as in the case of EU patents), or anywhere in the globe, regardless of the nationality or geographic location of the assignee. This reveals the patents' territorial scope, or the nations in which the protected intellectual property can be "used" (commercialized, licensed, or sold). The top nations and regions of coverage are displayed in the charts.

#### 2.2.2.4 Assignees

The individual who is the owner of the IP created and disclosed in a patent is known as the applicant (assignee). To comprehend who generated the know-how and gain some insight into the engagement of major firms, small businesses, colleges, etc., a chart with the primary applicant will be supplied for each use case.





### 3 EXPLOITATION AND IPR WORKSHOP

An exploitation and IPR workshop were held online by RINA-C on the 30<sup>th</sup> of May 2024, involving all the partners. It was aimed at reviewing the KER table and the characterization of every single KER.

For each KER, three different slides were prepared:

- A slide with the name of the KER, involved partners, KER nature and a short description of the result (see Figure 2);
- A slide focusing on the IPRs connected to the KER (see Figure 3);
- A slide with the open points (see Figure 4).

Figure 2. Exploitation workshop - KER overview

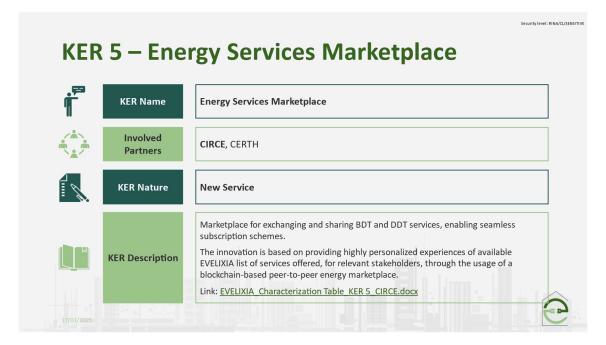






Figure 3. Exploitation workshop - IPRs connected to the KER



Figure 4. Exploitation workshop - Open points







### **4 KEY EXPLOITABLE RESULTS**

### 4.1 KERs identification

The KERs identification is the starting point for the exploitation activities, as already described in D7.1.

The main purpose of the Key Exploitable Results list is to establish the results developed throughout the project so far. The list, which will be constantly updated during the project, includes the following information:

- Name of KER: clear and concise label for the KER. It is technically accurate
  and visually appealing for dissemination purposes.
- **Relevant WP(s)**: work package(s) where the KER is designed, developed, demonstrated, and tested.
- **Leading partner**: the partner responsible for developing the KER. Generally, it is the one with the most significant responsibilities (task leaders, WP leaders, intellectual property owners).
- **Involved partners**: all partners involved in the relevant WP(s) and directly connected to actions related to the KER.

Table 2. KERs List

KER #	KER Name	KER description	Relev ant WP(s)	KER leader (s)	Responsibl e Partners
1+4	EVELIXIA platform / Stakeholders Interaction Platform (SW)	Incorporate Web3 technologies to collect and organize energy services and users into a federated blockchain ecosystem.	WP3, WP5	CERT H	CERTH, SOLVUS, UniGe, CEA, R2M, UBE, IES, CIRCE
2	Autonomous Building Digital Twin (SW)	ABDT employs cutting-edge technology and data-driven algorithms to create a real-time model of a building's energy systems. This enables optimal management, automation, and decision-making, enhancing sustainability and efficiency within the broader context of Building as Utility Nodes (BAUNs).	WP4	CERT H	CERTH, UniGe, CEA, R2M, IES





3	Autonomous District Digital Twin (SW)	ADDT extends the BAUNs vision to districts and aims to optimize energy management at a district scale. Addressing diverse energy goals, it optimizes inter-building energy exchanges and enables automated decision-making for holistic system planning, operation, and maintenance across building and grid levels.	WP4	UBE	CERTH, UBE, IES
5	Interoperabili ty and Abstraction Services (SW)	Enable the federation of heterogeneous data sources originating from multiple vendors, multiple vectors, and devices through the EVELIXIA Interoperability Abstraction Services.	WP3	CIRCE	CERTH, CIRCE
6	Geothermal Wall System – (IS24) (HW)	Install an exterior piping system on underground walls, efficiently extracting renewable energy from the surrounding geothermal field. Seamlessly connected to a soil-water heat pump with a COP of ~4, it ensures effective heating and cooling. This technology able to overcome the limitations of conventional geothermal applications in urban areas for the first time applied to existing buildings.	WP2	TUCN	TUCN
7	Window Solar Shading Control Using Recycled PV Cell (IS25) (HW)	Revamp micro-PV panels with modern components for customizable BIPV modules, ensuring local PV circularity. Rigorous performance tests will determine the optimal on-grid or microinverter configuration, in the context of Maximum Power Point Tracking.	WP2	TUCN	TUCN
8	V2G EV Charger (IS26) (HW)	Develop a targeted micro- regulation strategy for V2G chargers (IS26) using local building insights from TUCN's upcoming monitoring system. This approach aims to enhance the cost-effectiveness of V2G operations by optimizing energy usage from EV batteries during peak demand, reducing costs.	WP2	TUCN	TUCN





9	Power-to- Hydrogen-to- Power Compact System – MOSE (IS27) (HW)	Small scale (10-100 kW) easy to install (from a safety point of view) Power-to-hydrogen-to-power system for single family/multi-family buildings composed by a PEM electrolyzer, Metal Hydride storage and a fuel cell integrated with a smart controller to optimize the management and able to dialogue with BEMS to maximize RES consumption	WP2- 5	BER	BER, CERTH
10	Hybrid Long- Term Storage System (IS28) (HW)	Design and integrate an optimized hybrid storage system for the long-term storage of renewable energy, ensuring interoperability among all components and optimal system control. The system includes a 50 kWe electrolyzer combined with a 20-30 kWe fuel cell, hydrogen storage, and a Li-ion storage system. Bidirectional AC/DC converters, specifically designed for EV charging station applications, will be utilized to reduce costs and enhance stability and efficiency.	WP2	ENTE CH	ENTECH
11	Decentralized DHW preparation solution "enerbox" (IS29) (SW/HW)	System of thermal storage tanks providing temporal flexibility of heating and DHW loads, while leading to the minimization of thermal losses and peak demand, and thus, acting as a provider of load balancing services for the district heating operators.		PINK	PINK, FHB
12	Building Aggregator Service (BAS) (SW)	An IT tool for monitoring and control of flexible energy resources within a local area supplied with electricity and district heating. The BAS can also optimize the operation of the devices according to various goals, such as maximized self-consumption, reduced peak load on grid etc.	WP5	Neogr id	Neogrid
13	ESesoft Platform (SW)	Develop a hypervisor solution in a secure cloud computing environment to manage and oversee industrial selfconsumption with storage operations, providing optimal	WP2	ENTE CH	ENTECH





		energy dispatch and necessary control input.			
14	SRI Advisor tool (IS7)	The tool provides building owners and managers with tailored recommendations on how to improve their SRI score.	WP4	R2M	R2M, CERTH
15	SRI Calculation Methodology at District Level	An expanded replicable methodology, which quantifies the amount buildings can contribute to actively storing and dispatching energy within a district.	WP6	R2M	R2M, CERTH

### 4.2 KERs prioritization

Given the high number of results and the importance of setting priorities, the list of KERs has been prioritized.

The prioritization was based, as suggested by the European Commission<sup>8</sup>, on three factors:

- **Degree of Innovation (DI)**: it refers to how much something is new or different compared to what already exists. It's a measure of how groundbreaking or inventive the KER is. If it introduces a lot of fresh and unique elements, it has a high degree of innovation. On the other hand, if it's more similar to existing things, the degree of innovation is lower.
- Exploitability (Ex): it refers to how easily and effectively it can be used or taken advantage of for practical purposes. It's about assessing how well the KER can be applied to create value or solve problems. The more exploitable an innovation is, the more accessible and usable it is in real-world situations. It's a measure of how readily the benefits of the innovative solution can be harnessed or "exploited" for practical or economic gain.
- Impact (Im): is the influence or effect it has on the world. It measures how much of a difference or change the KER brings in society, economy, or a particular field. The greater the impact, the more significant and far-reaching

-

<sup>&</sup>lt;sup>8</sup> EC, European Commission, <a href="https://ec.europa.eu/newsroom/informatics/items/689551">https://ec.europa.eu/newsroom/informatics/items/689551</a>





the consequences of the innovation. In simple terms, it's about understanding how much the KER shakes things up or makes a difference in the real world.

Partners were asked to perform an evaluation on a Likert scale of 1 to 5 for degree of innovation, exploitability and impact for each one of the KERs via an online form. The form was distributed to the entire Consortium, and 15 responses were collected.

The final Priority Value (<u>PV</u>) for each KER is calculated as follows:

### $PV(KER_x) = AVG[DI(KER_x)] + AVG[Ex(KER_x)] + AVG[Im(KER_x)]$

The list of prioritized KERs is then obtained ordering the KERs by <u>PV</u> descending value. The most prioritized result is the one with the highest <u>PV</u>.





Table 3. List of KERs sorted by priority

KER #	KER Name	Degree of Innovation (DI)	Exploitability (Ex)	Impact (Im)	Priority Value (PV)
3	Autonomous District Digital Twin (SW)	4,20	3,80	3,93	3,98
10	Hybrid Long-Term Storage System (IS28) (HW)	4,07	3,73	3,93	3,91
9	Power-to-Hydrogen-to- Power Compact System – MOSE (IS27) (HW)	4,00	3,73	3,80	3,84
1+4	EVELIXIA platform (SW)	3,87	3,80	3,70	3,80
2	Autonomous Building Digital Twin (SW)	3,80	3,67	3,93	3,80
11	Decentralized DHW preparation solution "enerbox" (IS29) (SW/HW)	3,67	4,00	3,60	3,76
12	Building Aggregator Service (BAS) (SW)	3,73	3,67	3,73	3,71
15	SRI Calculation Methodology at District Level	3,73	3,80	3,53	3,69
13	ESesoft Platform (SW)	3,47	3,80	3,60	3,62
6	Geothermal Wall System – (IS24) (HW)	3,93	3,53	3,33	3,60
8	V2G EV Charger (IS26) (HW)	3,13	3,93	3,73	3,60
7	Window Solar Shading Control Using Recycled PV Cell (IS25) (HW)	3,87	3,53	3,33	3,58
14	SRI Advisor tool (IS7)	3,27	3,73	3,27	3,42
5	Interoperability and Abstraction Services (SW)	3,60	3,13	3,13	3,29





# 5 KERS CHARACTERIZATION AND INTERNATIONAL PATENT SCENARIO OVERVIEW

# 5.1 KER 1 + 4: EVELIXIA Platform / Stakeholders Interaction Platform

### 5.1.1 KER 1 + 4 Characterization Table

Table 4. KER 1 + 4 - Characterization Table

Name of the I	KER: EVELIXIA Platform / Stakeholders Interaction Platform (SW)				
Involved part	ners: CERTH, CIRCE, R2M				
KER Leader(s	): CERTH				
Problem	Is this:				
/need	<ul> <li></li></ul>				
	different standards) - This is the core platform of the project and the single point of				
	entry for the stakeholders				
	Geographical level:				
	• ⊠European				
	⊠Global  Does the need come from:				
	MPrivate customers				
	MBusiness/industrial customers				
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
Description	What is the nature of the KER?				
	⊠New product				
	New service (except consulting services)				
	New process				
	New organizational method				
	Please provide a description of the KER.  The integrated digital EVELIXIA platform will be used for testing and pilot deployments. The platform				
	will be modular and customizable, so that different instances of the platform, which may include				
	potentially different subsets of the overall components, will be seamlessly produced to be used in				
	each pilot, considering the specificities of each pilot.  What is the level of innovation?				
	<ul> <li>         MObviously innovative and easily appreciated advantages to customers     </li> </ul>				
Alternative	Probably, there's already one (or several) solution to the problem available in the market, but:				
solution	It doesn't solve the full problem				
	Can you make a list of 3/4 products (or services) already available in the market that are trying				
	to solve the same need as this KER? If possible, please provide a link to a reference website for				
	further information.				
	No alternative solutions were identified at this stage.				
	Has your company (or someone in the consortium) already developed a solution for the identified				
	need before this project started?				
	Can we say that this solution is the starting point of the current project development activities?				
	• ⊠No				
"Market" -	Who are the potential early customers for this KER? Please make sure they reflect your choices				
Early	in the Need/Problem section (e.g. type of customer, geography)				
Adopters	⊠Individuals				
•	SAssociations of individuals				
	⊠Private Small or medium enterprises				
	Merivate Small of medium enterprises     Merivate Large enterprises				
	MPublic bodies / authorities				
	· · · · · · · · · · · · · · · · · · ·				
	⊠Research and academic bodies				
	Diagon name a few material eventements				
	Please name a few potential customers:				
	Building owners/ users / facility managers.      Transition or Distribution Operators (TSO & DSO)				
	2. Transition or Distribution System Operators (TSO & DSO)				





	3. Aggregators					
	Who are the potential final users?					
	MIndividuals					
	Industry:     Public bodies / authorities					
	Mesearch and academic bodies					
	Mesedicitatia academic bodies					
	For the private company/companies, will this innovation be used by mainly current or new					
	customers?					
	Show customers					
Value	New customers  Let's see what's relevant for the KER under investigation:					
proposition -	Let's see what's relevant for the KEK under investigation.					
Customer	What are the activities (Customer jobs) the customer usually performs, where our KER would be					
profile	needed?  1. The customer wants to be informed about the energy performance of their asset					
	<ol> <li>The customer wants to be informed about the energy performance of their asset</li> <li>The customer wants to change some things to increase the energy performance/ lower</li> </ol>					
	energy cost (e.g. subscribe to services that help them with the operation of their assets)					
	What are the pains the customer encounters while doing the previous activities?					
	The customer usually doesn't have a common place to access and review all the operational					
	data and building documentation					
	2. The customer isn't aware of the possible building operation actions that can increase the					
	energy efficiency while providing flexibility services to the grid					
	What are the gains the customer aims at, while doing the previous activities?					
	The customer reduces the cost of energy     The customer is better informed to take advantage of the possible enpertunities provided.					
	2. The customer is better informed to take advantage of the possible opportunities provided by the grid operation by enabling an automated service to do it					
Value proposition	CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it					
proposition	is relevant (refer to the activities identified in the previous section):					
	Activity 1: How much is the KER crucial to perform the activity?					
	Substitution       Substitution      Substitution       Substitut					
	Activity 2: How much is the KER crucial to perform the activity?					
WA 1	• 🛮 Indispensable					
"Market" – Target	What is the primary target market?  • ⊠Energy production/distribution/consumption - primary					
market	Maching production/distribution/consumption - primary     Maching production/distribution/consumption - primary					
	The market targeted by this innovation is:					
	The market is not yet existing but the innovation has clear potential to create a new market					
	■ Emerging: There is a growing demand and few offerings are available					
	Market dynamics: is the market?					
	Market competition: How strong is competition in the target market?					
	<ul> <li>         \infty Established competition but none with a proposition like the one under investigation     </li> <li>         \infty Several major players with strong competencies, infrastructure and offerings     </li> </ul>					
"Market" -	Please make a list of the competitors working in the same field (e.g. the manufacturers /					
Competitors	providers of the alternative solutions previously mentioned + others)					
	No compatitacy was identified at this store					
	No competitors were identified at this stage.					
Go to Market						
Go to Market - Business						
Go to Market - Business model	examples of business models, please refer to the last pages of this document.					
- Business	examples of business models, please refer to the last pages of this document.  Business Model Scarcely applicable Applicable Very well applicable					
- Business	examples of business models, please refer to the last pages of this document.  Business Model Scarcely applicable Applicable Very well applicable  Subscription model X					
- Business	examples of business models, please refer to the last pages of this document.  Business Model Scarcely applicable Applicable  Subscription model X  Freemium model X					
- Business	examples of business models, please refer to the last pages of this document.  Business Model Scarcely applicable Applicable  Subscription model X  Freemium model X  ESCO - energy performance					
- Business	examples of business models, please refer to the last pages of this document.    Business Model   Scarcely applicable   Applicable   Very well applicable					
- Business	examples of business models, please refer to the last pages of this document.  Business Model Scarcely applicable Applicable  Subscription model X  Freemium model X  ESCO - energy performance contract  ESCO - energy supply contract					
- Business	examples of business models, please refer to the last pages of this document.  Business Model Scarcely applicable Applicable  Subscription model X  Freemium model X  ESCO - energy performance contract  ESCO - energy supply					





	Peer-to-peer model	X					
	Hidden revenue model	X					
	Direct sales model	X					
	Data licensing model		X				
	Pay as go model		X				
	Software as a service		X				
	Product as a service	X					
Go to Market	Please make an initial high-le	vel description of the	actions to be perform	ed after the end of the			
- Timing	project, to make the solution		(ATTENTION! The det	ailed list of actions will			
	be managed in the Exploitation						
	<ul> <li>During the first month</li> </ul>						
	<ol> <li>Develop a prototype ready for commercial customers.</li> <li>Disseminate the software through conferences, research papers, and online</li> </ol>						
	2. Disseminate platforms	the software through	n conferences, resear	ch papers, and online			
	platforms   Within 6 months after	the project:					
			adonters (academia ar	nd industry) and refine			
	features base		adopters (dedderriid di	id madstry, and remie			
			nts, industry partnershi	ps) for further software			
	development	t. (5		. ,			
		earch to identify the init	ial group of target clier	nts for the platform.			
	□ <u>Within 12 months</u> afte						
			e software, incorporat	ing user feedback and			
	additional fea 2. Establish coll		with academia and or	ompanies from industry			
		using or further develo		impanies irom industry			
	☐ Within 24 months after		ping the tool.				
	· · · · · · · · · · · · · · · · · · ·	stry adoption through I	icensing agreements o	r consulting services.			
				to sustain development.			
	3. Define a long	g-term roadmap for fu	iture improvements, s	calability, and potential			
	spin-off proje	ects.					
Go to Market	Please check <b>if there is any typ</b>						
- IPR	and that helped the developm		or definition and exam	ples of IP instruments,			
Background	please refer to the last pages of	this document.	0				
	<b>Type</b> Patent		Owner				
	Trade secret						
	Copyright						
	Trademark						
Go to Market	Please check if the developed	solution (within the	end of the project) co	uld be protected with			
- IPR	one (or more) type of Intellect		cha of the project) to	aia se protectea With			
Foreground	Type		Owners				
, <b>.</b>	Patent						
	Trade secret						
	Copyright						
	Trademark						





# 5.2 KER 2: Autonomous Building Digital Twin

# 5.2.1 KER 2 Characterization Table

**Table 5. KER 2 - Characterization Table** 

Name of the k	KER: Autonomous Building Digital Twin
	ners: CERTH,UniGe,CEA,R2M,IES
KER Leader(s)	: CERTH
Problem	Is this:
/need	<ul> <li>         □A technical need. Please detail (e.g. higher performance, longer duration, different features, different standards) - The Autonomous Building Digital Twin (ABDT) includes advanced building digital twinning and forecasting features, allowing model-based decision-making and support services, leveraging state-of-the-art technology, reinforcement learning (RL) methods, model predictive control (MPC), and data-driven algorithms to optimize building energy management and operations to provide services to the grid.     </li> </ul>
	<ul> <li>         □A financial/cost need. Please detail (e.g. lower CAPEX or OPEX, lower price, faster return on investment) - The ABDT aims to reduce operational costs and improve economic viability by enabling proactive demand planning, optimizing energy performance, and providing tools for investment planning and cost-benefit analysis (CAPEX). Moreover, ABDT enables energy efficiency and flexibility management (OPEX) according to tariffs.     </li> </ul>
	<ul> <li>         □A sustainability need. Please detail (e.g. lower consumption, lower level of pollutants, different social impact) - The ABDT focuses on enhancing energy efficiency, reducing greenhouse gas (GHG) emissions, and improving overall environmental impact. It supports the integration of renewable energy sources (RES), optimal energy management, and predictive maintenance to ensure sustainable building operations.     </li> <li>         ■All of them     </li> </ul>
	Geographical level:
	• ■European
	Does the need come from:
	Private customers
	Business/industrial customers (e.g., building managers, owners, and energy market players seeking optimized energy management and cost savings)
	Public entities (e.g., utilities and grid operators interested in efficient energy management
	and integration with grid services)
Description	What is the nature of the KER?
	New service (except consulting services) - The ABDT provides new services like proactive
	demand planning, continuous energy performance management, and building
	investment planning assistance.
	Please provide a description of the KER.  The Autonomous Building Digital Twin (ABDT) is an advanced, data-driven solution designed to optimize energy management and decision-making processes for buildings and districts. Leveraging state-of-the-art technologies, reinforcement learning (RL) methods, multi-timescale model predictive control (MPC), and ensemble decision trees, the ABDT aims to enhance energy efficiency, reduce operational costs, and support sustainable practices.
	Koy footures of the ARRT include:
	<ul> <li>Key features of the ABDT include:</li> <li>Proactive Demand Planning Service: Utilizes novel episodic RL methods and cost-benefit matrices to reshape day-ahead energy demand, achieving energy cost savings without compromising efficiency.</li> </ul>
	<ul> <li>Continuous Energy Performance Manager: Optimizes building systems and operations to ensure user comfort and energy efficiency through black-box policy optimization, multi- timescale MPC, and decision-tree models.</li> </ul>
	<ul> <li>Building Investment Planning Assistant: Assesses energy and environmental impacts of investments, focusing on economic benefits and viability, using the VERIFY platform and SRI advisor.</li> </ul>
	<ul> <li>Enhanced Building Situation Assessment and Forecasting: Develop a comprehensive set of tools for detailed assessment and forecasting of building conditions using a simulation engine calibrated with real-time sensory and static BIM data.</li> </ul>
	<ul> <li>Implementation of Specialized Forecasting and Maintenance Services: Integrate black-box (data-driven) and white-box (analytic) models to provide specialized services such as microgrid maintenance, indoor air quality assessment, thermal and electricity flexibility forecasting, and local energy consumption and generation forecasting.</li> </ul>





 Creation of a Multi-dimensional Digital Building Awareness Toolbox: Establish a sophisticated digital toolbox with an advanced web GUI to assess multiple building vectors and features, serving as a virtual testbed for validating various control scenarios.

The ABDT coordinates building infrastructure, smart devices, and energy management systems to reveal financial opportunities and manage energy flows efficiently. It also supports both short-term operational decisions and long-term strategic planning, addressing grid reinforcement, smart readiness, and predictive maintenance. By enabling seamless interoperability among various systems and stakeholders, the ABDT fosters a collaborative environment for effective energy management and innovation in the building sector.

#### What is the level of innovation?

Tery innovative - The ABDT introduces novel approaches to energy management, decision-making, and optimization within buildings and districts, offering significant advantages in terms of energy efficiency, cost savings, and sustainability. Its integration of cutting-edge techniques and technologies demonstrates a high level of innovation that is likely to be easily appreciated by customers seeking advanced solutions for building energy management.)

# Alternative solution

#### Probably, there's already one (or several) solution to the problem available in the market, but:

- ■It doesn't solve the full problem
- It is not commercially mature

Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.

A. Siemens - Link: Desigo CC Energy Management (siemens.com)

B. ABB - Link: <u>Building Energy Management Systems - Smart Building | Intelligent Building Management System | ABB</u>

C. Intesis - Link: <u>Building Energy Management System | BEMS | Intesis</u>

#### Can you find a main drawback or a limitation for each of the alternative solutions you provided?

- A. They are based on less elaborate simulation models (not digital twins).
- B. The control and decision making mechanisms' structures consider less elaborate ruleengines, PID or linear schemes.

Has your company (or someone in the consortium) already developed a solution for the identified need before this project started?

Yes

Can we say that this solution is the starting point of the current project development activities?

■Yes

#### If "Yes" then please specify the product or service already developed ("the starting point").

The IS tools comprising ABDT (considered under Task 4.1 and Task 4.2) have already been developed and validated in previous projects (or in the market). Their average starting TRL was already 5 at the beginning of the project.

Let's compare the KER with what we already had in the consortium. What are the main advancements respect to the "starting point" (the initial solution available in the consortium)? If possible, please give numerical figures that can quantify advancements.

