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January 2023

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# Smart Buildings EU-funded Innovations

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The SmartBuilt4EU project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 956936.



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# Foreword

## by the European Commission

**E**uropean buildings generate 36% of the EU's greenhouse gas emissions, making them a key element of the Europe's strategy to achieve climate neutrality by 2050. As nearly 75% of the European buildings are energy inefficient, the European Green Deal is targeting the building sector's tremendous potential for energy savings through the Renovation Wave strategy.

Smarter buildings can not only complement renovation focusing on the building envelope or energy consuming equipment to make buildings energy performance even higher, but also reach buildings where renovation cannot be contemplated. Europe is currently preparing to introduce a Smart Readiness Indicator to inform and build trust in the benefits of smart buildings, including increased comfort, positive environmental impacts or financial gains.

The European Commission has been supporting innovation and market uptake of smart buildings technologies and services by trying to improve awareness and acceptance of building occupants, interoperability between devices and systems, energy optimisation within and between buildings, energy services offered to consumers, or the integration of building flexibility with energy networks.

In November 2020, the project SmartBuilt4EU started, with the objective of supporting and consolidating the Smart Building Innovation Community. In order to unlock the full potential of smart buildings in terms of innovation, energy transition and jobs, SmartBuilt4EU aims to break silos and increase exchanges between innovation, markets and policy.

This brochure contributes to identify innovation leaders demonstrating new technologies and approaches, bringing down barriers or sharing good practices among recent EU-funded projects.

### **European Commission**

European Climate, Infrastructure and Environment Executive Agency  
(CINEA)

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# Foreword

## by the SmartBuilt4EU Partners

**T**he SmartBuilt4EU project Partners are pleased to introduce the third edition of the “Smart Buildings EU-funded Innovations” brochure, which reading we hope you will enjoy.

SmartBuilt4EU is an EU-funded project that aims, in particular, at supporting the innovation ecosystem in the domain of smart buildings through concrete networking and communication actions. One of these actions, which is directly linked to the present publication, consists in highlighting and promoting past or ongoing initiatives, projects and technologies, which make the Smart Building sector and related topics evolve and progress.

In addition, SmartBuilt4EU is strongly related to the last developments of the Smart Readiness Indicator (SRI) – a common EU scheme introduced by the 2018 European Energy Performance of Buildings Directive (EPBD) for rating the smart readiness of buildings - and to the seven “Impact criteria” that it has defined and that will be detailed in the following pages. SmartBuilt4EU has indeed coordinated the Smart Buildings Innovation Community’s contributions to the SRI promotion, experimentation and implementation.

Within this framework, this brochure provides a portfolio of synthetic factsheets concerning 101 EU-funded projects, which have been identified and selected for their particular relevance with the Smart Building topic. They are organised by alphabetical order and include an executive summary, a description of the consortium, general information about the duration and budget as well as a link to the projects’ websites. In addition, each factsheet indicates which of the seven SRI impact criteria are concerned by the project.

This is the third and last release of the brochure, that was originally published in 2021 and subsequently updated in 2022 and now in 2023 so as to include a wider set of newly identified projects.

The SmartBuilt4EU Partners

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# Contents

08

## **Background**

### **Projects**

16	4RinEU
17	ACCEPT
18	ACCORD
19	ARISE
20	ASHVIN
21	Auto-DAN
22	BaaS
23	BENEFFICE
24	BEYOND
25	BIGG
26	BIM2TWIN
27	BIM4EEB
28	BIM4REN
29	BIM-SPEED
30	BIMprove
31	Build-in-Wood
32	BuiltHub
33	BUSGoCircular
34	CHARGED
35	Chess Setup
36	CHRONICLE
37	COGITO
38	COLLECTiEF
39	Cultural-E

40	D^2EPC
41	DBL Study
42	domOS
43	DR-BOB
44	DRIMPAC
45	DRIVE
46	DRIVE 0
47	E-DYCE
48	E2VENT
49	EasySRI
50	ebalance-plus
51	EBENTO
52	ECO-Qube
53	ENERGE
54	ENSNARE
55	ePANACEA
56	EPC4SES
57	EPC RECAST
58	eTEACHER
59	EXCESS
60	FinSESCO
61	FORTESIE
62	frESCO
63	GEOFIT
64	HEART
65	Heat4Cool
66	HIT2GAP