- Improved flexibility for diverse applications
- Improved technical performances (please specify)
  - Reduction in energy consumption through proactive demand planning and continuous energy performance management.
  - b. Increase in energy cost savings without compromising energy efficiency.
  - c. Enhancement in building operations efficiency through optimized control strategies.
- New features
  - Introduction of advanced decision-making algorithms and methodologies such as reinforcement learning and model predictive control.
  - b. Development of novel services for proactive demand planning, continuous energy performance management, and building investment planning assistance.
- Improved customizability
- Improved user friendliness
- Improved connectivity
  - Integration of diverse building systems and operations for seamless data exchange and communication.
  - Enhanced interoperability among different stakeholders and systems for efficient energy management.
- Remote operability
  - a. Considering cloud deployment for different IS constituting ABDT
- Improved interoperability
  - a. Leveraging WP3 platform and T4.6 broker





	Let's make some comparison with the benchmark. What are the main advancements respect to the alternative solutions (A, B, C, D) you have previously identified? If possible, please give numerical figures that can quantify advancements.  Alternative solution A  Improved technical performances (please specify) Improved customizability Improved user friendliness Improved connectivity Remote operability Improved interoperability  Alternative solution B  Improved technical performances (please specify) Improved customizability Improved user friendliness Improved connectivity
	<ul> <li>Remote operability</li> <li>Improved interoperability</li> </ul>
	Alternative solution C
	Improved technical performances (please specify)
	Improved customizability     Improved user friendliness
	Improved user friendliness     Improved connectivity
	Improved connectivity     Remote operability
	Improved interoperability
"Market" –	Who are the potential early customers for this KER? Please make sure they reflect your choices
Early Adopters	in the Need/Problem section (e.g. type of customer, geography)
	Who are the potential final users?
	<ul> <li>Individuals</li> <li>Industry:         <ul> <li>One or several managers</li> <li>One specific technical profile</li> <li>One specific department/team</li> </ul> </li> <li>Industry:         <ul> <li>One specific department/team</li> </ul> </li> </ul>
	For the private company/companies, will this innovation be used by mainly current or new
	<ul> <li>customers?</li> <li>Current customers - The innovation may primarily be used by current customers if the company's existing clients have expressed interest in advanced energy management solutions or if the company aims to enhance its offerings to retain and expand its</li> </ul>
	<ul> <li>customer base.</li> <li>New customers - The innovation could also attract new customers if the company plans to market the Autonomous Building Digital Twin (ABDT) to potential clients who are seeking innovative solutions for energy optimization and sustainability in buildings.</li> </ul>
Value	Let's see what's relevant for the KER under investigation:
proposition – Customer profile	What are the activities (Customer jobs) the customer usually performs, where our KER would be needed?
	<ol> <li>Real-time Energy Monitoring: The customer regularly monitors energy consumption patterns and identifies areas for improvement in energy efficiency based on the capacity of the elaborate Digital Twin framework.</li> <li>Occupancy Optimization: The customer adjusts building settings and resources based on occupancy patterns to optimize energy usage and occupant comfort.</li> <li>Predictive Maintenance Planning: The customer plans maintenance activities based on predictive analytics and real-time monitoring data to prevent equipment failures and</li> </ol>
	predictive analytics and real-time monitoring data to prevent equipment failures and optimize maintenance schedules.





	<ol> <li>Demand Response Management: The customer participates in demand response programs and manages energy demand in real-time to reduce costs and support grid stability.</li> </ol>
	What are the pains the customer encounters while doing the previous activities? N/A
	What are the gains the customer aims at, while doing the previous activities?
	1. Cost Reduction: The customer aims to reduce energy bills and operating expenses by
	optimizing energy consumption and costs (OPEX).  2. Optimized Comfort and Conditions: The customer seeks to maintain optimal comfort parameters within the building while aligning with outside conditions, ensuring a comfortable and productive environment for occupants.
	<ol> <li>Environmental Sustainability: The customer has environmental targets to achieve, such as reducing carbon emissions, conserving natural resources, and minimizing the ecological footprint of building operations through smart investment planning (CAPEX).</li> <li>Operational Efficiency: The customer aims to improve operational efficiency by streamlining energy management processes, reducing downtime, and enhancing overall productivity.</li> </ol>
Value	CUSTOMER JOBS:
proposition	Please confirm in which customer activity/process the KER can be integrated and how much it
	is relevant (refer to the activities identified in the previous section):
	<ul> <li>Activity 1: How much is the KER crucial to perform the activity?</li> <li>Indispensable</li> </ul>
	Activity 2: How much is the KER crucial to perform the activity?
	• • Indispensable
	Activity 3 How much is the KER crucial to perform the activity?
	<ul> <li>Indispensable</li> <li>Activity 4: How much is the KER crucial to perform the activity?</li> </ul>
	Indispensable
	CUSTOMER GAINS:
	What are the gains – among those previously listed – the KER can help achieving (refer to the gains identified in the previous section)?
	1. Cost Reduction: The customer aims to reduce energy bills and operating expenses by
	optimizing energy consumption and costs (OPEX).  2. Optimized Comfort and Conditions: The customer seeks to maintain optimal comfort parameters within the building while aligning with outside conditions, ensuring a
	comfortable and productive environment for occupants.  3. Environmental Sustainability: The customer has environmental targets to achieve, such as reducing carbon emissions, conserving natural resources, and minimizing the ecological
	footprint of building operations through smart investment planning (CAPEX).  4. Operational Efficiency: The customer aims to improve operational efficiency by streamlining energy management processes, reducing downtime, and enhancing overall productivity.
"Market" –	What is the primary target market?
Target market	Real estate management
market	Please specify the most relevant sub-sector(s) of the KER, within the selected market:
	Commercial real estate
	<ul> <li>Residential real estate</li> <li>Facility management services</li> </ul>
	• Facility management services
	The market targeted by this innovation is:
	■Emerging: There is a growing demand and few offerings are available
	Market dynamics: is the market?
	• <b>■</b> Growing
	Are there other markets for this innovation that the innovators are not yet targeting?
	• <b>T</b> Yes
	Market competition: How strong is competition in the target market?
	The strong is competition in the target market?     Established competition but none with a proposition like the one under investigation
"Market" -	Please make a list of the competitors working in the same field (e.g. the manufacturers /
Competitors	providers of the alternative solutions previously mentioned + others)
	□ <u>SMEs</u> : 1. Rething IoT
	2. Energenius SRL
	3. Econerg SRL
	☐ <u>Large enterprises</u> :





	1. SIEMENS			
	2 ABB			
	3. Intesys			
	4. Evon			
Go to Market	What are the relevant Busin	ess models and how mi	uch are they applical	ole. For definition an
- Business	examples of business models			
model	Business Model	Scarcely applicable	Applicable	Very well applicable
	Subscription model			
	ESCO – energy performance			
	contract			
	Software as a service			
Go to Market – Timing	Please make an initial high-le project, to make the solution be managed in the Exploitati Within 12 months aft	ready to market – TRL9( ion Checklist):		
	l. EC certificat			
	2. ISO 50001 ce			
		e establishment		
Go to Market	Please check <b>if there is any</b>	type of Intellectual pro	operty already secur	ed (before the projec
- IPR	started) and that helped the			
Background	instruments, please refer to th	e last pages of this docun	nent.	'
	Type		Owner	
	Patent			
	Trade secret			
	Copyright	CERTH, UniGe, CEA, R2I	M, IES	
	Trademark			
Go to Market - IPR	Please check if the develope one (or more) type of Intellect		nd of the project) co	uld be protected wit
Foreground	Туре		Owners	
	Patent			
	Trade secret			
	Copyright	CERTH, UniGe, CEA, R21	M, IES	
	Trademark			





# 5.3 KER 3: Autonomous District Digital Twin

# 5.3.1 KER 3 Characterization Table

**Table 6. KER 3 - Characterization Table** 

Name of the K	ER: Autonomous District Digital Twin (ADDT)
Involved partn	ers: UBE, IES, CERTH
KER Leader(s):	UBE
Problem	Is this:
/need	<ul> <li>□A technical need. Please detail (e.g. higher performance, longer duration, different</li> </ul>
	features, different standards) - Electrical grid resilience
	• 🔲 A financial/cost need. Please detail (e.g. lower CAPEX or OPEX, lower price, faster return
	on investment) - Energy cost savings
	•   A sustainability need. Please detail (e.g. lower consumption, lower level of pollutants,
	different social impact) - <b>RES maximization</b> ■ ☑All of them
	Geographical level:
	Scientification     Scientification
	Does the need come from:
	Business/industrial customers
	Public entities
Description	What is the nature of the KER?
Description.	
	Please provide a description of the KER.
	ADDT extends the BAUNs vision to districts and aims to optimize energy management at a district
	scale. Addressing diverse energy goals, it optimizes inter-building energy exchanges and enables
	automated decision-making for holistic system planning, operation, and maintenance across
	building and grid levels.
	What is the level of innovation?
	Innovative but could be difficult to convert customers
Alternative	Probably, there's already one (or several) solution to the problem available in the market, but:
solution	It is difficult to implement
	It is expensive
	Can you make a list of 3/4 products (or services) already available in the market that are trying
	to solve the same need as this KER? If possible, please provide a link to a reference website for further information.
	1. OPAL RT Digital Twins - Link: https://www.opal-rt.com/digital-twins/
	2. ALTAIR - Link: https://altair.com/one-total-twin
	3. ANSYS Twin Builder - Link: https://www.ansys.com/products/digital-twin/ansys-twin-builder
	Can you find a main drawback or a limitation for each of the alternative solutions you provided?  1. Expensive, Generic-Complicated to implement
	2. Expensive, Generic-Complicated to implement
	3. Expensive, Generic-Complicated to implement
	Has your company (or someone in the consortium) already developed a solution for the
	identified need before this project started?
	•   Yes  Common the state of th
	Can we say that this solution is the starting point of the current project development activities?
	• ⊠Yes  If "Yes" then please specify the product or service already developed ("the starting point").
	IES iVN - https://www.iesve.com/products/ivn
	Let's compare the KER with what we already had in the consortium. What are the main
	advancements respect to the "starting point" (the initial solution available in the consortium)?
	If possible, please give numerical figures that can quantify advancements.
	Improved flexibility for diverse applications
	New features
	Improved interoperability
	Let's make some comparison with the benchmark. What are the main advancements respect
	to the alternative solutions (A, B, C, D) you have previously identified? If possible, please give
	numerical figures that can quantify advancements.
	Alternative solution A
	Improved user friendliness
	⊠Remote operability
	Alternative solution B





	Improved user friendliness
	⊠Remote operability
	Alternative solution C
	Improved user friendliness  Monate an area bility.
"Market" –	MRemote operability  Who are the potential early customers for this KER? Please make sure they reflect your choices
Early	in the Need/Problem section (e.g. type of customer, geography)
Adopters	Sassociations of individuals
	⊠Private Large enterprises
	⊠Public bodies / authorities
	Please name a few potential customers:
	1. Greek DSO (DEDDIE)
	2. UKPN DSO (UK)
	Who are the potential final users?
	Industry:
	o ⊠One specific department/team
	⊠Public bodies / authorities
	o ⊠One specific department/team
	For the contract of the contra
	For the private company/companies, will this innovation be used by mainly current or new customers?
	New customers
Value	Let's see what's relevant for the KER under investigation:
proposition -	Let's see what's relevant for the KEK arider investigation.
Customer	What are the activities (Customer jobs) the customer usually performs, where our KER would
profile	be needed?
	<ol> <li>Evaluation of DSO energy/flexibility products and scenario testing</li> </ol>
	Evaluation of aggregators services and scenario testing
	What are the pains the customer encounters while doing the previous activities?
	1. The customer does not have a tool for multi energy carrier networks optimization.
	2. The customer may not have the technical expertise to use a more complicated software
	tool.
	<ol> <li>The customer may not be able to interpret the results and extract useful recommendation on their own (e.g., from raw data).</li> </ol>
	What are the gains the customer aims at, while doing the previous activities?
	The customer wants to have user friendly results.
	2. The customer wants to reduce energy supply costs.
Value	CUSTOMER JOBS:
proposition	Please confirm in which customer activity/process the KER can be integrated and how much it
	is relevant (refer to the activities identified in the previous section):
	Activity 1: How much is the KER crucial to perform the activity?
	Score, but needs to work in synergy with other components/processes  Astirity of Hayy much is the VSB graving to mark yet the participation.
	Activity 2: How much is the KER crucial to perform the activity?      Nice to have
	■ Mice to have     Activity 3: ☑ The KER can be integrated □ The KER cannot be integrated How much is the
	KER crucial to perform the activity?
	Nice to have
	CUSTOMER PAINS:
	What are the pains – among those previously listed – the KER can help reducing or avoiding
	(refer to the pains identified in the previous section)?
	1. Environmental targets. How? Optimal management
	2. Electricity Costs. How? Optimal management
	CUSTOMER GAINS:
	What are the gains – among those previously listed – the KER can help achieving (refer to the
	gains identified in the previous section)?
	Environmental targets How? Optimal management     Fleetricity Costs     How? Optimal management
	2. Electricity Costs How? Optimal management
"Market" –	What is the primary target market?
Target	⊠Energy production/distribution/consumption
market	
	Please specify the most relevant sub-sector(s) of the KER, within the selected market:
	Energy markets
	The market targeted by this innovation is:
	i ilie iliginet taiveteu DV tillä IIIIIOVALIOII 13.





		yet existing but the in	novation has clear pote	ential to create a new
	market			
	<u>, , , , , , , , , , , , , , , , , , ,</u>			
	Market dynamics: is the mark	cet?		
	⊠ Growing			
	Are there other markets for t	his innovation that the	innovators are not ve	t targeting?
	No	ins innovation that the	e illilovators are riot ye	t targeting.
	2 2110			
	Market competition: How str	ong is competition in t	the target market?	
	-		encies, infrastructure an	nd offerings
"Market" -	Please make a list of the co	ompetitors working in	n the same field (e.g.	the manufacturers /
Competitors	providers of the alternative s	olutions previously me	entioned + others)	
	Large enterprises:			
	1. ANSYS			
	2. ALTAIR			
0	3. OPAL RT			
Go to Market  – Business	What are the relevant Busine examples of business models			
model		Scarcely		Very well
model	Business Model	applicable	Applicable	applicable
	Subscription model		✓	
	Bundling model		✓	
	Direct sales model		✓	
	Consulting model		✓	
	Software as a service		✓	
Go to Market -	Please make an initial high-le	evel description of the	actions to be performe	d after the end of the
Go to Market - Timing	Please make an initial high-le project, to make the solution will be managed in the Explo  During the first mont  1. Develop the	n ready to market - TR itation Checklist): h after the project:		etailed list of actions
	project, to make the solution will be managed in the Explo  During the first mont  1. Develop the Within 6 months afte	n ready to market - TR itation Checklist): h after the project: software to full-scale, in r the project:	ncorporating all features	etailed list of actions s and functionality.
	project, to make the solution will be managed in the Explo  During the first mont  Develop the Within 6 months afte  I. Ensure the s	n ready to market - TR itation Checklist): h after the project: software to full-scale, in r the project: oftware meets all perfo	L9 (ATTENTION! The d	etailed list of actions s and functionality.
	project, to make the solution will be managed in the Explo  During the first mont  Develop the Within 6 months afte  Ensure the s Within 12 months afte	n ready to market - TR itation Checklist): h after the project: software to full-scale, in r the project: oftware meets all performs er the project:	ncorporating all features	etailed list of actions s and functionality. sability standards.
	project, to make the solution will be managed in the Explo  During the first mont  Develop the Within 6 months afte  Ensure the s  Within 12 months afte  Integrate the	n ready to market - TR itation Checklist): h after the project: software to full-scale, in r the project: software meets all perform er the project: e software with all inten	ncorporating all features	etailed list of actions s and functionality. sability standards.
	project, to make the solution will be managed in the Explo  During the first mont  Develop the Within 6 months afte  Ensure the s Within 12 months afte  United the within 24 months afte	n ready to market - TR itation Checklist): h after the project: software to full-scale, in r the project: software meets all perform er the project: e software with all intenter er the project:	ncorporating all features rmance, security, and u	etailed list of actions s and functionality. sability standards. r system components.
	project, to make the solution will be managed in the Explo  During the first mont  Develop the Within 6 months afte Ensure the s Within 12 months afte Integrate the Within 24 months aft Ensure the s	n ready to market - TR itation Checklist): h after the project: software to full-scale, in r the project: software meets all perfore er the project: e software with all inten- er the project: oftware operates as inte	ncorporating all features rmance, security, and u ded hardware and othe	etailed list of actions s and functionality. sability standards. r system components.
	project, to make the solution will be managed in the Explo  During the first mont  Develop the Within 6 months afte Ensure the s Within 12 months afte Integrate the Within 24 months aft Ensure the s issues identi	n ready to market - TR itation Checklist): h after the project: software to full-scale, in r the project: oftware meets all perfo- er the project: e software with all inten- er the project: oftware operates as inte- fied during previous tes	ncorporating all features rmance, security, and u ded hardware and othe ended in real-world cond sting phases.	etailed list of actions s and functionality. sability standards. r system components. ditions, addressing any
Timing	project, to make the solution will be managed in the Explo  During the first mont  Develop the Within 6 months afte Ensure the s Within 12 months afte Integrate the Within 24 months aft Ensure the s	n ready to market - TR itation Checklist): h after the project: software to full-scale, in r the project: oftware meets all perform er the project: e software with all inten- er the project: oftware operates as inte- fied during previous tes- type of Intellectual p	ncorporating all features rmance, security, and unded hardware and other ended in real-world conditing phases.	etailed list of actions s and functionality. sability standards. r system components. ditions, addressing any
Timing  Go to Market	project, to make the solution will be managed in the Explo  During the first mont  Develop the Within 6 months afte Ensure the s Within 12 months afte Integrate the Within 24 months aft Ensure the s issues identi  Please check if there is any	n ready to market - TRitation Checklist): h after the project: software to full-scale, in r the project: oftware meets all performs er the project: e software with all inten- er the project: oftware operates as inte fied during previous tes type of Intellectual p	ncorporating all features rmance, security, and unded hardware and othe ended in real-world conditing phases. roperty already secures solution. For definition	etailed list of actions s and functionality. sability standards. r system components. ditions, addressing any
Go to Market	project, to make the solution will be managed in the Explo  During the first mont  Develop the  Within 6 months afte  Ensure the s  Within 12 months afte  Integrate the  Within 24 months aft  Ensure the s  issues identi  Please check if there is any started) and that helped the	n ready to market - TRitation Checklist): h after the project: software to full-scale, in r the project: oftware meets all performs er the project: e software with all inten- er the project: oftware operates as inte fied during previous tes type of Intellectual p	ncorporating all features rmance, security, and unded hardware and othe ended in real-world conditing phases. roperty already secures solution. For definition	etailed list of actions s and functionality. sability standards. r system components. ditions, addressing any
Go to Market	project, to make the solution will be managed in the Explo  During the first mont  Develop the  Within 6 months afte  Ensure the s  Within 12 months afte  Integrate the Within 24 months aft  Ensure the s issues identi  Please check if there is any started) and that helped the instruments, please refer to the Type Patent	n ready to market - TRitation Checklist): h after the project: software to full-scale, in r the project: oftware meets all performs er the project: e software with all inten- er the project: oftware operates as inte fied during previous tes type of Intellectual p	ncorporating all features rmance, security, and unded hardware and othe ended in real-world conditing phases. roperty already secures solution. For definition	etailed list of actions s and functionality. sability standards. r system components. ditions, addressing any
Go to Market	project, to make the solution will be managed in the Explo  During the first mont  Develop the  Within 6 months afte  Ensure the s  Within 12 months afte  Integrate the Within 24 months aft  Ensure the s issues identi  Please check if there is any started) and that helped the instruments, please refer to the Type  Patent  Trade secret	n ready to market - TRitation Checklist): h after the project: software to full-scale, in r the project: oftware meets all performs er the project: e software with all inten- er the project: oftware operates as inte fied during previous tes type of Intellectual p	ncorporating all features rmance, security, and unded hardware and othe ended in real-world conditing phases. roperty already secures solution. For definition	etailed list of actions s and functionality. sability standards. r system components. ditions, addressing any
Go to Market	project, to make the solution will be managed in the Explo  During the first mont  Develop the  Within 6 months afte  Ensure the s  Within 12 months afte  Within 24 months aft  Ensure the s  issues identi  Please check if there is any started) and that helped the instruments, please refer to the Type  Patent  Trade secret  Copyright	n ready to market - TRitation Checklist): h after the project: software to full-scale, in r the project: oftware meets all performs er the project: e software with all inten- er the project: oftware operates as inte fied during previous tes type of Intellectual p	ncorporating all features rmance, security, and u ded hardware and othe ended in real-world cond sting phases. roperty already secure solution. For definition ument. Owner	etailed list of actions s and functionality. sability standards. r system components. ditions, addressing any
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# **5.4 KER 5: Interoperability and Abstraction Services**

# 5.4.1 KER 5 Characterization Table

**Table 7. KER 5 - Characterization Table** 

Name of the K	ER: Energy services Marketplace (IS18)
	ners: CIRCE and CERTH
KER Leader(s):	CIRCE
Problem /need	Is this:  •   •   •   •   •   •   •   •   •   •
	Geographical level:
	⊠European
	Does the need come from:
	MPrivate customers
	MBusiness/industrial customers
	⊠Public entities
Description	What is the nature of the KER?
	<ul> <li>New service (except consulting services) - Although Marketplaces already exist as such,</li> </ul>
	it is a new way of selling energy services.
'	Please provide a description of the KER.
	Establishing a marketplace for exchanging and sharing BDT and DDT services, enabling seamless subscription schemes, through four main components: data management, subscription management, data upload management and metadata exploration component.  The innovation of the proposed solution is based on providing highly personalized experiences of
	available EVELIXIA list of services offered, for relevant stakeholders, through the usage of a blockchain-based peer-to-peer energy marketplace.  The innovation will focus on not only allowing the testing of all the functionalities implemented inside the interoperability and abstraction services layer, but also allow the exploration of available data and
	metadata (datasets, ML pretrained models, results).  What is the level of innovation?
	Solviously innovative and easily appreciated advantages to customers.
Alternative	Probably, there's already one (or several) solution to the problem available in the market, but:
solution	• MIt is expensive.
	Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.
	No alternative solution was identified at this stage.
	Has your company (or someone in the consortium) already developed a solution for the identified need before this project started?  • 🖾 No  Can we say that this solution is the starting point of the current project development activities?
	• No
"Market" – Early	Who are the potential early customers for this KER? Please make sure they reflect your choices in the Need/Problem section (e.g. type of customer, geography)
Adopters	<ul> <li>⊠Private Small or medium enterprises</li> <li>⊠Private Large enterprises</li> </ul>
	Please name a few potential customers:  1. DSOs 2. TSOs
	Who are the potential final users?  • ⊠Industry:  • ⊠One or several managers  • ⊠One specific department/team  • ⊠Individuals  • ⊠Non-profit organizations
	o ⊠One or several managers o ⊠One specific department/team o ⊠Individuals





	o ⊠One or several managers o ⊠Individuals
	MIndividuals     MResearch and academic bodies
	o ⊠One or several managers o ⊠One specific department/team
	For the private company/companies, will this innovation be used by mainly current or new
	customers?
	\alpha \times Current customers
Value	What are the activities (Customer jobs) the customer usually performs, where our KER would be
proposition -	needed?
Customer	<ul> <li>DSOs have to make seasonal adjustments of settings in energy management.</li> </ul>
profile	<ul> <li>Building tenants and managers check the energy consumption of all the residents</li> </ul>
	regularly.
	<ul> <li>Building tenants and managers manage the self-consumption of the buildings.</li> </ul>
	What are the pains the customer encounters while doing the previous activities?
	1. Too much information to navigate through.
	<ol><li>Not all the solutions that customers want or are looking for are available now. High costs of</li></ol>
	some particular services.
	What are the gains the customer aims at, while doing the previous activities?
	Information presented in a friendly, clear, and precise manner.
	2. Ability to test all the functionalities of the marketplace.
	3. Seamless subscription schemes.
Value	CUSTOMER JOBS:
proposition	Please confirm in which customer activity/process the KER can be integrated and how much it
	is relevant (refer to the activities identified in the previous section):
	Activity 1: How much is the KER crucial to perform the activity?
	Score, but needs to work in synergy with other components/processes  Astinity 2 Llow much is the VCD graphet to perform the actinity 2.
	Activity 2: How much is the KER crucial to perform the activity?      Secondary models to work in a green with at her construction and the construction of the construction of the construction.
	<ul> <li></li></ul>
	Mactivity 5. How much is the KER crucial to perform the activity?      Mactivity 5. How much is the KER crucial to perform the activity?      Mactivity 5. How much is the KER crucial to perform the activity?
	CUSTOMER PAINS:
	What are the pains – among those previously listed – the KER can help reducing or avoiding
	(refer to the pains identified in the previous section)?
	Too much information to navigate through. <b>How</b> ? Smart GUI design.
	<ul> <li>Not all desired services will be available to use How? Initial approach of all services</li> </ul>
	available as long as they will land on the marketplace.
	<ul> <li>High prices of some particular services. How? Ensure fair prices according to data-</li> </ul>
	driven services quality.
	CUSTOMER GAINS:
	What are the gains – among those previously listed – the KER can help achieving (refer to the
	gains identified in the previous section)?
	<ul> <li>Information presented in a friendly, clear, and precise manner. How? Better insights</li> </ul>
	and user experience.
	Ability to test all the functionalities of the marketplace. <b>How</b> ? By using the PoC/MVP  Appropriate the approximate of the state of the marketplace. How? By using the PoC/MVP  Approximately the state of the
	<ul> <li>approach, according to efforts distribution.</li> <li>Seamless subscription schemes. <b>How</b>? Easy interaction between data-driven energy</li> </ul>
	services.
"Market" –	What is the primary target market?
Target	⊠Energy production/distribution/consumption
market	
	Please specify the most relevant sub-sector(s) of the KER, within the selected market:
	DSOs, Aggregators, buildings managers.
	The market targeted by this innovation is:
	Emerging: There is a growing demand, and few offerings are available.
	= Errorging. There is a growing definiting, and rew orientings are available.
	Market dynamics: is the market?
	• 🗵 Growing
	Are there other markets for this innovation that the innovators are not yet targeting?
	• ⊠ No
	Market competition: How strong is competition in the target market?