67	HOLISDER
68	Homes4Life
69	HYBUILD
70	iBECOME
71	INCUBE
72	InterConnect
73	LIFE-SBE4LCHCB
74	LowUP
75	MATRYCS
76	MERLON
77	MiniStor
78	MODERATE
79	MORE-CONNECT
80	OptEEmALE
81	P2Endure
82	PARITY
83	PHOENIX
84	PLURAL
85	PRECEPT
86	PRELUDE
87	PVSITES
88	QualDeEPC
89	QUEST
90	ReDREAM
91	Reincarnate
92	REMOURBAN
93	REnnovates

94	RenoZEB
95	REPLICATE
96	RESPOND
97	REWARDHeat
98	RUGGEDISED
99	SATO
100	Sim4Blocks
101	Smart2B
102	SmartEnCity
103	SmartLivingEPC
104	SMART SQUARE
105	SMI
106	SPHERE
107	SRI-ENACT
108	SRI2MARKET
109	STARDUST
110	StepUP
111	SunHorizon
112	SUPERHERO
113	syn.ikia
114	TABEDE
115	TIMEPAC
116	TRI-HP
117	U-CERT

**118 About SmartBuilt4EU**

**119 Project Partners**

## " Smartness of a building

REFERS TO

the **ability** of a building or its systems to **sense, interpret, communicate** and **actively** respond in an **efficient manner** to **changing conditions**.

THIS IS IN RELATION TO

the **operation** of **technical building systems** or the **external environment** (including energy grids) and to **demands** from **building occupants**. " <sup>1</sup>



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# Background

## A Smart Readiness Indicator for buildings

Smart technologies in buildings can be a cost-effective means to assist in creating healthier and more comfortable buildings with a lower energy use and carbon impact. Smart technologies can also facilitate the integration of renewable energy sources in future energy systems.



In the 2018 revision of the European Energy Performance of Buildings Directive (EPBD), the potential of smart technologies in the building sector was heavily emphasised. As part of this focus, the EPBD introduced the concept of a “Smart Readiness Indicator” (SRI): **a common EU scheme for rating the smart readiness of buildings.**

The SRI examines the technological readiness of buildings across three main pillars:

- to interact with their occupants,
- to interact with connected energy grids
- and to operate more (energy-)efficiently.

The aim of the SRI is to raise awareness of the benefits of smarter building technologies and make their added value more tangible for building users, owners, tenants, and smart service providers. It seeks to support technology innovation in the construction sector and create an incentive for the integration of cutting-edge smart technologies in buildings.

The methodology for calculating the SRI is based on the assessment of smart-ready services available or planned at design stage in a building or building unit, and of additional smart-ready services that are considered relevant.

In this brochure, each 'smart building'-related innovation project is categorized by these impact criteria depending on their focus.

# Seven impact criteria

A smart-ready service can provide several positive impacts to the building, its users, and the energy grid. The SRI scheme proposes seven impact criteria as follows:



## ENERGY EFFICIENCY

This category refers to the impacts of the smart-ready services on energy saving capabilities. The SRI rating does not consider the whole energy performance of buildings, but only the contribution of the smart-ready technologies, for instance resulting from better control of room temperature settings.



## MAINTENANCE AND FAULT PREDICTION

This impact category refers to automated fault detection and diagnosis. This has the potential to significantly improve maintenance and operation of technical building systems. It also has potential impacts on the energy performance of the technical building systems by detecting and diagnosing inefficient operations.



## COMFORT

This category refers to the impacts of services on occupants' comfort. Comfort refers to conscious and unconscious perception of the physical environment, including thermal, acoustic, and visual comfort. For instance, provision of sufficient lighting levels without glare.



## CONVENIENCE

This category refers to the impacts of services on convenience for occupants. In other words, the extent to which services "make life easier" for the occupant. For instance through technical building systems requiring fewer manual interactions.



### HEALTH, WELL-BEING AND ACCESSIBILITY

This category refers to the impacts of services on the well-being and health of occupants. For instance, smarter controls can deliver an improved indoor air quality compared to traditional controls, thus raising occupants' well-being, with a commensurate impact on their health.