	⊠ Established co	ompetition but non	e with a proposition	on like the one und	er investigation.
"Market" - Competitors	Please make a list of t providers of the alternat No competitors were ide	tive solutions previntified at this stage	iously mentioned	+ others)	
Go to Market - Business	What are the relevant E examples of business m				
model	Business Model	Not applicable	Scarcely applicable	Applicable	Very well applicable
	Subscription model				X
	Software as a service				X
Go to Market - Timing  Go to Market - IPR Background	Please make an initial hiproject, to make the solube managed in the Explication is to explication is to explication with the develoon. This will be done after the depend on the type of propersion of the type of propersion and that helpe instruments, please refer	ution ready to marioitation Checklist) ploit this solution in pment and improve project ends, is dif- oject.  any type of Intel d the developmer	ket - TRL9 (ATTEN:  iternally and look to the the features so to fficult to estimate of the top the solution	for further private o o offer a better solu concrete amount o already secured (	I list of actions will or public projects to ition to the market. If time as it will (before the project
	Туре		Ow	ner	
	Patent Trade secret				
	Copyright				
	Trademark				
Go to Market - IPR	Please check if the deve one (or more) type of Int			the project) could	be protected with
Foreground	Туре		Owi	ners	
	Patent Trade secret				
	Copyright				
	Trademark				





# 5.5 KER 6: Geothermal Wall System

# 5.5.1 KER 6 Characterization Table

**Table 8. KER 6 - Characterization Table** 

Name of the K	(ER: Geothermal Wall System – (IS24) (HW)
Involved partr	ners: TUCN
KER Leader(s)	TUCN
Problem	Is this:
/need	SA sustainability need. Please detail (e.g. lower consumption, lower level of pollutants,
,	different social impact)
	Geographical level:
	SLocal /national
	· · · · · · · · · · · · · · · · · · ·
	Does the need come from:
	■ Other (please specify) – CO <sub>2</sub> emissions reduction
Description	What is the nature of the KER?
	New product
	Please provide a description of the KER.
	Part of the underground wall of the dorm facing South Façade will be thermally activated.
	- Special layering and system will be developed, focusing on both structural and architectural
	"health" of the wall that will include a pipe system.
	- FOCUS on the scalability and optimization of the system
	<ul> <li>Two type of pipe layout on the exterior of the wall to compare the influence of pipe</li> </ul>
	layout, in order to transform the wall into an energy wall
	<ul> <li>Development of an interior GeoWall system, which consists of prefabricated modular</li> </ul>
	panels that are designed to be easily installed on the interior walls of underground
	spaces such as basements. The GeoWall system is engineered to ensure the thermal
	insulation of these spaces while simultaneously capturing and repurposing waste
	heat that is typically lost in conventional underground environments.
	- Heat pump system connected
	Distribution system to be installed in some of the Dorm Rooms ( 3 rooms)
	What is the level of innovation?
	Innovative but could be difficult to convert customers
Alternative	Probably, there's already one (or several) solution to the problem available in the market, but:
solution	Slt is difficult to implement
Solution	· ·
	Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for
	further information.
	Energy geostructures - Link: <a href="https://greentags.ro/en/about-energy-geotructures/">https://greentags.ro/en/about-energy-geotructures/</a>
	Energy geostructures - Link: <a href="https://greentags.ro/en/about-energy-geotructures/">https://greentags.ro/en/about-energy-geotructures/</a> Energy geostructures - Link: <a href="https://solarimpulse.com/solutions-explorer/energygeostructures">https://solarimpulse.com/solutions-explorer/energygeostructures</a>
	z. Energy geostructures - Link. <u>https://solarimpulse.com/solutions-explorer/energygeostructures</u>
	Can you find a main drawback or a limitation for each of the alternative solutions you provided?
	1. This solution can be used only for new buildings when the foundation is executed
	2. Small scale commercialization
	Has your company (or someone in the consortium) already developed a solution for the identified
	need before this project started?
	● ⊠Yes
	Can we say that this solution is the starting point of the current project development activities?
	• ⊠Yes
	If "Yes" then please specify the product or service already developed ("the starting point").
	We developed the energy geostructures, but just for the new buildings, please see the link:
	https://greentags.ro/en/about-energy-geotructures/
	Let's compare the KER with what we already had in the consortium. What are the main
	advancements respect to the "starting point" (the initial solution available in the consortium)? If
	possible, please give numerical figures that can quantify advancements.
	Improved flexibility for diverse applications
	Mimproved design, size, weight, efficiency, materials
	⊠New features
	—————————————————————————————————————
	Improved customizability
	Improved environmental impact
	Improved environmental impact  Let's make some comparison with the benchmark. What are the main advancements respect to
	l · · · · · · · · · · · · · · · · · · ·





	Alternative solution A
	Improved flexibility for diverse applications
	Improved design, size, weight, efficiency, materials
	Mew features
	Improved customizability
	Improved environmental impact
	Alternative solution B
	Improved flexibility for diverse applications
	⊠New features
	Improved customizability
"Market" -	Who are the potential early customers for this KER? Please make sure they reflect your choices
Early	in the Need/Problem section (e.g. type of customer, geography)
Adopters	<ul> <li>■Individuals</li> </ul>
	⊠Associations of individuals
	MPrivate Small or medium enterprises
	⊠Research and academic bodies
	Who are the potential final users?
	⊠Individuals
	⊠Industry:
	o 🛮 One specific technical profile
	o ⊠One specific department/team
	⊠Research and academic bodies
	o ⊠One specific technical profile
	o ⊠One specific department/team
	For the private company/companies, will this innovation be used by mainly current or new
	customers?
	⊠Current customers
	MNew customers
Value	What are the activities (Customer jobs) the customer usually performs, where our KER would be
proposition	needed?
- Customer	1. Sets the temperature set point in the room
profile	
p. 00	
promo	
p. 61.113	What are the pains the customer encounters while doing the previous activities?
promo	What are the pains the customer encounters while doing the previous activities?  1. To pay the electricity bills
promo	
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
	<ol> <li>To pay the electricity bills</li> <li>What are the gains the customer aims at, while doing the previous activities?</li> <li>The customer wants to keep comfort parameters under control, according to outside conditions</li> </ol>
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	To pay the electricity bills  What are the gains the customer aims at, while doing the previous activities?
	<ol> <li>To pay the electricity bills</li> <li>What are the gains the customer aims at, while doing the previous activities?</li> <li>The customer wants to keep comfort parameters under control, according to outside conditions</li> <li>The customer wants to reduce the CO2 emissions</li> </ol>
Value	<ol> <li>To pay the electricity bills</li> <li>What are the gains the customer aims at, while doing the previous activities?</li> <li>The customer wants to keep comfort parameters under control, according to outside conditions</li> <li>The customer wants to reduce the CO2 emissions</li> <li>CUSTOMER JOBS:</li> </ol>
	<ol> <li>To pay the electricity bills</li> <li>What are the gains the customer aims at, while doing the previous activities?</li> <li>The customer wants to keep comfort parameters under control, according to outside conditions</li> <li>The customer wants to reduce the CO2 emissions</li> <li>CUSTOMER JOBS:</li> <li>Please confirm in which customer activity/process the KER can be integrated and how much it</li> </ol>
Value	<ol> <li>To pay the electricity bills</li> <li>What are the gains the customer aims at, while doing the previous activities?</li> <li>The customer wants to keep comfort parameters under control, according to outside conditions</li> <li>The customer wants to reduce the CO2 emissions</li> <li>CUSTOMER JOBS:         Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):     </li> </ol>
Value	<ol> <li>To pay the electricity bills</li> <li>What are the gains the customer aims at, while doing the previous activities?</li> <li>The customer wants to keep comfort parameters under control, according to outside conditions</li> <li>The customer wants to reduce the CO2 emissions</li> <li>CUSTOMER JOBS:         Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):         <ul> <li>Activity 1: How much is the KER crucial to perform the activity?</li> </ul> </li> </ol>
Value	<ol> <li>To pay the electricity bills</li> <li>What are the gains the customer aims at, while doing the previous activities?</li> <li>The customer wants to keep comfort parameters under control, according to outside conditions</li> <li>The customer wants to reduce the CO2 emissions</li> <li>CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):         <ul> <li>Activity 1: How much is the KER crucial to perform the activity?</li> <li>Nice to have</li> </ul> </li> </ol>
Value	<ol> <li>To pay the electricity bills</li> <li>What are the gains the customer aims at, while doing the previous activities?</li> <li>The customer wants to keep comfort parameters under control, according to outside conditions</li> <li>The customer wants to reduce the CO2 emissions</li> <li>CUSTOMER JOBS:         Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):         Activity 1: How much is the KER crucial to perform the activity?         Mice to have     </li> <li>CUSTOMER GAINS:</li> </ol>
Value	1. To pay the electricity bills  What are the gains the customer aims at, while doing the previous activities?  1. The customer wants to keep comfort parameters under control, according to outside conditions  2. The customer wants to reduce the CO2 emissions  CUSTOMER JOBS:  Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • Nice to have  CUSTOMER GAINS:  What are the gains – among those previously listed – the KER can help achieving (refer to the
Value	1. To pay the electricity bills  What are the gains the customer aims at, while doing the previous activities?  1. The customer wants to keep comfort parameters under control, according to outside conditions  2. The customer wants to reduce the CO2 emissions  CUSTOMER JOBS:  Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • Nice to have  CUSTOMER GAINS:  What are the gains – among those previously listed – the KER can help achieving (refer to the gains identified in the previous section)?
Value	<ol> <li>To pay the electricity bills</li> <li>What are the gains the customer aims at, while doing the previous activities?</li> <li>The customer wants to keep comfort parameters under control, according to outside conditions</li> <li>The customer wants to reduce the CO2 emissions</li> <li>CUSTOMER JOBS:         <ul> <li>Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):</li></ul></li></ol>
Value proposition	<ol> <li>To pay the electricity bills</li> <li>What are the gains the customer aims at, while doing the previous activities?</li> <li>The customer wants to keep comfort parameters under control, according to outside conditions</li> <li>The customer wants to reduce the CO2 emissions</li> <li>CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):         <ul> <li>Activity 1: How much is the KER crucial to perform the activity?</li> <li>Nice to have</li> </ul> </li> <li>CUSTOMER GAINS: What are the gains – among those previously listed – the KER can help achieving (refer to the gains identified in the previous section)?</li> <li>The customer wants to reduce the CO2 emissions. How? Reduces environmental impact by up to 60% compared to gas boilers and air conditioners</li> </ol>
Value proposition	<ol> <li>To pay the electricity bills</li> <li>What are the gains the customer aims at, while doing the previous activities?</li> <li>The customer wants to keep comfort parameters under control, according to outside conditions</li> <li>The customer wants to reduce the CO2 emissions</li> <li>CUSTOMER JOBS:         Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):</li></ol>
Value proposition	<ol> <li>To pay the electricity bills</li> <li>What are the gains the customer aims at, while doing the previous activities?</li> <li>The customer wants to keep comfort parameters under control, according to outside conditions</li> <li>The customer wants to reduce the CO2 emissions</li> <li>CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):         <ul> <li>Activity 1: How much is the KER crucial to perform the activity?</li> <li>Nice to have</li> </ul> </li> <li>CUSTOMER GAINS: What are the gains – among those previously listed – the KER can help achieving (refer to the gains identified in the previous section)?</li> <li>The customer wants to reduce the CO2 emissions. How? Reduces environmental impact by up to 60% compared to gas boilers and air conditioners</li> <li>What is the primary target market?</li> <li>MReal estate management</li> </ol>
Value proposition	<ol> <li>To pay the electricity bills</li> <li>What are the gains the customer aims at, while doing the previous activities?</li> <li>The customer wants to keep comfort parameters under control, according to outside conditions</li> <li>The customer wants to reduce the CO2 emissions</li> <li>CUSTOMER JOBS:         Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):</li></ol>
Value proposition	<ol> <li>To pay the electricity bills</li> <li>What are the gains the customer aims at, while doing the previous activities?</li> <li>The customer wants to keep comfort parameters under control, according to outside conditions</li> <li>The customer wants to reduce the CO2 emissions</li> <li>CUSTOMER JOBS:         <ul> <li>Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):</li></ul></li></ol>
Value proposition	1. To pay the electricity bills  What are the gains the customer aims at, while doing the previous activities?  1. The customer wants to keep comfort parameters under control, according to outside conditions 2. The customer wants to reduce the CO2 emissions  CUSTOMER JOBS:  Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • Nice to have  CUSTOMER GAINS:  What are the gains – among those previously listed – the KER can help achieving (refer to the gains identified in the previous section)?  1. The customer wants to reduce the CO2 emissions. How? Reduces environmental impact by up to 60% compared to gas boilers and air conditioners  What is the primary target market?  • Naeal estate management  • Naeal estate management  • Naeal estate management  • Naeal estate by this innovation is:
Value proposition	<ol> <li>To pay the electricity bills</li> <li>What are the gains the customer aims at, while doing the previous activities?</li> <li>The customer wants to keep comfort parameters under control, according to outside conditions</li> <li>The customer wants to reduce the CO2 emissions</li> <li>CUSTOMER JOBS:         <ul> <li>Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):</li></ul></li></ol>
Value proposition	<ul> <li>To pay the electricity bills</li> <li>What are the gains the customer aims at, while doing the previous activities?</li> <li>The customer wants to keep comfort parameters under control, according to outside conditions</li> <li>The customer wants to reduce the CO2 emissions</li> <li>CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):         <ul> <li>Activity 1: How much is the KER crucial to perform the activity?</li> <li>Nice to have</li> </ul> </li> <li>CUSTOMER GAINS: What are the gains – among those previously listed – the KER can help achieving (refer to the gains identified in the previous section)?</li> <li>The customer wants to reduce the CO2 emissions. How? Reduces environmental impact by up to 60% compared to gas boilers and air conditioners</li> <li>What is the primary target market?         <ul> <li>Meal estate management</li> <li>Mother (please specify) Residential and tertiary existing buildings</li> </ul> </li> <li>The market targeted by this innovation is:         <ul> <li>Mean market is not yet existing but the innovation has clear potential to create a new market</li> </ul> </li> </ul>
Value proposition	<ul> <li>To pay the electricity bills</li> <li>What are the gains the customer aims at, while doing the previous activities?</li> <li>The customer wants to keep comfort parameters under control, according to outside conditions</li> <li>The customer wants to reduce the CO2 emissions</li> <li>CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section): <ul> <li>Activity 1: How much is the KER crucial to perform the activity?</li> <li>Nice to have</li> </ul> </li> <li>CUSTOMER CAINS: What are the gains – among those previously listed – the KER can help achieving (refer to the gains identified in the previous section)?</li> <li>The customer wants to reduce the CO2 emissions. How? Reduces environmental impact by up to 60% compared to gas boilers and air conditioners</li> </ul> <li>What is the primary target market? <ul> <li>Neal estate management</li> <li>Nother (please specify) Residential and tertiary existing buildings</li> </ul> </li> <li>The market targeted by this innovation is: <ul> <li>Nother market is not yet existing but the innovation has clear potential to create a new market</li> </ul> </li> <li>Market dynamics: is the market?</li>
Value proposition	<ul> <li>To pay the electricity bills</li> <li>What are the gains the customer aims at, while doing the previous activities?</li> <li>The customer wants to keep comfort parameters under control, according to outside conditions</li> <li>The customer wants to reduce the CO2 emissions</li> <li>CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):         <ul> <li>Activity 1: How much is the KER crucial to perform the activity?</li> <li>Nice to have</li> </ul> </li> <li>CUSTOMER GAINS: What are the gains – among those previously listed – the KER can help achieving (refer to the gains identified in the previous section)?</li> <li>The customer wants to reduce the CO2 emissions. How? Reduces environmental impact by up to 60% compared to gas boilers and air conditioners</li> <li>What is the primary target market?         <ul> <li>Meal estate management</li> <li>Mother (please specify) Residential and tertiary existing buildings</li> </ul> </li> <li>The market targeted by this innovation is:         <ul> <li>Mean market is not yet existing but the innovation has clear potential to create a new market</li> </ul> </li> </ul>
Value proposition	1. To pay the electricity bills  What are the gains the customer aims at, while doing the previous activities? 1. The customer wants to keep comfort parameters under control, according to outside conditions 2. The customer wants to reduce the CO2 emissions  CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • ⊠Nice to have  CUSTOMER GAINS:  What are the gains – among those previously listed – the KER can help achieving (refer to the gains identified in the previous section)?  1. The customer wants to reduce the CO2 emissions. How? Reduces environmental impact by up to 60% compared to gas boilers and air conditioners  What is the primary target market?  • ⊠Real estate management  • ⊠Other (please specify) Residential and tertiary existing buildings  The market targeted by this innovation is:  • ⊠The market is not yet existing but the innovation has clear potential to create a new market  Market dynamics: is the market?  • ⊠ Growing
Value proposition	1. To pay the electricity bills  What are the gains the customer aims at, while doing the previous activities? 1. The customer wants to keep comfort parameters under control, according to outside conditions 2. The customer wants to reduce the CO2 emissions  CUSTOMER JOBS:  Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • ⊠Nice to have  CUSTOMER GAINS:  What are the gains – among those previously listed – the KER can help achieving (refer to the gains identified in the previous section)?  1. The customer wants to reduce the CO2 emissions. How? Reduces environmental impact by up to 60% compared to gas boilers and air conditioners  What is the primary target market?  • ⊠Real estate management  • ⊠Other (please specify) Residential and tertiary existing buildings  The market targeted by this innovation is:  • ⊠The market is not yet existing but the innovation has clear potential to create a new market  Market dynamics: is the market?  • ⊠ Growing  Are there other markets for this innovation that the innovators are not yet targeting?
Value proposition	1. To pay the electricity bills  What are the gains the customer aims at, while doing the previous activities? 1. The customer wants to keep comfort parameters under control, according to outside conditions 2. The customer wants to reduce the CO2 emissions  CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • ⊠Nice to have  CUSTOMER GAINS:  What are the gains – among those previously listed – the KER can help achieving (refer to the gains identified in the previous section)?  1. The customer wants to reduce the CO2 emissions. How? Reduces environmental impact by up to 60% compared to gas boilers and air conditioners  What is the primary target market?  • ⊠Real estate management  • ⊠Other (please specify) Residential and tertiary existing buildings  The market targeted by this innovation is:  • ⊠The market is not yet existing but the innovation has clear potential to create a new market  Market dynamics: is the market?  • ⊠ Growing
Value proposition	1. To pay the electricity bills  What are the gains the customer aims at, while doing the previous activities?  1. The customer wants to keep comfort parameters under control, according to outside conditions  2. The customer wants to reduce the CO2 emissions  CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • ⊠Nice to have  CUSTOMER GAINS: What are the gains – among those previously listed – the KER can help achieving (refer to the gains identified in the previous section)?  1. The customer wants to reduce the CO2 emissions. How? Reduces environmental impact by up to 60% compared to gas boilers and air conditioners  What is the primary target market?  • ⊠Real estate management  • ⊠Other (please specify) Residential and tertiary existing buildings  The market targeted by this innovation is:  • ⊠The market is not yet existing but the innovation has clear potential to create a new market  Market dynamics: is the market?  • ⊠ Growing  Are there other markets for this innovation that the innovators are not yet targeting?  • ⊠ No
Value proposition	1. To pay the electricity bills  What are the gains the customer aims at, while doing the previous activities? 1. The customer wants to keep comfort parameters under control, according to outside conditions 2. The customer wants to reduce the CO2 emissions  CUSTOMER JOBS:  Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • ⊠Nice to have  CUSTOMER GAINS:  What are the gains – among those previously listed – the KER can help achieving (refer to the gains identified in the previous section)?  1. The customer wants to reduce the CO2 emissions. How? Reduces environmental impact by up to 60% compared to gas boilers and air conditioners  What is the primary target market?  • ⊠Real estate management  • ⊠Other (please specify) Residential and tertiary existing buildings  The market targeted by this innovation is:  • ⊠The market is not yet existing but the innovation has clear potential to create a new market  Market dynamics: is the market?  • ⊠ Growing  Are there other markets for this innovation that the innovators are not yet targeting?





Market – Business	examples of business models	i .		ent. Very well
model	Business Model	Scarcely applicable	Applicable	applicable
	Product to service model	Х		аррисавто
	ESCO - energy performance	· · · · · · · · · · · · · · · · · · ·		
	contract		X	
	ESCO - energy supply		X	
	contract		^	
	Franchise model		X	
	Distribution model	X		
	Manufacturer model		X	
	Peer-to-peer model		X	
	Direct sales model		X	
	Affiliate marketing model		X	
	Consulting model		Χ	
	Product as a service		X	
	□ <u>Within 12 months</u> afte 1. Technology t	at of the implemented solu or the project: cransfer to a third party int		
		strial partner to upscale th	ne solution and to lau	nch it into the market
Go to Market - IPR	Please check <b>if there is any typ</b> and that helped the developn	strial partner to upscale the of Intellectual property nent of the solution. For	ne solution and to laur already secured (bef	nch it into the market fore the project started)
Market – IPR	Please check <b>if there is any typ</b> and that helped the developn please refer to the last pages of	strial partner to upscale the of Intellectual property nent of the solution. For	ne solution and to laur already secured (bef definition and examp	nch it into the market fore the project started)
	Please check <b>if there is any typ</b> and that helped the developed please refer to the last pages of <b>Type</b>	strial partner to upscale the of Intellectual property nent of the solution. For	ne solution and to laur already secured (bef	nch it into the market fore the project started)
Market – IPR	Please check <b>if there is any typ</b> and that helped the developed please refer to the last pages of <b>Type</b> Patent	strial partner to upscale the of Intellectual property nent of the solution. For	ne solution and to laur already secured (bef definition and examp	nch it into the market fore the project started)
Market – IPR	Please check <b>if there is any typ</b> and that helped the developed please refer to the last pages of <b>Type</b>	strial partner to upscale the of Intellectual property nent of the solution. For	ne solution and to laur already secured (bef definition and examp	nch it into the market fore the project started)
Market – IPR	Please check <b>if there is any typ</b> and that helped the develope please refer to the last pages of  Type Patent Trade secret	strial partner to upscale the of Intellectual property nent of the solution. For	ne solution and to laur already secured (bef definition and examp	nch it into the market fore the project started)
Market – IPR	Please check if there is any typ and that helped the develope please refer to the last pages of Type Patent Trade secret Copyright Trademark	strial partner to upscale the of Intellectual property nent of the solution. For f this document.	ne solution and to laur already secured (bef definition and examp Owner	nch it into the market fore the project started) ples of IP instruments,
Market – IPR Background Go to Market – IPR	Please check if there is any typ and that helped the develope please refer to the last pages of Type Patent Trade secret Copyright	strial partner to upscale the of Intellectual property nent of the solution. For f this document.	ne solution and to laur already secured (bef definition and examp Owner	nch it into the market fore the project started) ples of IP instruments,
Market – IPR Background	Please check if there is any type and that helped the developm please refer to the last pages of Type Patent Trade secret Copyright Trademark  Please check if the developed one (or more) type of Intellect Type	strial partner to upscale the of Intellectual property nent of the solution. For f this document.  d solution (within the entual property:	ne solution and to laur already secured (bef definition and examp  Owner  d of the project) cor  Owners	nch it into the market fore the project started) ples of IP instruments
Market – IPR Background Go to Market – IPR	Please check if there is any type and that helped the developed please refer to the last pages of Type Patent Trade secret Copyright Trademark  Please check if the developed one (or more) type of Intellect Type Patent	strial partner to upscale the of Intellectual property nent of the solution. For f this document.	ne solution and to laur already secured (bef definition and examp  Owner  d of the project) cor  Owners	nch it into the market fore the project started) ples of IP instruments
Market – IPR Background Go to Market – IPR	Please check if there is any type and that helped the developm please refer to the last pages of Type Patent Trade secret Copyright Trademark  Please check if the developed one (or more) type of Intellect Type Patent Trade secret	strial partner to upscale the of Intellectual property nent of the solution. For f this document.  d solution (within the entual property:  X (modular solution to be	ne solution and to laur already secured (bef definition and examp  Owner  d of the project) cor  Owners	nch it into the market fore the project started) ples of IP instruments,
Market – IPR Background Go to Market – IPR	Please check if there is any type and that helped the developm please refer to the last pages of Type Patent Trade secret Copyright Trademark  Please check if the developed one (or more) type of Intellect Type Patent Trade secret	strial partner to upscale the of Intellectual property nent of the solution. For f this document.  d solution (within the entual property:	ne solution and to laur already secured (bef definition and examp  Owner  d of the project) cor  Owners	nch it into the market fore the project started) ples of IP instruments





## 5.5.2 KER 6 international patent scenario overview

The query submitted to Patsnap, which revolved around the concepts of geothermal wall system, geothermal heat exchange wall, geothermal building envelope and synonyms, revealed 53 INPADOC families. An INPADOC family is a "collection of patent documents covering a technology. The technical content covered by the applications is similar, but not necessarily the same. Members of an extended patent family will have at least one priority in common with at least one other member - either directly or indirectly" (European Patent Office)<sup>9</sup>.

#### 5.5.2.1 Patenting trend

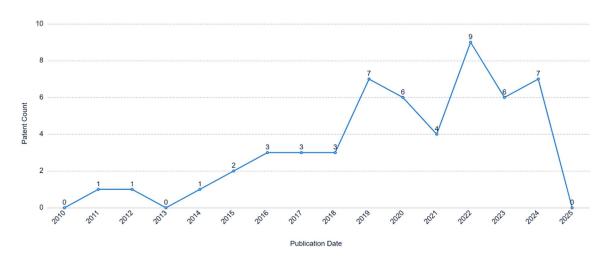


Figure 5. KER 6 - Patenting trend

The patent publication trend suggests that KER 6 is a quite novel technology, as the majority of patents were submitted from 2019. The trend is rising, which suggests that there may be a further increase in patenting in the coming years. Of the 53 patent families identified, 25 are active (47%), 24 are inactive and 4 are pending.

For all the KERs, it has to be noted that 2025 results are not representative, as the analysis was conducted in January 2025.

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<sup>&</sup>lt;sup>9</sup> European Patent Office (EPO)





#### 5.5.2.2 Top IPCs

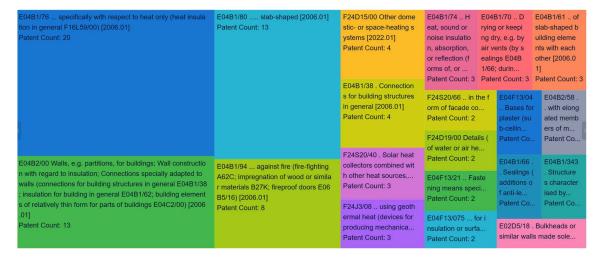


Figure 6. KER 6 - Top IPCs

In Figure 6 are shown the major technology areas. The majority of patents is part of the IPC subclass E04B, which represents "General building constructions; walls, e.g. partitions; roofs; floors; ceilings; insulation or other protection of buildings".

# 5.5.2.3 Top authorities

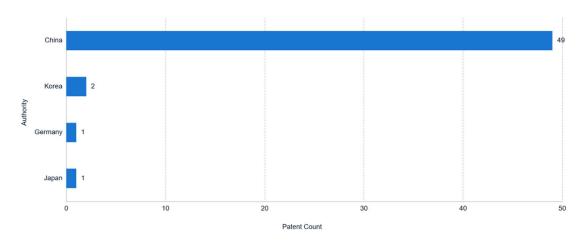


Figure 7. KER 6 - Top authorities

Almost the entirety of the applications was performed in China, which appears to be the most active country in the research related to geothermal wall systems.





#### 5.5.2.4 Top assignees



Figure 8. KER 6 - Top assignees

The most interesting outcome of the top assignees analysis is that the research on this topic is very fragmented, as there is no organization with more than two patents submitted. This also means that, at the moment, there are no large companies heavily investing in this technology (by performing R&D or by acquiring already existing patents).





# 5.6 KER 7: Window Solar Shading Control Using Recycled PV Cell

# 5.6.1 KER 7 Characterization Table

**Table 9. KER 7 - Characterization Table** 

Name of the K	ED: Window Solar Shading Control Using Docycled DV Coll (ISSE)
Involved partn	ER: Window Solar Shading Control Using Recycled PV Cell (IS25)
KER Leader(s):	
Problem	Is this:
/need	<ul> <li>         \sum A technical need. Please detail (e.g. higher performance, longer duration, different features, different standards) - Life cycle assessment for damaged PV panels     </li> <li>         \sum A sustainability need. Please detail (e.g. lower consumption, lower level of pollutants, different social impact) - Window shading and renewable energy production in the same time using recycled PV cells     </li> </ul>
	Geographical level:
	⊠European
	⊠Global
	Does the need come from:
Description	What is the nature of the KER?
	Other (please specify) - Damaged PV cells recycling
	Please provide a description of the KER.
	PV modules with electrical faults, repaired and installed as BIPV curtain shade on buildings facades.  What is the level of innovation?
	Some distinct, probably minor, improvements over existing products
Alternative	Probably, there's already one (or several) solution to the problem available in the market, but:
solution	Il doesn't solve the full problem
	Ilt is difficult to implement
	Ilt is not commercially mature
	Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.
	No alternative solutions were identified at this stage.
	Has your company (or someone in the consortium) already developed a solution for the identified need before this project started?  ■ 図No  Can we say that this solution is the starting point of the current project development activities?
	• No
"Market" – Early Adopters	Who are the potential early customers for this KER? Please make sure they reflect your choices in the Need/Problem section (e.g. type of customer, geography)  •
Adopters	⊠Research and academic bodies
	Who are the potential final users?
	Individuals
	For the private company/companies, will this innovation be used by mainly current or new customers?
	New customers
Value	What are the activities (Customer jobs) the customer usually performs, where our KER would be
proposition – Customer	needed?  1. Daily Office Activities
profile	What are the pains the customer encounters while doing the previous activities?  1. Too much and too bright sunlight
	What are the gains the customer aims at, while doing the previous activities?  1. Better work conditions and some PV electricity generation
Value	CUSTOMER JOBS:
proposition	Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?
	- <u>Activity</u> : How mach is the NEW Gradian to perform the activity:





	-			
	⊠Nice to have	9		
	CUSTOMER PAINS: What are the pains – among (refer to the pains identified ir 1. Too much and too bright so	the previous section	)?	reducing or avoiding
	CUSTOMER GAINS: What are the gains – among t gains identified in the previou 1. Local electricity production	s section)?		chieving (refer to the
"Market" –	What is the primary target ma	rket?		
Target	⊠Real estate manager			
market	<b>.</b>			
	Please specify the most relevant Tertiary building sector	int sub-sector(s) of the	e KER, within the selec	ted market:
	The market targeted by this in  • \times The market is not yet		ition has clear potential t	to create a new market
	Market dynamics: is the market ■ Growing	et?		
	Are there other markets for th  ■ No	is innovation that the	innovators are not yet	targeting?
	Market competition: How stro  ■ ☑ Patchy, no major pla	-	he target market?	
"Market" -	Please make a list of the co		the same field (e.g.	the manufacturers /
Competitors	providers of the alternative so			,
Co to Manhot	No competitors were identified			la Fandathia
Go to Market  – Business	What are the relevant Busine examples of business models,	ss models and now m	nucn are tney applicab at pages of this docume	ole. For definition and
	<u></u>			
model	Business Model	Scarcely applicable	Applicable	Very well applicable
model	Bundling model	Scarcely applicable X		Very well
model	Bundling model Leasing model	Scarcely applicable		Very well
model	Bundling model Leasing model ESCO - energy performance	Scarcely applicable X		Very well
model	Bundling model Leasing model ESCO - energy performance contract	Scarcely applicable X X		Very well applicable
model	Bundling model Leasing model ESCO - energy performance contract ESCO - energy supply	Scarcely applicable X		Very well applicable
model	Bundling model Leasing model ESCO - energy performance contract	Scarcely applicable  X X		Very well applicable
model	Bundling model Leasing model ESCO - energy performance contract ESCO - energy supply contract ESCO - build-own-operate- transfer	Scarcely applicable  X  X  X		Very well applicable
model	Bundling model Leasing model ESCO - energy performance contract ESCO - energy supply contract ESCO - build-own-operate- transfer Franchise model	Scarcely applicable  X X	Applicable	Very well applicable
model	Bundling model Leasing model ESCO - energy performance contract ESCO - energy supply contract ESCO - build-own-operate-transfer Franchise model Distribution model	Scarcely applicable  X  X  X		Very well applicable  X
model	Bundling model Leasing model ESCO - energy performance contract ESCO - energy supply contract ESCO - build-own-operate-transfer Franchise model Distribution model Manufacturer model	Scarcely applicable  X  X  X	Applicable	Very well applicable
model	Bundling model Leasing model ESCO - energy performance contract ESCO - energy supply contract ESCO - build-own-operate-transfer Franchise model Distribution model Manufacturer model Retailer model	Scarcely applicable  X  X  X	Applicable	Very well applicable  X
model	Bundling model Leasing model ESCO - energy performance contract ESCO - energy supply contract ESCO - build-own-operate- transfer Franchise model Distribution model Manufacturer model Retailer model Peer-to-peer model	Scarcely applicable  X  X  X	Applicable	Very well applicable  X  X
model	Bundling model Leasing model ESCO - energy performance contract ESCO - energy supply contract ESCO - build-own-operate- transfer Franchise model Distribution model Manufacturer model Retailer model Direct sales model	Scarcely applicable  X  X  X  X  X	Applicable	Very well applicable  X
model	Bundling model Leasing model ESCO - energy performance contract ESCO - energy supply contract ESCO - build-own-operate- transfer Franchise model Distribution model Manufacturer model Retailer model Peer-to-peer model	Scarcely applicable  X  X  X	Applicable	Very well applicable  X  X
Go to Market	Bundling model Leasing model ESCO - energy performance contract ESCO - energy supply contract ESCO - build-own-operate-transfer Franchise model Distribution model Manufacturer model Retailer model Peer-to-peer model Direct sales model Affiliate marketing model Product as a service	Scarcely applicable  X  X  X  X  X  X  X	X X X	Very well applicable  X  X
Go to Market	Bundling model Leasing model ESCO - energy performance contract ESCO - energy supply contract ESCO - build-own-operate-transfer Franchise model Distribution model Manufacturer model Retailer model Peer-to-peer model Direct sales model Affiliate marketing model Product as a service  Please check if there is any t started) and that helped the	Scarcely applicable  X X X  X  X  X  X  X  A  X  A  A  A  A	X  X  X  X  roperty already secure solution. For definition	Very well applicable  X  X  X  A  X  A  A  A  A  A  A  A  A
Go to Market	Bundling model Leasing model ESCO - energy performance contract ESCO - energy supply contract ESCO - build-own-operate-transfer Franchise model Distribution model Manufacturer model Retailer model Peer-to-peer model Direct sales model Affiliate marketing model Product as a service  Please check if there is any to started) and that helped the instruments, please refer to the	Scarcely applicable  X X X  X  X  X  X  X  A  X  A  A  A  A	X  X  X  X  xoperty already secure solution. For definition ment.	Very well applicable  X  X  X  A  X  A  A  A  A  A  A  A  A
Go to Market	Bundling model Leasing model ESCO - energy performance contract ESCO - energy supply contract ESCO - build-own-operate-transfer Franchise model Distribution model Manufacturer model Retailer model Peer-to-peer model Direct sales model Affiliate marketing model Product as a service  Please check if there is any t started) and that helped the instruments, please refer to the	Scarcely applicable  X X X  X  X  X  X  X  A  X  A  A  A  A	X  X  X  X  roperty already secure solution. For definition	Very well applicable  X  X  X  A  X  A  A  A  A  A  A  A  A
Go to Market	Bundling model Leasing model ESCO - energy performance contract ESCO - energy supply contract ESCO - build-own-operate-transfer Franchise model Distribution model Manufacturer model Retailer model Peer-to-peer model Direct sales model Affiliate marketing model Product as a service  Please check if there is any t started) and that helped the instruments, please refer to the	Scarcely applicable  X X X  X  X  X  X  X  A  X  A  A  A  A	X  X  X  X  xoperty already secure solution. For definition ment.	Very well applicable  X  X  X  A  X  A  A  A  A  A  A  A  A
Go to Market	Bundling model Leasing model ESCO - energy performance contract ESCO - energy supply contract ESCO - build-own-operate-transfer Franchise model Distribution model Manufacturer model Retailer model Peer-to-peer model Direct sales model Affiliate marketing model Product as a service  Please check if there is any t started) and that helped the instruments, please refer to the Type Patent Trade secret	Scarcely applicable  X X X  X  X  X  X  X  A  X  A  A  A  A	X  X  X  X  xoperty already secure solution. For definition ment.	Very well applicable  X  X  X  A  X  A  A  A  A  A  A  A  A
Go to Market	Bundling model Leasing model ESCO - energy performance contract ESCO - energy supply contract ESCO - build-own-operate-transfer Franchise model Distribution model Manufacturer model Retailer model Peer-to-peer model Direct sales model Affiliate marketing model Product as a service  Please check if there is any t started) and that helped the instruments, please refer to the	Scarcely applicable  X X X  X  X  X  X  X  A  X  A  A  A  A	X  X  X  X  xoperty already secure solution. For definition ment.	Very well applicable  X  X  X  A  X  A  A  A  A  A  A  A  A
Go to Market	Bundling model Leasing model ESCO - energy performance contract ESCO - energy supply contract ESCO - build-own-operate-transfer Franchise model Distribution model Manufacturer model Retailer model Peer-to-peer model Direct sales model Affiliate marketing model Product as a service  Please check if there is any t started) and that helped the instruments, please refer to the  Type Patent Trade secret Copyright	Scarcely applicable  X X X  X  X  X  X  X  X  X  A  X  X  A  X  A  A	X  X  X  X  Owner	X  X  X  Add (before the project and examples of IP
Go to Market - IPR Background  Go to Market - IPR	Bundling model Leasing model ESCO - energy performance contract ESCO - energy supply contract ESCO - build-own-operate-transfer Franchise model Distribution model Manufacturer model Retailer model Peer-to-peer model Direct sales model Affiliate marketing model Product as a service  Please check if there is any t started) and that helped the instruments, please refer to the Type Patent Trade secret Copyright Trademark	X X X X X X X X X X X X X X X X X X X	X  X  X  X  Owner	X  X  X  Add (before the project and examples of IP
Go to Market - IPR Background	Bundling model Leasing model ESCO - energy performance contract ESCO - energy supply contract ESCO - build-own-operate-transfer Franchise model Distribution model Manufacturer model Retailer model Peer-to-peer model Direct sales model Affiliate marketing model Product as a service  Please check if there is any t started) and that helped the instruments, please refer to the Type Patent Trade secret Copyright Trademark	X X X X X X X X X X X X X X X X X X X	X  X  X  X  Owner	X  X  X  Add (before the project and examples of IP
Go to Market - IPR Background  Go to Market - IPR	Bundling model  Leasing model  ESCO - energy performance contract  ESCO - energy supply contract  ESCO - build-own-operate-transfer  Franchise model  Distribution model  Manufacturer model  Retailer model  Peer-to-peer model  Direct sales model  Affiliate marketing model  Product as a service  Please check if there is any t started) and that helped the instruments, please refer to the Type  Patent  Trade secret  Copyright  Trademark  Please check if the developed one (or more) type of Intellect  Type  Patent	X X X X X X X X X X X X X X X X X X X	X  X  X  X  roperty already secure solution. For definition ment.  Owner	X  X  X  Add (before the project and examples of IP
Go to Market - IPR Background  Go to Market - IPR	Bundling model  Leasing model  ESCO - energy performance contract  ESCO - energy supply contract  ESCO - build-own-operate-transfer  Franchise model  Distribution model  Manufacturer model  Retailer model  Peer-to-peer model  Direct sales model  Affiliate marketing model  Product as a service  Please check if there is any t started) and that helped the instruments, please refer to the Type  Patent  Trade secret  Copyright  Trademark  Please check if the developed one (or more) type of Intellect  Type  Patent  Trade secret	X X X X X X X X X X X X X X X X X X X	X  X  X  X  roperty already secure solution. For definition ment.  Owner	X  X  X  Add (before the project and examples of IP
Go to Market - IPR Background  Go to Market - IPR	Bundling model  Leasing model  ESCO - energy performance contract  ESCO - energy supply contract  ESCO - build-own-operate-transfer  Franchise model  Distribution model  Manufacturer model  Retailer model  Peer-to-peer model  Direct sales model  Affiliate marketing model  Product as a service  Please check if there is any t started) and that helped the instruments, please refer to the Type  Patent  Trade secret  Copyright  Trademark  Please check if the developed one (or more) type of Intellect  Type  Patent	X X X X X X X X X X X X X X X X X X X	X  X  X  X  roperty already secure solution. For definition ment.  Owner	X  X  X  Add (before the project and examples of IP





## 5.6.2 KER 7 international patent scenario overview

The query submitted to Patsnap, which revolved around the concepts of PV window shading and window solar shading, revealed 10 INPADOC families.

#### 5.6.2.1 Patenting trend

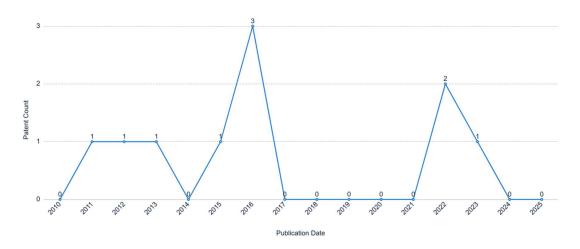


Figure 9. KER 7 - Patenting trend

The low number of records (result of a quite specific query) does not allow to identify a trend in the patent applications. However, research on new PV panels applications is currently a very important research field, so it is likely that new patent applications will be performed in the coming years.

#### **5.6.2.2 Top IPCs**

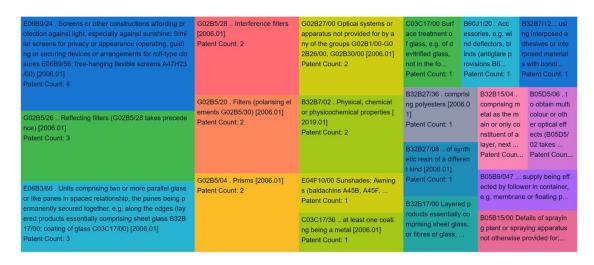


Figure 10. KER 7 - Top IPCs





The majority of patents is part of the IPC subclasses E06B "Fixed or movable closures for openings in buildings, vehicles, fences, or like enclosures, in general, e.g. doors, windows, blinds, gates" and G02B "Optical elements, systems or apparatus".

#### 5.6.2.3 Top authorities

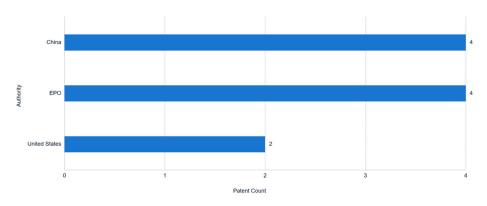


Figure 11. KER 7 - Top authorities

It is very interesting to note the role of Europe, as 4 applications were for EPO patents, which offers protection in all the EU countries and in the following non-EU countries: Albania, Iceland, Liechtenstein, Monaco, North Macedonia, Norway, San Marino, Serbia, Switzerland, Turkey, and the United Kingdom.

### 5.6.2.4 Top assignees

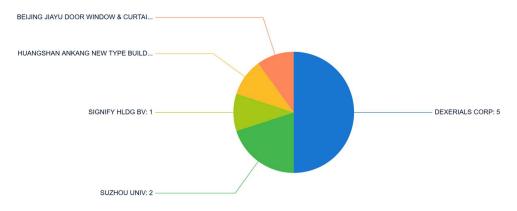


Figure 12. KER 7 - Top assignees

Dexerials Corporation has performed 5 of the 10 patent applications. Interesting is also the patent application performed by the Dutch corporation Signify, a leading company in connected LED lighting systems, software and services.





# 5.7 KER 8: V2G EV Charger

# 5.7.1 KER 8 Characterization Table

**Table 10. KER 8 - Characterization Table** 

Name of the I	KER: V2G EV Charger
Involved part	
KER Leader(s	): TUCN
Problem	Is this:
/need	■ MA financial/cost need. Please detail (e.g. lower CAPEX or OPEX, lower price, faster return on the state of the st
	investment) - Cost-effectiveness study of EV under V2B conditions
	Geographical level:
	• ⊠European
	• ⊠Global
	Does the need come from:
	Business/industrial customers
	SPublic entities
Description	What is the nature of the KER?
Description	New service (except consulting services)
	Please provide a description of the KER.
	TUCN will demonstrate the cost-effectiveness of the V2G system, under V2B conditions, which utilizes
	the stored energy in electric vehicle (EV) batteries during periods of peak electricity demand, to
	provide cost savings to facility operators who incur high costs for power consumption during these
	periods. The V2G EV charger software will interface with the local TUCN's BEMS to demonstrate a
	functioning demand response V2G solution.
	What is the level of innovation?
	Some distinct, probably minor, improvements over existing products
Alternative	Probably, there's already one (or several) solution to the problem available in the market, but:
solution	MOther (please specify)
Solution	Can you make a list of 3/4 products (or services) already available in the market that are trying to
	solve the same need as this KER? If possible, please provide a link to a reference website for
	further information.
	13.13.11.11.11.11.11.11.11.11.11.11.11.1
	No alternative solution was identified at this stage.
	Has your company (or someone in the consortium) already developed a solution for the identified
	need before this project started?
	• ⊠No
	Can we say that this solution is the starting point of the current project development activities?
	• ⊠No
"Market" –	Who are the potential early customers for this KER? Please make sure they reflect your choices
Early	in the Need/Problem section (e.g. type of customer, geography)
Adopters	⊠Private Large enterprises
	⊠Research and academic bodies
	Who are the potential final users?
	MIndividuals
	Industry:
	o ⊠One or several managers
	a Borie of Several Hariagers
	For the private company/companies, will this innovation be used by mainly current or new
	customers?
	New customers
Value	What are the activities (Customer jobs) the customer usually performs, where our KER would be
proposition	needed?
- Customer	Balancing day ahead energy consumption
profile	What are the pains the customer encounters while doing the previous activities?
	The customer does not have a convenient way of storing energy
	What are the gains the customer aims at, while doing the previous activities?
	The customer wants to reduce energy bill
Value	CUSTOMER JOBS:
proposition	Please confirm in which customer activity/process the KER can be integrated and how much it is
p. oposicion	relevant (refer to the activities identified in the previous section):
	Activity 1: How much is the KER crucial to perform the activity?
	Nice to have





	CUSTOMER PAINS: What are the pains – among to the pains identified in the		ne KER can help red	ucing or avoiding (refer
	The customer does     temporary energy st	not have a convenient way	of storing energy Ho	w? By providing on-site
	CUSTOMER GAINS: What are the gains – amon gains identified in the previ	g those previously listed -	the KER can help	achieving (refer to the
	Customer reduces e	nergy bill How? Demand re	sponse scenarios, en	eray peak shaving
"Market" –	What is the primary target i	-		
Target market	⊠Real estate manag			
	Please specify the most rele Tertiary building sector	evant sub-sector(s) of the K	ER, within the selec	cted market:
	The market targeted by this  • ☑ The market is not create a new marke	t yet existing and it is not ye	et clear that the inn	ovation has potential to
	Market dynamics: is the ma • ⊠ Growing	rket?		
	Are there other markets for  • ⊠ No	this innovation that the in	novators are not ye	t targeting?
	Market competition: How st  ■ ☑ Patchy, no major		target market?	
"Market" - Competitors	Please make a list of the con of the alternative solutions			nufacturers / providers
	No competitors were identifie			
Go to Market –	What are the relevant Busi examples of business mode	ness models and how mu	ch are they applica	ble. For definition and
Business model	Business Model	Scarcely applicable	Applicable	Very well applicable
	Freemium model		Х	
	Peer-to-peer model		X	
	Software as a service		X	
Go to Market – IPR	Please check <b>if there is any ty</b> and that helped the develop	oment of the solution. For		
Background	please refer to the last pages	of this document.		
	Type Patent		Owner	
	Trade secret			
	Copyright			
	Trademark			
Go to	Please check if the develope		of the project) could	l be protected with one
Market – IPR Foreground	(or more) type of Intellectua	il property:	Owners	
roreground	Patent		- Owners	
	Trade secret			
	Copyright			
	Trademark			

# 5.7.2 KER 8 international patent scenario overview

The query submitted to Patsnap, which revolved around the concepts of V2G, EVs and charging system revealed 447 INPADOC families.





## 5.7.2.1 Patenting trend

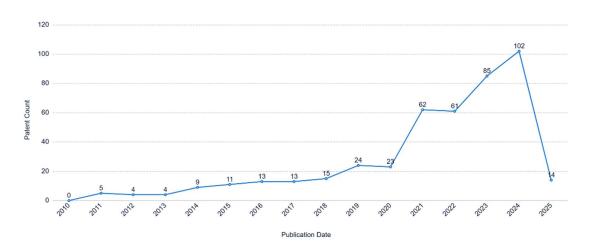


Figure 13. KER 8 - Patenting trend

The trend is clearly a growing one, with patent publications rising significantly from 2021. This trend indicates that the market is in its initial stages, where a lot of R&D is performed; a plateau in the patenting trend would, instead, indicate a mature and established market.

#### **5.7.2.2 Top IPCs**

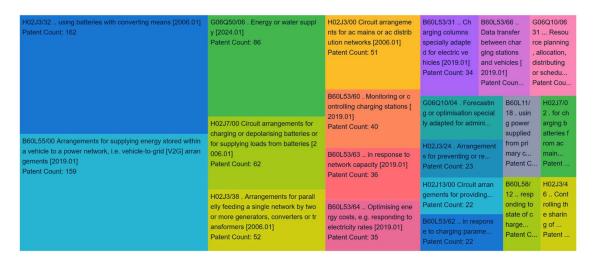


Figure 14. KER 8 - Top IPCs

The majority of patents is part of the IPC subclasses H02J "Circuit arrangements or systems for supplying or distributing electric power; systems for storing electric energy" and B60L "Propulsion of electrically-propelled vehicles; supplying electric power for auxiliary equipment of electrically-propelled vehicles; electrodynamic





brake systems for vehicles in general; magnetic suspension or levitation for vehicles; monitoring operating variables of electrically-propelled vehicles; electric safety devices for electrically-propelled vehicles".

#### 5.7.2.3 Top authorities

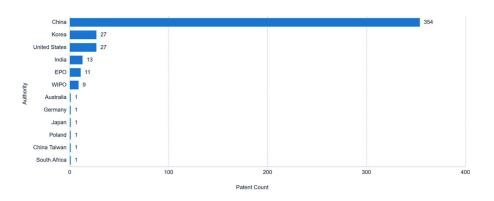


Figure 15. KER 8 - Top authorities

China is by far the country where the most patent applications are submitted. Research is also active in Korea, US and India. 9 patent applications required global protection (WIPO patents).

#### 5.7.2.4 Top assignees



Figure 16. KER 8 - Top assignees

Usually, for novel technologies, the top assignees are mostly universities and research centers, which are the main actors in the research at low TRLs. In this case it's easy to note the predominance of large companies which are very interested in commercializing the technology.





# 5.8 KER 9: Power-to-Hydrogen-to-Power Compact System

# 5.8.1 KER 9 Characterization Table

**Table 11. KER 9 - Characterization Table** 

Name of the K	ER: Power-to-Hydrogen-to-Power Compact System – MOSE (IS27) (HW)"
Involved partn	
KER Leader(s):	
Problem	Is this:
/need	<ul> <li>         \square A technical need. Please detail (e.g. higher performance, longer duration, different features, different standards) - FULL CERTIFICATION, TESTS ALSO TO CHECK THE FINAL LIFETIME OF SYSTEM     </li> </ul>
	<ul> <li>         MA financial/cost need. Please detail (e.g. lower CAPEX or OPEX, lower price, faster return on investment) - OPTIMIZING THE CAPEX     </li> </ul>
	Geographical level:
	• ⊠Global
	Does the need come from:  ■ ☑ Private customers
Description	What is the nature of the KER?
Description	Mew product
	Please provide a description of the KER.
	Power-to-hydrogen-to-power-solution based on PEM Fuel Cell and Electrolyzer and a metal hydride
	storage for an easier installation: everything integrated in a 10 ft container and managed by a single
	controller.
	What is the level of innovation?
	<ul> <li>\( \sums \) Some distinct, probably minor, improvements over existing products</li> </ul>
Alternative	Probably, there's already one (or several) solution to the problem available in the market, but:
solution	<ul> <li>It is mature but not robust enough</li> </ul>
	<ul> <li>Mother (please specify) - BATTERY SOLUTIONS ARE LESS SUSTAINABLE AND CANNOT STORE ENERGY FOR LONG TIME</li> </ul>
	Can you make a list of 3/4 products (or services) already available in the market that are trying
	to solve the same need as this KER? If possible, please provide a link to a reference website for
	further information.
	<ol> <li>Batteries</li> <li>Whatever other type of Electrolyzer + FC + compressed hydrogen storage</li> </ol>
	Can you find a main drawback or a limitation for each of the alternative solutions you provided?
	Limited Energy capacity – less sustainable materials
	2. Permitting issues due to compressed H2
	Has your company (or someone in the consortium) already developed a solution for the identified
	need before this project started?
	<ul> <li>         \undersigned No     </li> <li>Can we say that this solution is the starting point of the current project development activities?</li> </ul>
	If "Yes" then please specify the product or service already developed ("the starting point").
	MOSE ELECTROLYSER as a single solution or coupled (also for thermal management of the metal hydrides) with HYDOR Rack
	Let's compare the KER with what we already had in the consortium. What are the main
	advancements respect to the "starting point" (the initial solution available in the consortium)? If
	possible, please give numerical figures that can quantify advancements.
	SOther – Larger energy storage capacity
	Let's make some comparison with the benchmark. What are the main advancements respect to
	the alternative solutions (A, B, C, D) you have previously identified? If possible, please give numerical figures that can quantify advancements.
	Alternative solution A
	🛮 🖺 Other – Larger energy capacity – higher environmental sustainability
	Alternative solution B
	<ul> <li>■Other – Easier permitting (H2 storage at lower pressure for MH)</li> </ul>
"Market" – Early	Who are the potential early customers for this KER? Please make sure they reflect your choices in the Need/Problem section (e.g. type of customer, geography)
Adopters	
	⊠Research and academic bodies
	■Other, Energy community's managers
	Who are the potential final users?
	⊠Industry:





		RGY MANAGERS		
	<ul> <li>■Public bodies / authority</li> </ul>			
	o ⊠Other ENEF	RGY MANAGERS		
	<ul> <li>■Research and acade</li> </ul>	mic bodies		
	o ⊠Other ENEF	RGY MANAGERS/WHO HA	AVE A SMART GRID LA	BORATORY
	For the private company/corcustomers?	mpanies, will this innov	vation be used by m	ainly current or new
	<ul> <li>■Current customers</li> </ul>			
Value	What are the activities (Custo	mer jobs) the customer	usually performs, wh	ere our KER would be
proposition -	needed?	,	,	
Customer	<ol> <li>Operate the smart gr</li> </ol>	id/smart building and n	naximize self consum	ption of the local RES
profile	production			
	What are the pains the custor		oing the previous act	ivities?
	1. Look the CAPEX minir			
		ount of energy to be store		_
	b. Look at O&M	of the storage à minimu	m botnering and cost	S
	What are the gains the custor	nor sime at while doing	the previous activiti	067
	1. See above	ner anns at, wrine doing	g the previous activiti	es:
Value	CUSTOMER JOBS:			
proposition	Please confirm in which custo	omer activity/process th	ne KER can be integra	ated and how much it
p. oposition	is relevant (refer to the activit			
		s the KER crucial to perfo		
		ntary to a core solution	· ·	
"Market" –	What is the primary target ma	arket?		
Target	⊠Energy production/c	distribution/consumption	1	
market	<ul> <li>         \sum Other (please specify)     </li> </ul>	/) Laboratories of RTOs – e	energy communities	
		•	•	
	The market targeted by this in	nnovation is:		
	<ul> <li>■ Emerging: There is a</li> </ul>	a growing demand and fe	ew offerings are availa	ble
	Market dynamics: is the mark	et?		
	<ul><li>■ Growing</li></ul>			
	Are there other markets for th	is innevenien that the i		toracting?
	• ⊠ Yes	ils innovation that the ir	inovators are not yet	targeting:
	<b>■</b>			
	Market competition: How stro	ng is competition in the	e target market?	
		ition but none with a pro		ınder investigation
	⊠ Several major pla	ayers with strong com	npetencies, infrastruc	ture and offerings -
	PARTICULARLY IN BA	ATTERY SECTOR		· ·
"Market" -	Please make a list of the co	ompetitors working in	the same field (e.g.	the manufacturers /
Competitors	providers of the alternative so	lutions previously ment	tioned + others)	
	□ <u>SMEs</u> :	11.		
_		s://hybitat.tech/)		
Go to Market	What are the relevant Busine			
– Business model	examples of business models,	, please refer to the last	pages of this docume	Very well
model	Business Model	Scarcely applicable	Applicable	applicable
	Product to service model			Х
	Leasing model		X	Λ
	ESCO - energy performance		^	
	contract	X		
	ESCO - energy supply			
	contract	X		
	ESCO - build-own-operate-	X		
	transfer			
	Franchise model	X		
	Distribution model		X	
				V
	Manufacturer model			X
	Manufacturer model Retailer model		X	
	Manufacturer model Retailer model Direct sales model			X
	Manufacturer model Retailer model Direct sales model Affiliate marketing model	V	X	
	Manufacturer model Retailer model Direct sales model	X		





	Product as a service	X		
Go to Market - Timing	Please make an initial high- project, to make the solution be managed in the Exploitat  During the first mon  1. Certify the p  2. Identify furt  Within 6 months afte  Test at higher  Within 12 months aft  Test at higher  Within 24 months af  I Identify con	evel description of the ready to market - TRL9 ion Checklist):  th after the project: product the potential test opporter the project scale er the project: scale, thanks to test optiter the project: ppanies for facilitate the	eunities  mize the BoP and minir	ailed list of actions will mize footprint/costs etc.
Go to Market - IPR Background	Please check if there is any ty and that helped the develop please refer to the last pages  Type  Patent  Trade secret  Copyright  Trademark	ment of the solution. Fo	•	, ,
Go to Market – IPR Foreground	Please check if the develope one (or more) type of Intellectors  Type  Patent  Trade secret  Copyright  Trademark	ctual property:	<b>Owners</b> management of the syst	

# 5.8.2 KER 9 international patent scenario overview

The query submitted to Patsnap, which revolved around the concepts of power to hydrogen to power, power to X and hydrogen, revealed 8 INPADOC families.

# 5.8.2.1 Patenting trend

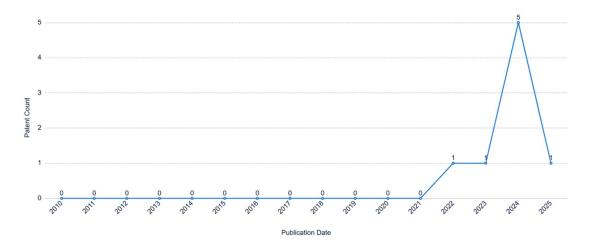


Figure 17. KER 9 - Patenting trend





The trend clearly indicates that this is a novel technology and that we are in the first stages of research. The number of patent applications is likely to increase rapidly in the next years.

## **5.8.2.2 Top IPCs**



Figure 18. KER 9 - Top IPCs

The majority of patents is part of the IPC subclass C25B "Electrolytic or electrophoretic processes for the production of compounds or non- metals; apparatus therefor".

## 5.8.2.3 Top authorities

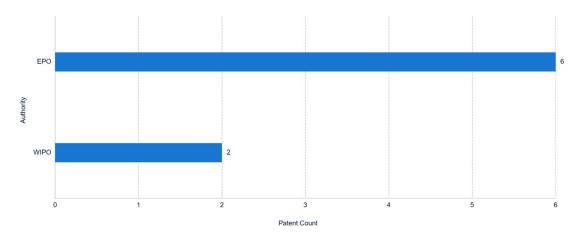


Figure 19. KER 9 - Top authorities





Very interesting is the fact that all the patent applications required European or global protection. Obtaining this type of protection is quite expensive, indicating that companies are very interested in this technology and foresee profitable applications in their reference markets.

## 5.8.2.4 Top assignees

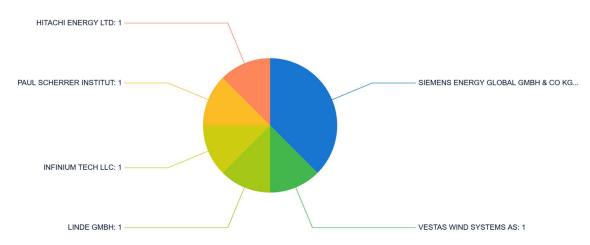


Figure 20. KER 9 - Top assignees

As anticipated, large and famous companies are investing in this technology. In particular, Siemens Energy applied for three different patents. The company already offers services related to Power to X (<a href="https://www.siemens-energy.com/global/en/home/products-services/solutions-usecase/hydrogen.html">https://www.siemens-energy.com/global/en/home/products-services/solutions-usecase/hydrogen.html</a>).





# 5.9 KER 10: Hybrid Long-Term Storage System

# 5.9.1 KER 10 Characterization Table

**Table 12. KER 10 - Characterization Table** 

IIIVOIVEU Palti	(ER: KER10 Hybrid Long-term storage System ners: ENTECH
KER Leader(s)	
Problem	Is this:
/need	MA technical need. Please detail (e.g. higher performance, longer duration, different)
,	features, different standards) long duration storage
	⊠All of them
	Geographical level:
	• ⊠Global
	Does the need come from:
	⊠Business/industrial customers
	NPublic entities
Description	What is the nature of the KER?
Description	New product
	Please provide a description of the KER.
	Optimized hydrogen-based hybrid long-term storage system comprising a 30 kW electrolyzer, 10 kW
	fuel cell, 10 kg hydrogen gaseous storage and dedicated controllers
	What is the level of innovation?
Alternative	Probably, there's already one (or several) solution to the problem available in the market, but:
solution	It doesn't solve the full problem
Solution	MIt is difficult to implement
	MIt is not commercially mature
	Mit is expensive     Can you make a list of 3/4 products (or services) already available in the market that are trying
	to solve the same need as this KER? If possible, please provide a link to a reference website for
	further information.
	Tartier information.
	No alternative solutions were identified at this stage.
	Has your company (or someone in the consortium) already developed a solution for the
	identified need before this project started?
	• ⊠No
	Can we say that this solution is the starting point of the current project development activities?
	• ⊠No
"Market" -	Who are the potential early customers for this KER? Please make sure they reflect your choices
Early	in the Need/Problem section (e.g. type of customer, geography)
Adopters	⊠Private Small or medium enterprises
•	⊠Private Large enterprises
	Non-profit organizations
	MResearch and academic bodies
	■ Mesearch and academic bodies
	Please name a few potential customers:
	1. Industrial site
	2. Tertiary building
	Who are the potential final users?
	Industry:
	o ⊠One specific technical profile
	Non-profit organizations
	o ⊠One specific technical profile
	· · · · · · · · · · · · · · · · · · ·
	o ⊠One specific technical profile
	⊠Research and academic bodies
	o 🛮 One specific technical profile
	For the private company/companies, will this innovation be used by mainly current or new
	o ⊠One specific technical profile  For the private company/companies, will this innovation be used by mainly current or new customers?  • ⊠Current customers





Value	What are the activities (Custo	mer jobs) the custome	er usually performs, wi	here our KER would be	
proposition -	needed?	,000, 010 00001111		y can mand be	
Customer		es solar energy and inje			
profile		ses electricity from a su			
	What are the pains the custor				
		riods of higher consum		peak PV production to	
	What are the gains the custon			ties?	
		o reduce the energy bi			
	<ol><li>The customer has env</li></ol>	rironmental targets to a	ichieve.		
Value	CUSTOMER JOBS:	_			
proposition	Please confirm in which custo			ated and how much it	
	is relevant (refer to the activity	si <b>es identified in the pi</b> s the KER crucial to per			
		ntary to a core solution	•		
		is the KER crucial to pe			
		ntary to a core solution	•		
	CUSTOMER PAINS:	<u>,                                      </u>			
	What are the pains – among			reducing or avoiding	
	(refer to the pains identified i	n the previous section	)?		
	l. Customer does not ha	vo a moans to store elec	stricity during poak DV	production to consume	
				e KER is to address this	
	pain	gner consumption. To	vv. The objective of the	e relicio to address triis	
	CUSTOMER GAINS:				
	What are the gains – among		d – the KER can help a	achieving (refer to the	
	gains identified in the previou	ıs section)?			
	1 The customer wants	to radiuse the energy k	oill How? By using the	VED to maximize self	
		ity bills can be reduced		KER to maximize self-	
	2. The customer has env			the KER to maximize	
	self-consumption, the	carbon impact of elect	ricity consumption car	n be reduced	
"Market" –	What is the primary target ma	arket?			
Target	<ul> <li>■Heavy process Indus</li> </ul>	stry (energy intensive)			
market					
	⊠Real estate management				
	Please specify the most releva	ant sub-sector(s) of th	e KFD within the sele	cted market	
	Industrial sites	ant sub sector(s) or th	c KER, Within the Sele	ctca markea	
	The market targeted by this i	The market targeted by this innovation is:			
	■ Emerging: There is a growing demand and few offerings are available				
	Maykat dynamics is the maykat 2				
	Market dynamics: is the market?				
	Market competition: How stro	ong is competition in t	he target market?		
	⊠ Patchy, no major pla	ayers			
"Market" -	Please make a list of the co	mpetitors working in	n the same field (e.g.	. the manufacturers /	
Competitors	providers of the alternative so	olutions previously me	ntioned + others)		
	No competitors were identified	Lat this stage			
Go to Market	What are the relevant Busine		nuch are they applica	ble. For definition and	
- Business	examples of business models				
model		Scarcely		Very well	
	Business Model	applicable	Applicable	applicable	
	Bundling model		X		
	Razor blades model	X			
	Leasing model		X		
	Distribution model	X			
	Manufacturer model		X		
	Retailer model	X			
	Direct sales model	^	X		
	Pay as go model	X			
	Product as a service	X			
	1 1		l	1	





Go to Market - IPR Background	started) and that helped th	r type of Intellectual property already secured (before the pre e development of the solution. For definition and examples ne last pages of this document.	
	Туре	Owner	
	Patent		
	Trade secret		
	Copyright		
	Trademark		
Go to Market - IPR	Please check if the develope one (or more) type of Intelle	ed solution (within the end of the project) could be protected ctual property:	with
Foreground	Туре	Owners	
	Patent	X	
	Trade secret	X	
	Copyright		
	Trademark		

## 5.9.2 KER 10 international patent scenario overview

The query submitted to Patsnap, which revolved around the concepts of energy storage, hydrogen and fuel cells, revealed 812 INPADOC families.

## 5.9.2.1 Patenting trend

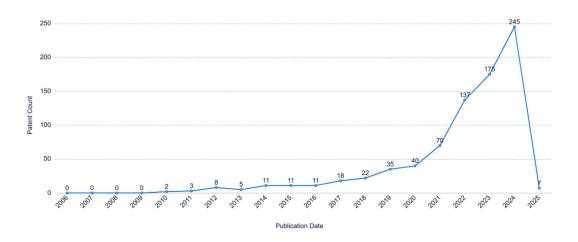


Figure 21. KER 10 - Patenting trend

The trend is clearly a growing one, with patent publications exponentially growing in the past years. This trend indicates that the market is in its initial stages, where a lot of R&D is performed.





#### 5.9.2.2 Top IPCs

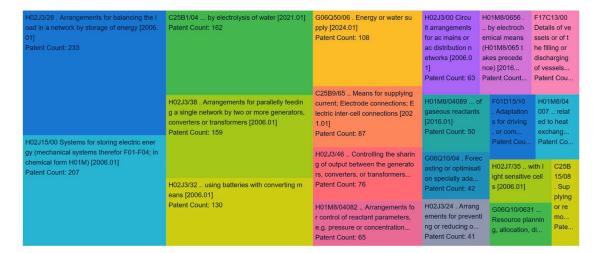


Figure 22. KER 10 - Top IPCs

The majority of patents is part of the IPC subclasses H02J "Circuit arrangements or systems for supplying or distributing electric power; systems for storing electric energy" and C25B "Electrolytic or electrophoretic processes for the production of compounds or non- metals; apparatus therefor".

#### 5.9.2.3 Top authorities

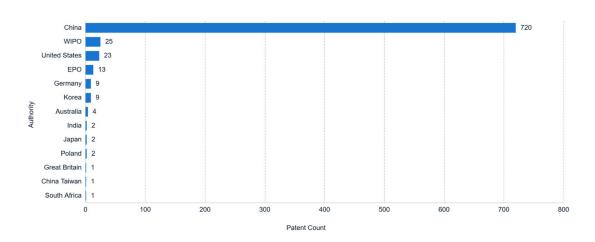


Figure 23. KER 10 - Top authorities

Similar to KER 8, China is by far the country where the most patent applications are submitted. US, WIPO and EPO patents are top authorities after China.





# 5.9.2.4 Top assignees



Figure 24. KER 10 - Top assignees

As usual for novel technologies, universities and research institutes represent most patent applications. Excluding the State Grid Corporation of China, the top assignees are all universities and research centers.





# 5.10 KER 11: Decentralized DHW preparation solution "enerbox"

# 5.10.1 KER 11 Characterization Table

#### Table 13. KER 11 - Characterization Table

Name of the	KER: Decentralized DHW preparation solution "enerbox"
Involved part	
KER Leader(s	
Problem	Is this:
/need	■    ■    A technical need. Please detail (e.g. higher performance, longer duration, different features,
	different standards) - Thermal flexibility, Use or RES
	• 🛮 🛮 🖎 A sustainability need. Please detail (e.g. lower consumption, lower level of pollutants,
	different social impact) - Use of RES
	Geographical level:
	SLocal /national
	Does the need come from:  • ⊠Private customers
	Machiners     Machiners     Machiners
December	What is the nature of the KER?
Description	
	New product  Please provide a description of the KER.
	The solution aims to provide temporal flexibility of heating and domestic hot water loads, while
	leading to the minimization peak demand and thermal loss, and thus, acting as a provider of load
	balancing services for the Austrian DH operator.
	The first variant of the system consists of a thermal storage tank for domestic hot water with a volume
	of 140 litres, which is installed in the heating system and the water supply of the building, and which
	is charged with heating water via a heat exchanger. The second variant is a thermal buffer tank with
	as volume of 510 m <sup>3</sup> , which is integrated directly into the district heating system and therefore can
	be charged directly via an inlet flow of supply water (without heat exchanger). In addition to the thermal charging of the storage tank, it is also possible for both variants to be charged via electric
	heating elements and electrical energy (0,5 kW DHW-tank/2050 kW buffer tank).
	What is the level of innovation?
	Innovative but could be difficult to convert customers
Alternative	
Alternative	■ Propably, there's already one (or several) solution to the problem available in the market, but:
solution	Probably, there's already one (or several) solution to the problem available in the market, but:  • ØOther (please specify)
	<ul> <li>         \understand Other (please specify)     </li> <li>Can you make a list of 3/4 products (or services) already available in the market that are trying to</li> </ul>
	<ul> <li>         \understand Other (please specify)     </li> <li>Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for</li> </ul>
	<ul> <li>         \understand Other (please specify)     </li> <li>Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.     </li> </ul>
	<ul> <li>         \understand Other (please specify)     </li> <li>Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.     </li> <li>No alternative solutions were identified at this stage.</li> </ul>
	<ul> <li>         \understand Other (please specify)     </li> <li>Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.     </li> <li>No alternative solutions were identified at this stage.</li> <li>Has your company (or someone in the consortium) already developed a solution for the identified</li> </ul>
	<ul> <li>         \understand Other (please specify)     </li> <li>Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.     </li> <li>         No alternative solutions were identified at this stage.     </li> <li>Has your company (or someone in the consortium) already developed a solution for the identified need before this project started?     </li> </ul>
	<ul> <li>         \understand Other (please specify)     </li> <li>Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.     </li> <li>         No alternative solutions were identified at this stage.     </li> <li>Has your company (or someone in the consortium) already developed a solution for the identified need before this project started?         <ul> <li> \understand Yes</li> </ul> </li> </ul>
	<ul> <li>         \understand Other (please specify)     </li> <li>Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.     </li> <li>         No alternative solutions were identified at this stage.     </li> <li>Has your company (or someone in the consortium) already developed a solution for the identified need before this project started?     </li> </ul>
	<ul> <li>         \understand Other (please specify)     </li> <li>Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.     </li> <li>         No alternative solutions were identified at this stage.     </li> <li>Has your company (or someone in the consortium) already developed a solution for the identified need before this project started?         <ul> <li>\understand Yes</li> </ul> </li> <li>Can we say that this solution is the starting point of the current project development activities?</li> </ul>
	<ul> <li>MOther (please specify)</li> <li>Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.</li> <li>No alternative solutions were identified at this stage.</li> <li>Has your company (or someone in the consortium) already developed a solution for the identified need before this project started?         <ul> <li>MYes</li> </ul> </li> <li>Can we say that this solution is the starting point of the current project development activities?         <ul> <li>MYes</li> </ul> </li> <li>If "Yes" then please specify the product or service already developed ("the starting point").</li> <li>Standard buffer tank, decentralized DHW tank (space optimized), both without EVELIXIA services</li> </ul>
	<ul> <li>Mother (please specify)</li> <li>Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.</li> <li>No alternative solutions were identified at this stage.</li> <li>Has your company (or someone in the consortium) already developed a solution for the identified need before this project started?         <ul> <li>Myes</li> </ul> </li> <li>Can we say that this solution is the starting point of the current project development activities?         <ul> <li>Myes</li> </ul> </li> <li>If "Yes" then please specify the product or service already developed ("the starting point"). Standard buffer tank, decentralized DHW tank (space optimized), both without EVELIXIA services</li> <li>Let's compare the KER with what we already had in the consortium. What are the main advancements respect to the "starting point" (the initial solution available in the consortium)? If possible, please give numerical figures that can quantify advancements.</li> </ul>
	<ul> <li>Mother (please specify)</li> <li>Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.</li> <li>No alternative solutions were identified at this stage.</li> <li>Has your company (or someone in the consortium) already developed a solution for the identified need before this project started?         <ul> <li>Myes</li> </ul> </li> <li>Can we say that this solution is the starting point of the current project development activities?         <ul> <li>Myes</li> </ul> </li> <li>If "Yes" then please specify the product or service already developed ("the starting point"). Standard buffer tank, decentralized DHW tank (space optimized), both without EVELIXIA services</li> <li>Let's compare the KER with what we already had in the consortium. What are the main advancements respect to the "starting point" (the initial solution available in the consortium)? If possible, please give numerical figures that can quantify advancements.</li> <li>MImproved flexibility for diverse applications</li> </ul>
	<ul> <li>Other (please specify)</li> <li>Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.</li> <li>No alternative solutions were identified at this stage.</li> <li>Has your company (or someone in the consortium) already developed a solution for the identified need before this project started? <ul> <li></li></ul></li></ul>
solution	
solution	
"Market" –	<ul> <li></li></ul>
solution	■
"Market" –	
"Market" –	■





	Example 1: I buy a car: I am the customer AND the user
	Example 2: I buy a toy for my kids: I am the customer, my kids are the users
	Example 3: My company buys a new SCADA system: the procurement office is the buyer, the
	employees and technicians are the users
	Who are the potential early customers for this KER? Please make sure they reflect your choices
	in the Need/Problem section (e.g. type of customer, geography)
	⊠Private Small or medium enterprises
	⊠Public bodies / authorities
	Please name a few potential customers:
	1. Construction companies
	District heating suppliers
	3. Housing companies
	Who are the potential final users?
	⊠Individuals
	Private Small or medium enterprises - > (See above)
	1 Thate small of median enterprises (see above)
	For the private company/companies, will this innovation be used by mainly current or new
	customers?
	⊠Current customers
	New customers
Value	What are the activities (Customer jobs) the customer usually performs, where our KER would be
proposition	needed?
- Customer	1. The customer has to install an energy supply system with low cost
profile	2. The customer has to install a flexible energy supply system
prome	3. The customer has to provide reliable/stable energy supply system
	What are the pains the customer encounters while doing the previous activities?
	The customer does not have a precise knowledge of suitable technologies
	The customer has possibility of designing the technology appropriately
	3. The customer has no detailed knowledge of the energy system has to be operated
	What are the gains the customer aims at, while doing the previous activities?
	The customer has to provide reliable energy
	l 2. The customer has to provide energy with a high level of comfort
	1 33 3
Value	, , , , , , , , , , , , , , , , , , , ,
Value proposition	3. The customer has to provide cost-effectively energy
	3. The customer has to provide cost-effectively energy  CUSTOMER JOBS:
	The customer has to provide cost-effectively energy  CUSTOMER JOBS:  Please confirm in which customer activity/process the KER can be integrated and how much it
	3. The customer has to provide cost-effectively energy  CUSTOMER JOBS:  Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):
	<ul> <li>The customer has to provide cost-effectively energy</li> <li>CUSTOMER JOBS:         Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):         <ul> <li>Activity 1: How much is the KER crucial to perform the activity?</li> <li>Mice to have</li> </ul> </li> </ul>
	<ul> <li>3. The customer has to provide cost-effectively energy</li> <li>CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section): <ul> <li>Activity 1: How much is the KER crucial to perform the activity?</li> <li>Mice to have</li> <li>Activity 2: How much is the KER crucial to perform the activity?</li> </ul> </li> </ul>
	<ul> <li>The customer has to provide cost-effectively energy</li> <li>CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section): <ul> <li>Activity 1: How much is the KER crucial to perform the activity?</li> <li>Nice to have</li> <li>Activity 2: How much is the KER crucial to perform the activity?</li> <li>MCore, but needs to work in synergy with other components/processes</li> </ul> </li> </ul>
	3. The customer has to provide cost-effectively energy  CUSTOMER JOBS:  Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • Mice to have  • Activity 2: How much is the KER crucial to perform the activity?  • Macore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?
proposition	3. The customer has to provide cost-effectively energy  CUSTOMER JOBS:  Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):
proposition	3. The customer has to provide cost-effectively energy  CUSTOMER JOBS:  Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • Mice to have  • Activity 2: How much is the KER crucial to perform the activity?  • More, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Mice to have  What is the primary target market?
proposition  "Market" –  Target	3. The customer has to provide cost-effectively energy  CUSTOMER JOBS:  Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):
proposition	3. The customer has to provide cost-effectively energy  CUSTOMER JOBS:  Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • Mice to have  • Activity 2: How much is the KER crucial to perform the activity?  • Mactivity 3: How much is the KER crucial to perform the activity?  • Mice to have  What is the primary target market?  • Menergy production/distribution/consumption
proposition  "Market" –  Target	3. The customer has to provide cost-effectively energy  CUSTOMER JOBS:  Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • Mice to have  • Activity 2: How much is the KER crucial to perform the activity?  • Mactivity 3: How much is the KER crucial to perform the activity?  • Mice to have  What is the primary target market?  • Menergy production/distribution/consumption  Please specify the most relevant sub-sector(s) of the KER, within the selected market:
proposition  "Market" –  Target	3. The customer has to provide cost-effectively energy  CUSTOMER JOBS:  Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • Mice to have  • Activity 2: How much is the KER crucial to perform the activity?  • Mactivity 3: How much is the KER crucial to perform the activity?  • Mice to have  What is the primary target market?  • Menergy production/distribution/consumption
proposition  "Market" –  Target	3. The customer has to provide cost-effectively energy  CUSTOMER JOBS:  Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • Nice to have  • Activity 2: How much is the KER crucial to perform the activity?  • More to have the KER crucial to perform the activity?  • More to have the KER crucial to perform the activity?  • More to have  What is the primary target market?  • Menergy production/distribution/consumption  Please specify the most relevant sub-sector(s) of the KER, within the selected market:  District heating, Housing companies, Construction companies
proposition  "Market" –  Target	3. The customer has to provide cost-effectively energy  CUSTOMER JOBS:  Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • Nice to have  • Activity 2: How much is the KER crucial to perform the activity?  • More to have work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Nice to have  What is the primary target market?  • Menergy production/distribution/consumption  Please specify the most relevant sub-sector(s) of the KER, within the selected market:  District heating, Housing companies, Construction companies  The market targeted by this innovation is:
proposition  "Market" –  Target	3. The customer has to provide cost-effectively energy  CUSTOMER JOBS:  Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • Nice to have  • Activity 2: How much is the KER crucial to perform the activity?  • More to have much is the KER crucial to perform the activity?  • More to have  What is the primary target market?  • Menergy production/distribution/consumption  Please specify the most relevant sub-sector(s) of the KER, within the selected market:  District heating, Housing companies, Construction companies  The market targeted by this innovation is:  • Mature: The market is already supplied with many products (services, processes,) of the
proposition  "Market" –  Target	3. The customer has to provide cost-effectively energy  CUSTOMER JOBS:  Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • Nice to have  • Activity 2: How much is the KER crucial to perform the activity?  • More to have work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Nice to have  What is the primary target market?  • Menergy production/distribution/consumption  Please specify the most relevant sub-sector(s) of the KER, within the selected market:  District heating, Housing companies, Construction companies  The market targeted by this innovation is:
proposition  "Market" –  Target	3. The customer has to provide cost-effectively energy  CUSTOMER JOBS:  Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • Nice to have  • Activity 2: How much is the KER crucial to perform the activity?  • More to have much is the KER crucial to perform the activity?  • More to have  What is the primary target market?  • Menergy production/distribution/consumption  Please specify the most relevant sub-sector(s) of the KER, within the selected market:  District heating, Housing companies, Construction companies  The market targeted by this innovation is:  • Mature: The market is already supplied with many products (services, processes,) of the
proposition  "Market" –  Target	3. The customer has to provide cost-effectively energy  CUSTOMER JOBS:  Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • ⊠Nice to have  • Activity 2: How much is the KER crucial to perform the activity?  • ⊠Core, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • ⊠Nice to have  What is the primary target market?  • ⊠Energy production/distribution/consumption  Please specify the most relevant sub-sector(s) of the KER, within the selected market:  District heating, Housing companies, Construction companies  The market targeted by this innovation is:  • ☑ Mature: The market is already supplied with many products (services, processes,) of the type proposed
proposition  "Market" –  Target	3. The customer has to provide cost-effectively energy  CUSTOMER JOBS:  Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • Nice to have  • Activity 2: How much is the KER crucial to perform the activity?  • Moreofe, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Nice to have  What is the primary target market?  • Menergy production/distribution/consumption  Please specify the most relevant sub-sector(s) of the KER, within the selected market:  District heating, Housing companies, Construction companies  The market targeted by this innovation is:  • Mature: The market is already supplied with many products (services, processes,) of the type proposed  Market dynamics: is the market?
proposition  "Market" –  Target	3. The customer has to provide cost-effectively energy  CUSTOMER JOBS:  Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • Nice to have  • Activity 2: How much is the KER crucial to perform the activity?  • Moreofe, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Nice to have  What is the primary target market?  • Menergy production/distribution/consumption  Please specify the most relevant sub-sector(s) of the KER, within the selected market:  District heating, Housing companies, Construction companies  The market targeted by this innovation is:  • Mature: The market is already supplied with many products (services, processes,) of the type proposed  Market dynamics: is the market?
proposition  "Market" –  Target	3. The customer has to provide cost-effectively energy  CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • Mice to have  • Activity 2: How much is the KER crucial to perform the activity?  • Mice to have much is the KER crucial to perform the activity?  • Mice to have  What is the primary target market?  • Menergy production/distribution/consumption  Please specify the most relevant sub-sector(s) of the KER, within the selected market: District heating, Housing companies, Construction companies  The market targeted by this innovation is:  • Mature: The market is already supplied with many products (services, processes,) of the type proposed  Market dynamics: is the market?  • Meloding steady
proposition  "Market" –  Target	3. The customer has to provide cost-effectively energy  CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • Mice to have  • Activity 2: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to
proposition  "Market" –  Target	3. The customer has to provide cost-effectively energy  CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • Mice to have  • Activity 2: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to
proposition  "Market" –  Target	3. The customer has to provide cost-effectively energy  CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • Mice to have  • Activity 2: How much is the KER crucial to perform the activity?  • Mactivity 3: How much is the KER crucial to perform the activity?  • Mice to have  • Activity 3: How much is the KER crucial to perform the activity?  • Mice to have  What is the primary target market?  • Menergy production/distribution/consumption  Please specify the most relevant sub-sector(s) of the KER, within the selected market:  District heating, Housing companies, Construction companies  The market targeted by this innovation is:  • Mature: The market is already supplied with many products (services, processes,) of the type proposed  Market dynamics: is the market?  • Meloding steady  Are there other markets for this innovation that the innovators are not yet targeting?  • Mo
proposition  "Market" –  Target	3. The customer has to provide cost-effectively energy  CUSTOMER JOBS:  Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • Nice to have  • Activity 2: How much is the KER crucial to perform the activity?  • Mocore, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Nice to have  What is the primary target market?  • Menergy production/distribution/consumption  Please specify the most relevant sub-sector(s) of the KER, within the selected market: District heating, Housing companies, Construction companies  The market targeted by this innovation is:  • Mature: The market is already supplied with many products (services, processes,) of the type proposed  Market dynamics: is the market?  • Melding steady  Are there other markets for this innovation that the innovators are not yet targeting?  • Mo  Market competition: How strong is competition in the target market?  • Me Established competition but none with a proposition like the one under investigation
"Market" – Target market	The customer has to provide cost-effectively energy  CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):
"Market" - Target market	The customer has to provide cost-effectively energy  CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity ]: How much is the KER crucial to perform the activity?  • Moice to have  • Activity 2: How much is the KER crucial to perform the activity?  • More, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • Moice to have  What is the primary target market?  • Menergy production/distribution/consumption  Please specify the most relevant sub-sector(s) of the KER, within the selected market: District heating, Housing companies, Construction companies  The market targeted by this innovation is:  • Mature: The market is already supplied with many products (services, processes,) of the type proposed  Market dynamics: is the market?  • Melding steady  Are there other markets for this innovation that the innovators are not yet targeting?  • Moin No  Market competition: How strong is competition in the target market?  • Melding steady  Please make a list of the competitors working in the same field (e.g. the manufacturers /
"Market" – Target market	The customer has to provide cost-effectively energy  CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • ⊠Nice to have  • Activity 2: How much is the KER crucial to perform the activity?  • ©Core, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • ©Nice to have  What is the primary target market?  • ©Energy production/distribution/consumption  Please specify the most relevant sub-sector(s) of the KER, within the selected market:  District heating, Housing companies, Construction companies  The market targeted by this innovation is:  • © Mature: The market is already supplied with many products (services, processes,) of the type proposed  Market dynamics: is the market?  • © Holding steady  Are there other markets for this innovation that the innovators are not yet targeting?  • © No  Market competition: How strong is competition in the target market?  • © Established competition but none with a proposition like the one under investigation  • © Several major players with strong competencies, infrastructure and offerings  Please make a list of the competitors working in the same field (e.g. the manufacturers / providers of the alternative solutions previously mentioned + others)
"Market" - Target market	The customer has to provide cost-effectively energy  CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1: How much is the KER crucial to perform the activity?  • ⊠Nice to have  • Activity 2: How much is the KER crucial to perform the activity?  • ©Core, but needs to work in synergy with other components/processes  • Activity 3: How much is the KER crucial to perform the activity?  • ©Nice to have  What is the primary target market?  • ©Energy production/distribution/consumption  Please specify the most relevant sub-sector(s) of the KER, within the selected market:  District heating, Housing companies, Construction companies  The market targeted by this innovation is:  • © Mature: The market is already supplied with many products (services, processes,) of the type proposed  Market dynamics: is the market?  • © Holding steady  Are there other markets for this innovation that the innovators are not yet targeting?  • © No  Market competition: How strong is competition in the target market?  • © Established competition but none with a proposition like the one under investigation  • © Several major players with strong competencies, infrastructure and offerings  Please make a list of the competitors working in the same field (e.g. the manufacturers / providers of the alternative solutions previously mentioned + others)





<ol><li>LAM industrie</li></ol>	es		
What are the relevant Business models and how much are they applicable. For definition and examples of business models, please refer to the last pages of this document.			
Business Model	Scarcely applicable	Applicable	Very well applicable
ESCO - energy performance contract	×		
Franchise model			
Distribution model	X		
Manufacturer model			×
Retailer model	X		
Direct sales model	Х		
		() () () () () () () () () () () () () (	
	•		
1. Contacting p	otential customers and	IS introduction	
2. Use of IS after	r product inquiries by cu	ıstomers	
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# 5.10.2 KER 11 international patent scenario overview

The query submitted to Patsnap, which revolved around the concepts of thermal storage tanks and heating systems, revealed 295 INPADOC families.





## 5.10.2.1 Patenting trend

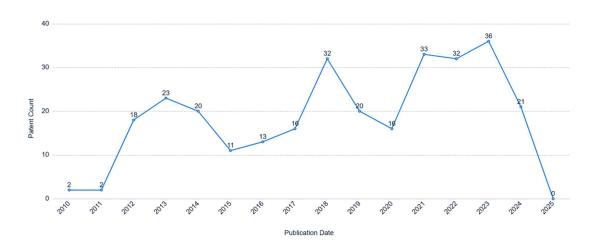


Figure 25. KER 11 - Patenting trend

The trend is slightly growing, but it is plausible to assume that it will soon reach a plateau, indicating a mature market.

#### 5.10.2.2 Top IPCs

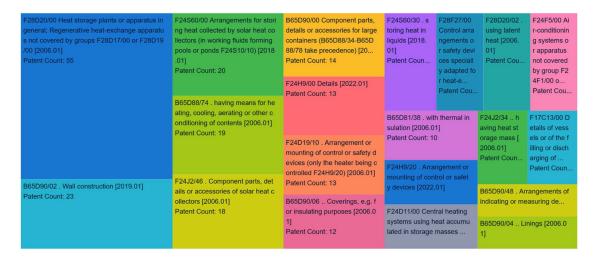


Figure 26. KER 11 - Top IPCs

The majority of patents is part of the IPC subclass F28D "heat-exchange apparatus, not provided for in another subclass, in which the heat-exchange media do not come into direct contact; heat storage plants or apparatus in general".





## 5.10.2.3 Top authorities

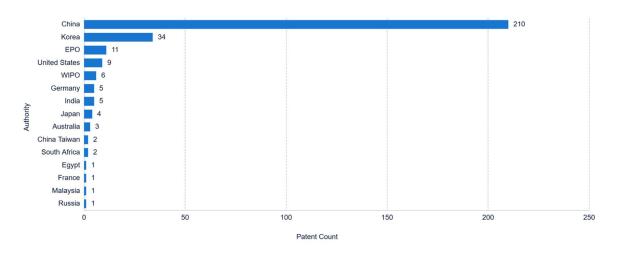


Figure 27. KER 11 - Top authorities

Like KER 8 and 10, China is by far the country where the most patent applications are submitted. Korea is a very relevant country in research related to this technology (34 patent applications).

5.10.2.4 Top assignees



Figure 28. KER 11 - Top assignees

From the graph, it appears that there is not a single dominant player in the market, as many companies applied for 4+ patents (with the maximum being 8). The top assignees are companies (instead of universities and research centers, which can be expected in more mature markets such this one.





# 5.11 KER 12: Building Aggregator Service (BAS)

# 5.11.1 KER 12 Characterization Table

**Table 14. KER 12 - Characterization Table** 

Name of the K	ER: Building Aggregator Service
	ners: Neogrid, Sustain, SALUS, Aabenraa DH, European Green Cities
KER Leader(s)	
Problem	Is this:
/need	• 🛮 🛮 🖎 financial/cost need. Please detail (e.g. lower CAPEX or OPEX, lower price, faster return on
	investment) - <b>Lower OPEX</b>
	⊠A sustainability need. Please detail (e.g. lower consumption, lower level of pollutants,
	different social impact) - <b>Green image</b>
	Geographical level:
	<ul> <li>\( \subseteq \text{Local}, linked e.g. to climate zones or other specific local contexts (please specify) DSO/TSO</li> </ul>
	level
	Does the need come from:
	⊠Private customers  ———————————————————————————————————
	Business/industrial customers
Description	What is the nature of the KER?
	⊠New product
	New service (except consulting services)
	Please provide a description of the KER.
	An IT tool for monitoring and control of flexible energy resources within a local area supplied with
	electricity and district heating. The BAS can also optimize the operation of the devices according to various goals, such as maximized self-consumption, reduced peak load on grid etc.
	What is the level of innovation?
	Mobviously innovative and easily appreciated advantages to customers
Alternative	Probably, there's already one (or several) solution to the problem available in the market, but:
solution	Solution to the problem available in the market, but.      Solution to the problem available in the market, but.
Solution	Can you make a list of 3/4 products (or services) already available in the market that are trying
	to solve the same need as this KER? If possible, please provide a link to a reference website for
	further information.
	No alternative solutions were identified at this stage.
	Has your company (or someone in the consortium) already developed a solution for the identified
	need before this project started?
	• ⊠No
	Can we say that this solution is the starting point of the current project development activities?
	• No
	Who are the potential early customers for this KER? Please make sure they reflect your choices
	in the Need/Problem section (e.g. type of customer, geography)
	MAssociations of individuals
	⊠Private Small or medium enterprises     — - · · · · · · · · · · · · · · · ·
	⊠Private Large enterprises
	Please name a few potential customers:
	Priease name a rew potential customers:     Private and Social housing associations
	2. IT solution provider for the energy sector
	Who are the potential final users?
	MIndividuals
	Individuals     Individuals
	o ⊠One specific technical profile
	o ⊠Individuals
	- Enrandado
	For the private company/companies, will this innovation be used by mainly current or new
	customers?
	⊠Current customers
	Mew customers
Value	
Value proposition -	MNew customers  What are the activities (Customer jobs) the customer usually performs, where our KER would be needed?
	What are the activities (Customer jobs) the customer usually performs, where our KER would be





	What are the pains the custor	ner encounters while d	oing the previous activ	/ities?
		view on operating status		
		e energy bill and operate		
	What are the gains the custor		g the previous activitie	s?
	<ol> <li>Easier operation, alarm</li> <li>Lower energy cost</li> </ol>	ns on bad operation		
Value	33			
Value proposition	CUSTOMER JOBS: Please confirm in which custo		as VED can be integrat	ad and have moved it
proposition	is relevant (refer to the activit			ed and now much it
		s the KER crucial to perfo		
	_	ntary to a core solution	of the activity:	
	•	s the KER crucial to perf	orm the activity?	
		ntary to a core solution	on the delivity.	
	CUSTOMER PAINS:	intary to a core solution		
	What are the pains – among th	ose previously listed – t	he KER can help reduc	ing or avoiding (refer
	to the pains identified in the p		<b>,</b>	
		•		
	<ol> <li>Easy overview and war</li> </ol>	rning. How? Reporting a	nd alarm	
		many energy markets. H	ow? Part of platform	
	CUSTOMER GAINS:			
	What are the gains - among		- the KER can help ac	hieving (refer to the
	gains identified in the previou	s section)?		
	1. Same as 1) in pains	O Hain a platfarma ta a ati	unta flavilailitu	
UN 4 I		/? Using platform to acti	vate nexibility	
"Market" -	What is the primary target ma			
Target market		listribution/consumptior	1	
market	⊠Real estate manager	ment		
	The market targeted by this ir	povation is:		
		a growing demand and f	ow offerings are availab	Jo
	■ Macineiging. There is a	a growing demand and i	ew onemigs are availab	ile .
	Market dynamics: is the mark	et?		
	2 2 Clowing			
	Are there other markets for th	is innovation that the i	nnovators are not yet t	targeting?
	<ul><li>■ Yes</li></ul>		_	
	Market competition: How stro	ng is competition in th	e target market?	
		ayers		
"Market" -	Patchy, no major pla  Please make a list of the co	ayers  mpetitors working in	the same field (e.g. t	the manufacturers /
"Market" - Competitors	<ul> <li></li></ul>	ayers  mpetitors working in	the same field (e.g. t	the manufacturers /
		ayers ompetitors working in olutions previously men	the same field (e.g. t	the manufacturers /
Competitors		ayers ompetitors working in olutions previously men onheat portfolio	the same field (e.g. t tioned + others)	
Competitors  Go to Market	Please make a list of the coproviders of the alternative so     Large enterprises:	ayers competitors working in clutions previously men cheat portfolio css models and how me	the same field (e.g. t tioned + others) uch are they applicabl	e. For definition and
Competitors  Go to Market - Business		ayers competitors working in clutions previously men cheat portfolio css models and how me	the same field (e.g. t tioned + others) uch are they applicabl	e. For definition and nt.
Competitors  Go to Market	Please make a list of the coproviders of the alternative so     Large enterprises:	ayers competitors working in clutions previously men cheat portfolio css models and how me	the same field (e.g. t tioned + others) uch are they applicabl	e. For definition and nt. Very well
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Competitors  Go to Market - Business	Please make a list of the coproviders of the alternative so     Large enterprises:         1. Danfoss' Lear  What are the relevant Busine examples of business models,  Business Model  Subscription model Freemium model  ESCO - energy performance	mpetitors working in plutions previously men wheat portfolio cass models and how me please refer to the last	the same field (e.g. t tioned + others) uch are they applicabl pages of this docume	e. For definition and nt. Very well applicable ×
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Competitors  Go to Market - Business	Please make a list of the coproviders of the alternative so Large enterprises:	mpetitors working in plutions previously men wheat portfolio cass models and how me please refer to the last	the same field (e.g. t tioned + others) uch are they applicabl pages of this docume	e. For definition and nt.  Very well applicable
Competitors  Go to Market  - Business	Patchy, no major pla  Please make a list of the co providers of the alternative so     Large enterprises:	mpetitors working in plutions previously men wheat portfolio cass models and how me please refer to the last	the same field (e.g. tioned + others)  uch are they applicable  Applicable	e. For definition and nt.  Very well applicable
Competitors  Go to Market  - Business	Please make a list of the coproviders of the alternative so Large enterprises:	mpetitors working in plutions previously men wheat portfolio cass models and how me please refer to the last	the same field (e.g. tioned + others)  uch are they applicable  Applicable	e. For definition and nt.  Very well applicable  X  X  X  X
Competitors  Go to Market - Business	Patchy, no major pla  Please make a list of the co providers of the alternative so     Large enterprises:         1. Danfoss' Lear  What are the relevant Busine examples of business models,  Business Model  Subscription model  Freemium model  ESCO - energy performance contract  Franchise model  Distribution model  Direct sales model  Data licensing model  Software as a service	mpetitors working in foliations previously men wheat portfolio ass models and how man please refer to the last Scarcely applicable	the same field (e.g. tioned + others)  uch are they applicable pages of this document Applicable	e. For definition and nt.  Very well applicable  X  X  X  X  X  X  X  X
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Go to Market - Business model  Go to Market	Please make a list of the coproviders of the alternative so Large enterprises:  1. Danfoss' Lear What are the relevant Busine examples of business models,  Business Model  Subscription model Freemium model ESCO - energy performance contract Franchise model Distribution model Distribution model Software as a service  Please make an initial high-leeproject, to make the solution to be managed in the Exploitation During the first monthal. Create a first	mpetitors working in solutions previously men wheat portfolio ass models and how many please refer to the last scarcely applicable wel description of the aready to market - TRL9 (on Checklist):  after the project: prototype ready for com	the same field (e.g. tioned + others)  uch are they applicable pages of this document Applicable  X  ctions to be performed ATTENTION! The detail	e. For definition and nt.  Very well applicable  X  X  X  X  X  A  A  A  A after the end of the
Go to Market - Business model  Go to Market	Please make a list of the coproviders of the alternative so Large enterprises:  1. Danfoss' Lear What are the relevant Busine examples of business models,  Business Model  Subscription model Freemium model ESCO - energy performance contract Franchise model Distribution model Direct sales model Data licensing model Software as a service  Please make an initial high-leproject, to make the solution to be managed in the Exploitation During the first month 1. Create a first Within 6 months after	propertions working in clutions previously men inheat portfolio in the propertion of the last scarcely applicable in the project: prototype ready for complex project: prototype prototype ready for complex project: prototype ready for complex prototype ready for complex project: prototype ready for complex prot	the same field (e.g. tioned + others)  uch are they applicable pages of this document Applicable  X  ctions to be performed ATTENTION! The detail	e. For definition and nt.  Very well applicable  X  X  X  X  X  A  A  A  A after the end of the
Go to Market - Business model  Go to Market	Please make a list of the coproviders of the alternative so Large enterprises:  1. Danfoss' Lear What are the relevant Busine examples of business models,  Business Model  Subscription model  Freemium model  ESCO - energy performance contract  Franchise model  Distribution model  Direct sales model  Data licensing model  Software as a service  Please make an initial high-leproject, to make the solution be managed in the Exploitation be managed in the Exploitation of the contract in the con	mpetitors working in plutions previously men wheat portfolio as models and how multiplease refer to the last scarcely applicable aready to market - TRL9 (on Checklist):  In after the project: prototype ready for com the project: rch	the same field (e.g. tioned + others)  uch are they applicable pages of this document Applicable  X  ctions to be performed ATTENTION! The detail	e. For definition and nt.  Very well applicable  X  X  X  X  X  A  A  A  A after the end of the
Go to Market - Business model  Go to Market	Please make a list of the coproviders of the alternative so Large enterprises:  1. Danfoss' Lear What are the relevant Busine examples of business models,  Business Model  Subscription model  Freemium model  ESCO - energy performance contract  Franchise model  Distribution model  Direct sales model  Data licensing model  Software as a service  Please make an initial high-lear project, to make the solution to managed in the Exploitation be managed in the Exploitation of the managed in the Exploitation	mpetitors working in plutions previously men wheat portfolio ass models and how many please refer to the last scarcely applicable wel description of the actedy to market - TRL9 (on Checklist):  In after the project:  prototype ready for come the project:  rthe project:	the same field (e.g. tioned + others)  uch are they applicable pages of this document Applicable   X  ctions to be performed ATTENTION! The detail mercial customers	e. For definition and nt.  Very well applicable  X  X  X  X  X  A  A  A  A after the end of the
Go to Market - Business model  Go to Market	Please make a list of the coproviders of the alternative so Large enterprises:  1. Danfoss' Lear What are the relevant Busine examples of business models,  Business Model  Subscription model Freemium model ESCO - energy performance contract Franchise model Distribution model Distribution model Direct sales model Data licensing model Software as a service  Please make an initial high-leproject, to make the solution be managed in the Exploitation  During the first month 1. Create a first Within 6 months after 1. Market resea Within 12 months after 1. Roll out comre	mpetitors working in plutions previously men wheat portfolio as models and how multiplease refer to the last scarcely applicable aready to market - TRL9 (on Checklist):  In after the project: prototype ready for com the project: rch	the same field (e.g. tioned + others)  uch are they applicable pages of this document of the pages of	e. For definition and nt.  Very well applicable  X  X  X  X  X  A  A  A  A after the end of the





	□ <u>Within 24 months</u> af 1. Decide on h	ter the project: now to sell and operate the solution	
Go to Market - IPR Background	started) and that helped th	r type of Intellectual property already secured (before the pre e development of the solution. For definition and examples he last pages of this document.	
	Type Patent Trade secret Copyright Trademark	Owner	
Go to Market - IPR Foreground	Please check if the develope one (or more) type of Intellect Type  Patent  Trade secret  Copyright  Trademark	ed solution (within the end of the project) could be protected ctual property:  Owners	with

# 5.12 KER 13: ESesoft Platform

### **5.12.1 KER 13 Characterization Table**

**Table 15. KER 13 - Characterization Table** 

Name of the K	ER: KERI3 ESEsoft Platform
Involved partn	
KER Leader(s):	ENTECH
Problem	Is this:
/need	<ul> <li>         \[             DA technical need. Please detail (e.g. higher performance, longer duration, different features, different standards) - Higher performance of storage system, longer duration of storage system, higher security performances, optimal dispatch of energy generation     \[             \text{DESTATE OF STATE OF ST</li></ul>
	<ul> <li>         □A financial/cost need. Please detail (e.g. lower CAPEX or OPEX, lower price, faster return on investment) - Lower LCOE (Levelized Cost of Electricity) of storage system     </li> </ul>
	<ul> <li>         □A sustainability need. Please detail (e.g. lower consumption, lower level of pollutants, different social impact) - High renewable energy self-consumption, possibly lower carbon emissions     </li> </ul>
	Geographical level:
	• \( \text{SGlobal} \)
	Does the need come from:
	Septimination of the second control of
- · ··	
Description	What is the nature of the KER?  ■ Significantly improved product
	<ul> <li>\( \sigma \) Significantly improved product</li> <li>\( \sigma \) Significantly improved service (except consulting services)</li> </ul>
•	Please provide a description of the KER.
	ESEsoft is ENTECH's proprietary existing generic cloud-based platform that brings together a set of features and modules to meet all of control, diagnostic, monitoring and management needs for
	power plants.  Specific ESEreg and ESEview solutions will be developed to control the H2 based long-duration storage system and to optimize functionality and interoperability between all components of the system.
	A new energy management system (comprising ESEmanage and ESEdiag) will be deployed to maximize the annual self-consumption ratio, while ensuring an optimal use of the storage system. ESEmanage will calculate optimal energy dispatch every ten minutes based on PV production, with an optimization algorithm running in the backend able to consider a multi-time scale energy management, adopting a model predictive control strategy for the long-term storage system. ESEdiag software will allow the supervision of assets to ensure that they function effectively.
	What is the level of innovation?
	■ ☑Very innovative
Alternative solution	Probably, there's already one (or several) solution to the problem available in the market, but: <ul> <li></li></ul>





- 🛮 It is not commercially mature
- 🛮 🛮 It is mature but not robust enough
- ⊠It is expensive

Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.

- Schneider Electric EcoStruxure Link: <u>EcoStruxure</u>: <u>IoT Internet des Objets Professionnels</u> [Schneider Electric France (se.com)
- 2. SMA Link: <u>SMA Commercial Storage Solution | SMA Solar</u>
- 3. Huawei Link: Micro-grid FusionSolar Global (huawei.com)

#### Can you find a main drawback or a limitation for each of the alternative solutions you provided?

- 1. Lack diagnostic and prognostic services for storage systems.
- 2. Platform not independent of SMA hardware systems, lack forecasting services
- 3. Lack dedicated services for EV load management and prognostic services for storage systems.

# Has your company (or someone in the consortium) already developed a solution for the identified need before this project started?

XYes

#### Can we say that this solution is the starting point of the current project development activities?

XIVes

#### If "Yes" then please specify the product or service already developed ("the starting point").

The solution is based on existing ENTECH's proprietary ESEsoft generic platform which brings together a set of features and modules.

Existing modules includes first version of ESEreg (which manages all real-time communication with the equipment and acts as the Power Management System) and ESEview (local SCADA system).

Let's compare the KER with what we already had in the consortium. What are the main advancements respect to the "starting point" (the initial solution available in the consortium)? If possible, please give numerical figures that can quantify advancements.

- Increased lifetime and or robustness
- Improved flexibility for diverse applications
- Improved technical performances (please specify) higher performance of hybrid H2-based storage system used.
- 🛮 Improved design, size, weight, efficiency, materials
- New features
- Improved user friendliness
- ⊠Remote operability
- Improved interoperability
- Improved safety
- Improved maintenance plan
- Improved environmental impact

Let's make some comparison with the benchmark. What are the main advancements respect to the alternative solutions (A, B, C, D) you have previously identified? If possible, please give numerical figures that can quantify advancements.

#### Alternative solution A

- Increased lifetime and or robustness
- Improved technical performances (please specify) Implementation of a multi time scale EMS strategy taking into account performances of hybrid storage system
- Improved design, size, weight, efficiency, materials
- Improved safety
- Improved maintenance plan

#### Alternative solution B

- Increased lifetime and or robustness
- Improved flexibility for diverse applications
- ⊠Improved technical performances (please specify)
- ⊠Improved design, size, weight, efficiency, materials
- ⊠Remote operability
- Improved interoperability
- Improved safety
- Improved maintenance plan

#### Alternative solution C

- Increased lifetime and or robustness
- Improved technical performances (please specify)
- ▶ ☑Improved design, size, weight, efficiency, materials
- Improved safety
- Improved maintenance plan





	utility nodes Fullded by the European Union
"Market" -	Who are the potential early customers for this KER? Please make sure they reflect your choices
Early	in the Need/Problem section (e.g. type of customer, geography)
Adopters	⊠Private Small or medium enterprises
	⊠Private Large enterprises
	Non-profit organizations
	⊠Public bodies / authorities
	⊠Research and academic bodies
	Please name a few potential customers:
	1. Industrial site
	2. Tertiary building
	Who are the potential final users?
	Industry:
	o ⊠One or several managers
	o ⊠One specific technical profile
	Non-profit organizations
	o ⊠One or several managers
	· ·
	o ⊠One specific technical profile
	⊠Public bodies / authorities
	o ⊠One or several managers
	o ⊠One specific technical profile
	⊠Research and academic bodies
	o ⊠One or several managers
	o ⊠One specific technical profile
	о Morie specific tecriffical profile
	For the private company/companies, will this innovation be used by mainly current or nev
	customers?
	⊠Current customers
Value	What are the activities (Customer jobs) the customer usually performs, where our KER would be
proposition	needed?
- Customer	The customer monitors and manages energy consumption.
profile	The customer monitors and manages solar energy production
	What are the pains the customer encounters while doing the previous activities?
	1. The customer does not have a means to optimally manage and monitor self-consumption
	The customer does not have a means to optimize and monitor assets performances
	3. The customer does not have a tool for monitoring the overall performances of the energy
	•
	system.
	4. The customer does not have a tool to detect defaults and predict maintenance needs fo
	energy assets.
	What are the gains the customer aims at, while doing the previous activities?
	1. The customer wants to maximize self-consumption while reducing energy bills.
	<ol><li>The customer wants to improve lifetime duration of storage systems.</li></ol>
	3. The customer wants to minimize default risks by receiving notification on predictive
	maintenance.
	4. The customer has access to historical data and KPI reporting
Value	CUSTOMER JOBS:
proposition	Please confirm in which customer activity/process the KER can be integrated and how much i
	is relevant (refer to the activities identified in the previous section):
	Activity 1: How much is the KER crucial to perform the activity?
	SComplementary to a core solution
	Activity 2: How much is the KER crucial to perform the activity?
	SComplementary to a core solution
	CUSTOMER PAINS:
	What are the pains – among those previously listed – the KER can help reducing or avoiding (refe
	to the pains identified in the previous section)?
	1. The customer does not have a means to optimally manage and monitor self-consumption
	2. The customer does not have a means to optimize and monitor assets performances
	3. The customer does not have a tool for monitoring the overall performances of the energ
	system
	4. The customer does not have a tool to detect defaults and predict maintenance needs for
	energy assets.

What are the gains - among those previously listed - the KER can help achieving (refer to the

**CUSTOMER GAINS:** 

energy assets.

gains identified in the previous section)?





				1 11 11 0 0
"Market" – Target market	using the KER to m  2. The customer wan diagnostic and prog  3. The customer war maintenance. How'  4. The customer has a tool included in the what is the primary target  • ⊠Heavy process Inc.  • ⊠Manufacturing In.  • ⊠Real estate mana  Please specify the most rel Industrial sites  The market targeted by thi  • ⊠ Emerging: There  Market dynamics: is the market dynamics: is the market mana	market? dustry (energy intensive) dustry gement evant sub-sector(s) of the k s innovation is: is a growing demand and fe arket?	lectricity bills can be ion of storage system the KER less by receiving not diprognostic services KPI reporting. How?	reduced ms. How? By using the diffication on predictive included in the KER By using the reporting
	Market competition: How s	trong is competition in the	target market?	
	⊠ Several major pla	yers with strong competenc	ies, infrastructure and	d offerings
"Market" -	Please make a list of the	• • •	•	·
Competitors	providers of the alternative			•
	□ <u>SMEs</u> :			
	1. Elum ene	rgy		
	2. Sonnen			
	3. Victron en	ergy		
	□ <u>Large enterprises</u> : 1. Schneider	Floctric		
	i. schneider 2. SMA	Electric		
	3. Huawei			
Go to	What are the relevant Bus	iness models and how mu	ch are they applical	ble. For definition and
Market –	examples of business mode			
Business	·			Very well
model	Business Model	Scarcely applicable	Applicable	applicable
	Subscription model			applicable
	<u> </u>		Χ	аррисаріе
	Bundling model		Χ	аррисаріе
	Bundling model Freemium model		X X	аррисавіе
	Bundling model Freemium model Direct sales model		Χ	аррисаріе
	Bundling model Freemium model Direct sales model Data licensing model	X	X X X	аррисаріе
	Bundling model Freemium model Direct sales model Data licensing model Software as a service		X X	аррисаріе
Coto	Bundling model Freemium model Direct sales model Data licensing model Software as a service Product as a service	X	X X X	
Go to	Bundling model Freemium model Direct sales model Data licensing model Software as a service Product as a service Please check if there is any t	× ype of Intellectual property	X X X X	fore the project started)
Market – IPR	Bundling model Freemium model Direct sales model Data licensing model Software as a service Product as a service Please check if there is any tand that helped the development	X  ype of Intellectual property pment of the solution. For	X X X X	fore the project started)
	Bundling model Freemium model Direct sales model Data licensing model Software as a service Product as a service Please check if there is any tand that helped the developlease refer to the last pages	X  ype of Intellectual property pment of the solution. For	X X X X already secured (be	fore the project started)
Market – IPR	Bundling model Freemium model Direct sales model Data licensing model Software as a service Product as a service Please check if there is any tand that helped the development	X  ype of Intellectual property pment of the solution. For	X X X X	fore the project started)
Market – IPR	Bundling model Freemium model Direct sales model Data licensing model Software as a service Product as a service Please check if there is any tand that helped the developlease refer to the last pages	ype of Intellectual property pment of the solution. For s of this document.	X X X X already secured (be	fore the project started)
Market – IPR	Bundling model Freemium model Direct sales model Data licensing model Software as a service Product as a service Please check if there is any tand that helped the developlease refer to the last pages Type Patent Trade secret Copyright	ype of Intellectual property pment of the solution. For s of this document.	X X X X already secured (be	fore the project started)
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Market - IPR Background	Bundling model Freemium model Direct sales model Data licensing model Software as a service Product as a service Please check if there is any tand that helped the developlease refer to the last pages Type Patent Trade secret Copyright Trademark Please check if the develop	ype of Intellectual property pment of the solution. For s of this document.  X X x peed solution (within the en	X X X X already secured (be definition and exam	fore the project started) ples of IP instruments,
Market - IPR Background  Go to Market - IPR	Bundling model Freemium model Direct sales model Data licensing model Software as a service Product as a service Please check if there is any tand that helped the developlease refer to the last pages Type Patent Trade secret Copyright Trademark Please check if the developene (or more) type of Intelli	ype of Intellectual property pment of the solution. For s of this document.  X X x peed solution (within the en	X X X  already secured (be definition and exam  Owner	fore the project started) ples of IP instruments,
Market - IPR Background	Bundling model Freemium model Direct sales model Data licensing model Software as a service Product as a service Please check if there is any tand that helped the developlease refer to the last pages Type Patent Trade secret Copyright Trademark Please check if the developene (or more) type of Intellection	ype of Intellectual property pment of the solution. For s of this document.  X  X  x  peed solution (within the enectual property:	X X X X already secured (be definition and exam	fore the project started) ples of IP instruments,
Market - IPR Background  Go to Market - IPR	Bundling model Freemium model Direct sales model Data licensing model Software as a service Product as a service Please check if there is any tand that helped the developlease refer to the last pages Type Patent Trade secret Copyright Trademark Please check if the developene (or more) type of Intellettype Patent	ype of Intellectual property pment of the solution. For s of this document.  X  X  X  Deed solution (within the enectual property:  X	X X X  already secured (be definition and exam  Owner	fore the project started) ples of IP instruments,
Market - IPR Background  Go to Market - IPR	Bundling model Freemium model Direct sales model Data licensing model Software as a service Product as a service Please check if there is any tand that helped the developlease refer to the last pages Type Patent Trade secret Copyright Trademark Please check if the developene (or more) type of Intellections	ype of Intellectual property pment of the solution. For s of this document.  X  X  X  Deed solution (within the enectual property:  X  X	X X X  already secured (be definition and exam  Owner	fore the project started) ples of IP instruments,
Market - IPR Background  Go to Market - IPR	Bundling model Freemium model Direct sales model Data licensing model Software as a service Product as a service Please check if there is any tand that helped the developlease refer to the last pages Type Patent Trade secret Copyright Trademark Please check if the developene (or more) type of Intellettype Patent	ype of Intellectual property pment of the solution. For s of this document.  X  X  X  Deed solution (within the enectual property:  X	X X X  already secured (be definition and exam  Owner	fore the project started) ples of IP instruments,





# 5.13 KER 14: SRI Advisor tool

# 5.13.1 KER 14 Characterization Table

#### Table 16. KER 14 - Characterization Table

Name of the KER: SRI	Advisor tool
Involved partners: R2I	
KER Leader(s): R2M	
Problem /need	Is this:
	<ul> <li></li></ul>
	features, different standards) - Recommendations about smartness upgrades of
	technical building systems
	MA financial/cost need. Please detail (e.g. lower CAPEX or OPEX, lower price, faster return on investment of the cost of
	investment) - Evaluation of the costs (CAPEX and OPEX) of the recommended
	smartness upgrades Geographical level:
	Seuropean
	Does the need come from:
	Business/industrial customers
	⊠Public entities
Description	What is the nature of the KER?
	New product
	Please provide a description of the KER.
	The Smart Readiness Indicator Advisor will provide Building Owners and Managers with tailored
	recommendations on how to improve their SRI score (i.e., both the overall SRI score, score of key
	functionalities, and the score of the 7 SRI impact categories (e.g. energy efficiency, comfort, energy flexibility etc.). The tool will perform different sensitivity analyses based on possible technology
	renovation packages and/or different flexibility scenarios, with a view to determining the most cost-
	effective building upgrades to achieve a higher SRI score-performance.
	What is the level of innovation?
	Innovative but could be difficult to convert customers (at the beginning of the EVELIXIA)
	project, as the SRI is not broadly known)
	<ul> <li>MObviously innovative and easily appreciated advantages to customers (at the end of the</li> </ul>
	EVELIXIA project, as the SRI is progressively becoming a mandatory instrument)
Alternative solution	Probably, there's already one (or several) solution to the problem available in the market, but:
	If doesn't solve the full problem     If is not commercially mature
	It is not confine clary mature      It is mature but not robust enough
	Can you make a list of 3/4 products (or services) already available in the market that are trying
	to solve the same need as this KER? If possible, please provide a link to a reference website for
	further information.
	A. Ecopulse Masselin - Link: <a href="https://www.masselin-energie.fr/nos-savoir-faire/smart-">https://www.masselin-energie.fr/nos-savoir-faire/smart-</a>
	building/ecopulse/
	B. Audit Decret BACS Nextiim - Link: <a href="https://www.nextiim.com/metiers/audit-decret-bacs/">https://www.nextiim.com/metiers/audit-decret-bacs/</a> Can you find a main drawback or a limitation for each of the alternative solutions you provided?
	A. They help to do a BMS/BACS audit to define the efficiency class of BMS/BACS accordingly to
	the standard EN ISO 52120-1 and propose renovation measures to raise this efficiency class,
	but not the SRI class
	B. They help to do a BMS/BACS audit to define the efficiency class of BMS/BACS accordingly to
	the standard EN ISO 52120-1 and propose renovation measures to raise this efficiency class,
	but not the SRI class
	Has your company (or someone in the consortium) already developed a solution for the identified need before this project started?
	Identified need before this project started:
	Can we say that this solution is the starting point of the current project development activities?
	• No
	Let's make some comparison with the benchmark. What are the main advancements respect to
	the alternative solutions (A, B, C, D) you have previously identified? If possible, please give
	numerical figures that can quantify advancements.
	Alternative solution A
	⊠New features     Alternative solution B
	Atternative Solution D





	⊠New features
"Market" – <i>Early</i>	Who are the potential early customers for this KER? Please make sure they reflect your choices
Adopters	in the Need/Problem section (e.g. type of customer, geography)
7.00,010.0	⊠Private Small or medium enterprises
	⊠Private Large enterprises
	Public bodies / authorities
	est ablic bodies / dathornes
	Please name a few potential customers:
	1. GreenFlex
	2. Bureau Veritas
	3. Socotec
	Who are the potential final users?
	■ Industry:
	o 🛮 🖂 One or several managers
	o 🛮 🖂 One specific technical profile
	o 🛮 🖯 One specific department/team
	o ⊠One or several managers
	o ⊠One specific department/team
	⊠Research and academic bodies
	o ⊠One specific department/team
	o ⊠Students
	For the private company/companies, will this innovation be used by mainly current or new
	customers?
** I	New customers
Value proposition –	What are the activities (Customer jobs) the customer usually performs, where our KER would be
Customer profile	needed?  1. After conducting their audit, BMS/BEMS/BACS auditors propose improvement measures
	and design to increase the efficiency class of the BMS/BEMS/BACS and improve comfort
	and accompany it by a ROI calculation of these measures.
	2. Facility managers monitor and analyze costs and budgets for maintenance and service
	operations, do planning and implementation of facility renovation projects as well as
	management of equipment and installations (heating, air conditioning, electricity,
	plumbing, etc.).
	3. <b>Energy managers</b> manage energy efficiency projects, such as the installation of energy
	management systems or the implementation of energy-saving measures.
	What are the pains the customer encounters while doing the previous activities?
	<ol> <li>BMS/BEMS/BACS auditors have incomplete information about how to improve the BACS efficiency and smartness (SRI score) of their buildings and how much it would cost. The full</li> </ol>
	scope of the SRI (9 technical domains) is not addressed by current commercial tools.
	2. <b>Facility managers</b> and <b>Energy managers</b> don't know how to improve the energy efficiency
	and smartness (SRI score) of their buildings and how much it would cost.
	What are the gains the customer aims at, while doing the previous activities?
	1. Building use optimization
	2. Building use cost-effectiveness
	3. Renovation measures of BACS
	4. Reduce energy bills
	4. Reduce energy bills 5. Optimize comfort conditions for occupants
Value and the	<ul><li>4. Reduce energy bills</li><li>5. Optimize comfort conditions for occupants</li><li>6. Reduce technical building systems maintenance cost</li></ul>
Value proposition	<ul> <li>4. Reduce energy bills</li> <li>5. Optimize comfort conditions for occupants</li> <li>6. Reduce technical building systems maintenance cost</li> </ul> CUSTOMER JOBS:
Value proposition	<ul> <li>4. Reduce energy bills</li> <li>5. Optimize comfort conditions for occupants</li> <li>6. Reduce technical building systems maintenance cost</li> </ul> CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it
Value proposition	<ul> <li>4. Reduce energy bills</li> <li>5. Optimize comfort conditions for occupants</li> <li>6. Reduce technical building systems maintenance cost</li> <li>CUSTOMER JOBS:</li> <li>Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):</li> </ul>
Value proposition	<ul> <li>4. Reduce energy bills</li> <li>5. Optimize comfort conditions for occupants</li> <li>6. Reduce technical building systems maintenance cost</li> <li>CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):         <ul> <li>Activity 1 (BMS/BEMS/BACS audits): How much is the KER crucial to perform the activity?</li> </ul> </li> </ul>
Value proposition	<ul> <li>4. Reduce energy bills</li> <li>5. Optimize comfort conditions for occupants</li> <li>6. Reduce technical building systems maintenance cost</li> <li>CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):         <ul> <li>Activity 1 (BMS/BEMS/BACS audits): How much is the KER crucial to perform the activity?</li> <li></li></ul></li></ul>
Value proposition	<ul> <li>4. Reduce energy bills</li> <li>5. Optimize comfort conditions for occupants</li> <li>6. Reduce technical building systems maintenance cost</li> <li>CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):         <ul> <li>Activity 1 (BMS/BEMS/BACS audits): How much is the KER crucial to perform the activity?</li> </ul> </li> </ul>
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Value proposition	<ul> <li>4. Reduce energy bills</li> <li>5. Optimize comfort conditions for occupants</li> <li>6. Reduce technical building systems maintenance cost</li> <li>CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):         <ul> <li>Activity 1 (BMS/BEMS/BACS audits): How much is the KER crucial to perform the activity?</li> <li></li></ul></li></ul>
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Value proposition	<ul> <li>4. Reduce energy bills</li> <li>5. Optimize comfort conditions for occupants</li> <li>6. Reduce technical building systems maintenance cost</li> <li>CUSTOMER JOBS:</li> <li>Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section): <ul> <li>Activity 1 (BMS/BEMS/BACS audits): How much is the KER crucial to perform the activity?</li> <li>Activity 2 (Facility management): How much is the KER crucial to perform the activity?</li> <li>Activity 3 (Energy management): How much is the KER crucial to perform the activity?</li> <li>Activity 3 (Energy management): How much is the KER crucial to perform the activity?</li> <li>Activity 3 (Energy management): How much is the KER crucial to perform the activity?</li> <li>Activity 3 (Energy management): How much is the KER crucial to perform the activity?</li> </ul> </li> </ul>
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Value proposition	<ul> <li>4. Reduce energy bills</li> <li>5. Optimize comfort conditions for occupants</li> <li>6. Reduce technical building systems maintenance cost</li> <li>CUSTOMER JOBS: Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):         <ul> <li>Activity 1 (BMS/BEMS/BACS audits): How much is the KER crucial to perform the activity?</li> <li>Activity 2 (Facility management): How much is the KER crucial to perform the activity?</li> <li>Activity 3 (Energy management): How much is the KER crucial to perform the activity?</li> <li>Activity 3 (Energy management): How much is the KER crucial to perform the activity?</li> <li>Nice to have</li> </ul> </li> <li>CUSTOMER PAINS: What are the pains – among those previously listed – the KER can help reducing or avoiding (refer to the pains identified in the previous section)?</li> </ul>





	<b>How?</b> By providing tailore packages on how to level up			e technology upgrade
	CUSTOMER GAINS:			
	What are the gains – amon gains identified in the previ		d – the KER can help a	achieving (refer to the
	Renovation measures of BAC			
	<b>How?</b> By providing tailore packages on how to level up		ia most cost-enective	e technology upgrade
	Other gains are also address energy and reducing mainte			e SRI helps e.g., saving
"Market" – Target	What is the primary target			
market	⊠Real estate manage	gement		
	Please specify the most rele BACS audit, facility managen			cted market:
	The market targeted by this	s innovation is: is a growing demand and	l few offerings are avail:	able
			rew onernigo are avail	
	Market dynamics: is the ma  ■ ☑ Growing	rket?		
	• 🗷 Growing			
	Are there other markets for ■ No	this innovation that the	innovators are not ye	et targeting?
	Maylest aspensition, Have at		h a daward was alcad?	
	Market competition: How st  ■ ☑ Patchy, no major		ne target market?	
"Market" -	Please make a list of the		n the same field (e.g.	. the manufacturers /
Competitors	providers of the alternative	solutions previously me	ntioned + others)	
	€ <u>SMEs</u> : 1. Masselin E	nergie		
	2. Nextiim	9		
Go to Market –	What are the relevant Busi			
Go to Market – Business model	What are the relevant Busi examples of business mode		st pages of this docum	
	What are the relevant Busi examples of business mode Business Model	els, please refer to the la	st pages of this docum Applicable	nent.
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Business model  Go to Market -	What are the relevant Busi examples of business model  Business Model  Subscription model  Bundling model  Pay as go model  Software as a service  Please make an initial high-	Scarcely applicable  -level description of the n ready to market - TRL9 tion Checklist):	Applicable  X X X X actions to be performed	very well applicable applicable
Business model  Go to Market -	What are the relevant Busi examples of business mode  Business Model  Subscription model  Bundling model  Pay as go model  Software as a service  Please make an initial highproject, to make the solution be managed in the Exploita  € During the first more  1. List potent	Scarcely applicable  level description of the ready to market - TRL9 tion Checklist):  hth after the project: ial customers	Applicable  X X X X actions to be performe	very well applicable applicable
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Go to Market - Timing  Go to Market - IPR Background	What are the relevant Business mode  Business Model  Subscription model  Bundling model  Pay as go model  Software as a service  Please make an initial highproject, to make the solution be managed in the Exploita  € During the first more  1. List potent  2. Discuss the elevant with the point of the solution of the s	cls, please refer to the last Scarcely applicable  clevel description of the neady to market - TRL9 tion Checklist):  ath after the project:  ial customers business model ter the project:  the business model ation to potential users by type of Intellectual properties of the last pages of this document of the seed solution (within the last pages solution (within the last pages)	Applicable  X X X X actions to be performed (ATTENTION! The details)  roperty already secur solution. For definition iment.  Owner	very well applicable  ed after the end of the ailed list of actions will  red (before the project n and examples of IP
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# 5.14 KER 15: SRI Calculation Methodology at District Level

# 5.14.1 KER 15 Characterization Table

**Table 17: KER 15 - Characterization Table** 

Name of the KER: SRI	Calculation Methodology at District Level
Involved partners: R2	M, CERTH
KER Leader(s): R2M Problem /need	la Abia.
Problem /need	Is this:
	<ul> <li>MAll of them: Monitor the development of load shifting potentials and renewable integration in an area and thus assess critical conditions of energy infrastructure</li> </ul>
	through the estimation of SRI on a district scale
	Geographical level:
	Sea the most come from:
	Does the need come from:
	Business/industrial customers
Description	What is the nature of the KER?
	<ul> <li></li></ul>
	MOther (please specify): Significantly improved service for smartifying districts
	Please provide a description of the KER.
	The SRI methodology at district level will allow to quantify how much buildings can contribute to
	actively store and dispatch energy within a district or a larger urban quarter, by calculating the SR
	on a district scale for the seven Pilot Sites of EVELIXIA and will provide a coherent quantitative
	assessment based on the district's overall energy storage capacity, load shifting potential, its ability
	to actively interact with the energy grids and the resulting CO2 emission savings compared to a non-
	interactive system. The estimation of an SRIDist_Max for an area or the maximum Load shift potentia
	for the whole district (LPDist_Max) which the network infrastructure can endure and thus monitor
	the development of load shifting potentials and renewable integration in the area to be vigilant of
	potentially critical conditions related to the energy infrastructure will be included.
	What is the level of innovation?
	<ul> <li>MObviously innovative and easily appreciated advantages to customers (at the end of the</li> </ul>
	EVELIXIA project, as the SRI is progressively becoming a mandatory instrument)
Alternative solution	Probably, there's already one (or several) solution to the problem available in the market, but:
	⊠It is difficult to implement
	⊠It is not commercially mature
	Can you make a list of 3/4 products (or services) already available in the market that are trying
	Can you make a list of 3/4 products (or services) already available in the market that are trying
	Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.
	Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.  A. Urban Building Energy Modeling with the open-source City Energy Analyst (CEA) tool - Link
	Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.  A. Urban Building Energy Modeling with the open-source City Energy Analyst (CEA) tool - Link https://www.cityenergyanalyst.com/
	Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.  A. Urban Building Energy Modeling with the open-source City Energy Analyst (CEA) tool - Link <a href="https://www.cityenergyanalyst.com/">https://www.cityenergyanalyst.com/</a> B. CityCalc tool from CityCalc research project. Being a product from the portfolio of A-NULL
	Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.  A. Urban Building Energy Modeling with the open-source City Energy Analyst (CEA) tool - Link <a href="https://www.cityenergyanalyst.com/">https://www.cityenergyanalyst.com/</a> B. CityCalc tool from CityCalc research project. Being a product from the portfolio of A-NULL
	Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.  A. Urban Building Energy Modeling with the open-source City Energy Analyst (CEA) tool - Link https://www.cityenergyanalyst.com/  B. CityCalc tool from CityCalc research project. Being a product from the portfolio of A-NULL Development GmbH, AT is not more commercialized - Link https://nachhaltigwirtschaften.at/en/sdz/projects/citycalc-calculation-tool-for-energy-
	Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.  A. Urban Building Energy Modeling with the open-source City Energy Analyst (CEA) tool - Link https://www.cityenergyanalyst.com/  B. CityCalc tool from CityCalc research project. Being a product from the portfolio of A-NULL Development GmbH, AT is not more commercialized - Link https://nachhaltigwirtschaften.at/en/sdz/projects/citycalc-calculation-tool-for-energy-efficiency-in-urban-planning.php
	Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.  A. Urban Building Energy Modeling with the open-source City Energy Analyst (CEA) tool - Link https://www.cityenergyanalyst.com/  B. CityCalc tool from CityCalc research project. Being a product from the portfolio of A-NULL Development GmbH, AT is not more commercialized - Link https://nachhaltigwirtschaften.at/en/sdz/projects/citycalc-calculation-tool-for-energy-efficiency-in-urban-planning.php  C. 2 scientific publications: Supporting the Smart Readiness Indicator—A Methodology to
	Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.  A. Urban Building Energy Modeling with the open-source City Energy Analyst (CEA) tool - Link https://www.cityenergyanalyst.com/  B. CityCalc tool from CityCalc research project. Being a product from the portfolio of A-NULL Development GmbH, AT is not more commercialized - Link https://nachhaltigwirtschaften.at/en/sdz/projects/citycalc-calculation-tool-for-energy-efficiency-in-urban-planning.php  C. 2 scientific publications: Supporting the Smart Readiness Indicator—A Methodology to Integrate A Quantitative Assessment of the Load Shifting Potential of Smart Buildings - Link
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	Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.  A. Urban Building Energy Modeling with the open-source City Energy Analyst (CEA) tool - Link <a href="https://www.cityenergyanalyst.com/">https://www.cityenergyanalyst.com/</a> B. CityCalc tool from CityCalc research project. Being a product from the portfolio of A-NULL Development GmbH, AT is not more commercialized - Link <a href="https://nachhaltigwirtschaften.at/en/sdz/projects/citycalc-calculation-tool-for-energy-efficiency-in-urban-planning.php">https://nachhaltigwirtschaften.at/en/sdz/projects/citycalc-calculation-tool-for-energy-efficiency-in-urban-planning.php</a> C. 2 scientific publications: Supporting the Smart Readiness Indicator—A Methodology to Integrate A Quantitative Assessment of the Load Shifting Potential of Smart Buildings - Link <a href="https://www.mdpi.com/1996-1073/12/10/1955">https://www.mdpi.com/1996-1073/12/10/1955</a> + Extending the Application of the Smart Readiness Indicator—A Methodology for the Quantitative Assessment of the Load Shifting
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	Can you make a list of 3/4 products (or services) already available in the market that are trying to solve the same need as this KER? If possible, please provide a link to a reference website for further information.  A. Urban Building Energy Modeling with the open-source City Energy Analyst (CEA) tool - Link https://www.cityenergyanalyst.com/  B. CityCalc tool from CityCalc research project. Being a product from the portfolio of A-NULL Development GmbH, AT is not more commercialized - Link https://nachhaltigwirtschaften.at/en/sdz/projects/citycalc-calculation-tool-for-energy-efficiency-in-urban-planning.php  C. 2 scientific publications: Supporting the Smart Readiness Indicator—A Methodology to Integrate A Quantitative Assessment of the Load Shifting Potential of Smart Buildings - Link: https://www.mdpi.com/1996-1073/12/10/1955 + Extending the Application of the Smart Readiness Indicator—A Methodology for the Quantitative Assessment of the Load Shifting Potential of Smart Districts - Link: https://www.mdpi.com/1996-1073/13/13/3507  Can you find a main drawback or a limitation for each of the alternative solutions you provided?  A. XXXX  B. XXXX  C. It is not based on actual definition of the SRI: in these publications it is based on assumptions that the SRI is calculated per grid type (SRI electrical, SRI thermal and SRI gas) and it depends from an activity coefficient (if this coef =1, so the SRI is between 0 and 1, if this coef =2, so the SRI is between 0 and 2)  Has your company (or someone in the consortium) already developed a solution for the identified need before this project started?





	Let's make some comparison with the benchmark. What are the main advancements respect to the alternative solutions (A, B, C, D) you have previously identified? If possible, please givenumerical figures that can quantify advancements.  Alternative solution A				
	Alternative solution B				
	⊠New features				
	Alternative solution C				
"Market" – Early	MNew features  Who are the potential early customers for this KER? Please make sure they reflect your choices				
Adopters	in the Need/Problem section (e.g. type of customer, geography)				
	⊠Research and academic bodies				
	Please name a few potential customers:				
	<ol> <li>Energy utilities and operators: EDF (FR), ENGIE (FR), PPC (GR), HEDNO (GR) etc.</li> <li>Real estate and infrastructure developers: Skanska (SE), Bouygues Immobilier (FR) etc.</li> <li>National energy agencies: ADEME (FR), Danish Energy Agency (DK) etc.</li> </ol>				
	Who are the potential final users?				
	⊠Industry:				
	o 🛮 🛮 One or several managers				
	o ⊠One specific technical profile				
	o ⊠One specific department/team				
	⊠Public bodies / authorities				
	o Students				
	For the private company/companies, will this innovation be used by mainly current or new				
	customers?				
	New customers				
Value proposition –	What are the activities (Customer jobs) the customer usually performs, where our KER would be				
Customer profile	needed?  1. Energy infrastructure planning & policy development;				
	2. Feasibility studies & technical assessments;				
	3. System design & engineering;				
	4. Project implementation & management;				
	5. Digitalization & Smart energy systems;				
	6. Funding & investment advisory; 7. Community engagement & social impact.				
	What are the pains the customer encounters while doing the previous activities?				
	<ol> <li>Data availability issues (incomplete or outdated energy consumption data).</li> <li>Complexity in energy storage capacity, load shifting potential and the ability of buildings to interact with energy grids assessment due to non-existing data.</li> </ol>				
	<ol><li>Renewable systems integration challenges with existing energy infrastructure of districts and cities.</li></ol>				
	4. High initial costs of feasibility studies and assessments.				
	5. Availability and interoperability of smart and IoT devices +				
	What are the gains the customer aims at, while doing the previous activities?				
	Optimization of district and urban energy infrastructure planning (electricity, gas and beating and cooling naturally):				
	heating and cooling networks);  2. Clustering buildings with different thermal qualities and connected energy generation,				
	supply and storage systems;				
	<ol> <li>Aggregated energy management in clustered buildings (districts);</li> <li>Use of SRI for urban planning.</li> </ol>				
Value proposition	CUSTOMER JOBS:				
value proposition	Please confirm in which customer activity/process the KER can be integrated and how much it is relevant (refer to the activities identified in the previous section):  • Activity 1 (Energy infrastructure planning): How much is the KER crucial to perform the				
	activity?				
	<ul> <li>              \( \text{Scale}\) Core, but needs to work in synergy with other components/processes      </li> <li>             \( \text{Activity 2 (System design &amp; Engineering)}\): How much is the KER crucial to perform the activity?         </li> </ul>				
	<ul> <li>              \( \text{Scorp}\)   Complementary to a core solution      </li> <li>             \( \text{Activity 3 (Digitalization &amp; Smart Energy Systems)}\): How much is the KER crucial to perform the activity?     </li> </ul>				





	50 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							
	MCore, but needs to work in synergy with other components/processes							
		CUSTOMER PAINS:  What are the pains – among those previously listed – the KER can help reducing or avoiding						
				KER Call Help red	deling of avoiding			
	(refer to the panis facility	(refer to the pains identified in the previous section)?						
	For all activities: Complexity in energy storage capacity, load shifting potential and the ability of							
	buildings to interact with energy grids assessment due to non-existing data AND renewable systems							
	integration challenges with existing energy infrastructure of districts and cities.							
	How? Dv ovaluating loa	d shifting notontia	ls of buildings r	anoviable integrati	on in an area and			
	<b>How?</b> By evaluating load shifting potentials of buildings, renewable integration in an area and assessing the SRI on a district scale.							
	CUSTOMER GAINS:	otrict scale.						
	What are the gains – an	nong those previo	usly listed - the I	KER can help achie	eving (refer to the			
	gains identified in the p	gains identified in the previous section)?						
	Optimization of district a			ning (electricity, ga	is and heating and			
	cooling networks) + Use of SRI for urban planning. <b>How?</b> By evaluating load shifting potentials of buildings, renewable integration in an area and							
	assessing the SRI on a di							
	scale can significantly enhance energy efficiency and user comfort while reducing operational costs.							
	The integration of smart							
	quality, and provide personalized comfort settings for occupants while accounting for grid requirements. Additionally, the SRI supports sustainability goals, helping districts reduce their carbon							
	footprint and comply wit			s, neiping districts r	reduce their carbon			
"Market" - Target	What is the primary targ		143.					
market		ction/distribution/co	onsumption					
	Please specify the most		or(s) of the KER, v	vithin the selected	market:			
	, ,	mal energy generat	, ,		J ,			
		ct heating & cooling						
		gy efficiency measu	ires and demand-	side management.				
	The market targeted by  ■ ✓ The market is		ed it is not vot slo	or that the inneventi	on has potential to			
	create a new ma		id it is flot yet clea	ar triat trie irii lovati	on has potential to			
	Market dynamics: is the market?							
	Are there other markets for this innovation that the innovators are not yet targeting?							
	● 図 No							
	Market competition: Ho		tition in the targe	et market?				
"Market" -	Patchy, no ma  Please make a list of t		orking in the s	me field (e.g. the	manufacturors /			
Competitors	providers of the alternat				: manufacturers /			
Compositions	€ Others:	p		· · · · · · · · · · · · · · · · · · ·				
	1. CEA community (Zurich, CH) developing the open-source City Energy Analyst							
	software.							
Go to Market – Business model	What are the relevant E							
business model	examples of business m	oueis, piease reiei	to the last pages	or this document	•			
			Scarcely		Very well			
	Business Model	Not applicable	applicable	Applicable	applicable			
	- ·		прроп.	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	арриошио			
	Freemium model			Х				
	Pay as go model		X					
	Other			Open-source				
Go to Market -	Please make an initial h	igh-level description	on of the actions	to be performed a	fter the end of the			
Timing	project, to make the solu			ITION! The detailed	l list of actions will			
	be managed in the Expl							
		month after the pro	oject:					
	<ul> <li>1. List potential customers.</li> <li>€ Within 6 months after the project:</li> </ul>							
	<u>Within 6 months</u> after the project:     Demonstration to potential customers.							
	2. Collect their feedback for improvement.							
	€ <u>Within 12 months</u> after the project:							
	Learn and adapt the service to customer requirements							
	Test the service again with potential customers  Within 24 months after the project:  **Test the service again with potential customers**  **Test the service again with potential custome							
	<ul> <li>€ Within 24 months after the project:</li> <li>1. Sell the adapted service to first customers</li> </ul>							
	1. Sell the	adapted service to	first customers					





Go to Market – IPR Background	Please check <b>if there is any type of Intellectual property already secured</b> (before the proj started) and that helped the development of the solution. For definition and examples of instruments, please refer to the last pages of this document.					
	Туре	Owner				
	Patent					
	Trade secret					
	Copyright					
	Trademark					
Go to Market – IPR	Please check if the developed solution (within the end of the project) could be protected with					
Foreground	one (or more) type of Intellectual property:					
	Туре	Owners				
	Patent					
	Trade secret					
	Copyright	R2M, CERTH				
	Trademark					





### 6 CONCLUSIONS

Deliverable 7.6, which is the result of numerous interactions and exchange of information with all the partners, highlights the preliminary findings related to exploitation in EVELIXIA. Workshops, one-to-one meetings and email exchanges fostered formative discussions on the project's results and were crucial to drafting the present report.

The reported results set the basis for the development of complete and comprehensive exploitation plans which will indicate the path to market for EVELIXIA technologies. The updated version of this document (D7.7) will report at M48 the mentioned exploitation plans, the partners' intentions and expectation in the exploitation of project results, the evaluation of risks associated with each KER and the IPR management strategy for all the project's partners.