### INFORMATION TO OCCUPANTS

This impact category refers to the ability of the building and its systems to provide information on building operation to occupants or to facility managers. For instance, real time information on renewable energy conversion, or actual indoor air quality.



### ENERGY FLEXIBILITY AND STORAGE

This category refers to the impacts of services on the energy flexibility potential of the building: i.e. the capacity to shift energy demands in time to create a better match between energy demand and energy supply (especially in case of intermittent renewable energy sources). The scheme does not solely focus on electricity grids, but also includes flexibility offered to district heating and cooling grids.

## References for further reading

- <sup>1</sup> Final report on the technical support to the development of a smart readiness indicator for buildings ; Published: 2020-09-18; ISBN 978-92-76-19197-1; DOI 10.2833/41100; Catalogue number MJ-03-20-335-EN-N
- Commission Delegated Regulation (EU) 2020/2155 of 14 October 2020 supplementing Directive (EU) 2010/31/EU of the European Parliament and of the Council by establishing an optional common European Union scheme for rating the smart readiness of buildings (Text with EEA relevance) – C/2020/6930
- Commission Implementing Regulation (EU) 2020/2156 of 14 October 2020 detailing the technical modalities for the effective implementation of an optional common Union scheme for rating the smart readiness of buildings (Text with EEA relevance) – C/2020/6929

# Projects & their SRI at a glance

## Legend

- Energy efficiency 
- Maintenance & fault prediction 
- Comfort 
- Convenience 
- Health, well-being & accessibility 
- Information to occupants 
- Energy flexibility & storage 



Project	Energy efficiency	Maintenance & fault prediction	Comfort	Convenience	Health, well-being & accessibility	Information to occupants	Energy flexibility & storage
4RinEU	●	○	●	●	●	●	○
ACCEPT	●	○	●	●	●	●	●
ACCORD	●	○	○	○	○	●	○
ARISE	●	●	●	●	●	●	○
ASHVIN	●	●	○	○	○	○	○
Auto-DAN	●	●	○	○	○	○	●
BaaS	●	●	●	●	●	●	○
BENEFFICE	●	○	○	○	○	●	○
BEYOND	●	●	●	●	○	●	○
BIGG	●	●	●	●	●	●	○
BIM2TWIN	●	●	○	○	●	○	○
BIM4EEB	●	●	●	○	○	●	○
BIM4REN	●	●	○	○	○	○	○
BIM-SPEED	●	○	●	●	○	●	○
BIMprove	●	●	●	●	●	●	○
Build-in-Wood	●	○	●	●	●	○	○
BuiltHub	●	○	○	○	○	○	○
BUSGoCircular	●	●	●	●	●	●	○
CHARGED	●	○	○	●	○	○	○
Chess Setup	●	○	○	○	○	○	●
CHRONICLE	●	●	●	●	●	●	●
COGITO	●	●	○	○	○	○	○
COLLECTiEF	●	○	●	●	●	●	●
Cultural-E	●	○	●	●	●	●	●
D*2EPC	●	●	●	●	●	●	○
DBL Study	●	●	○	○	○	○	○
domOS	●	●	○	○	○	○	○
DR-BOB	●	●	○	○	○	○	●
DRIMPAC	●	○	○	○	○	○	○
DRIVE	●	○	○	○	○	○	○
DRIVE 0	●	○	○	●	○	○	○
E-DYCE	●	○	●	○	●	○	○
E2VENT	●	○	○	○	○	○	○
EasySRI	●	●	●	●	●	●	○
ebalance-plus	●	○	○	○	○	○	●
EBENTO	●	●	●	○	○	○	○
ECO-Qube	●	●	○	○	○	○	○
ENERGE	●	○	○	○	●	○	○
ENSNARE	●	●	○	○	○	○	○
ePANACEA	●	○	○	○	○	○	○
EPC4SES	●	○	○	○	○	○	○
EPC RECAST	●	●	●	●	●	●	○
eTEACHER	●	○	○	○	○	○	○
EXCESS	●	●	○	○	○	○	○
FinSESCO	●	●	○	○	○	○	○
FORTESIE	●	○	○	○	○	○	○
frESCO	●	○	○	○	○	○	○
GEOFIT	●	○	○	○	○	○	○
HEART	●	○	○	○	○	○	○
Heat4Cool	●	●	●	○	○	○	○
HIT2GAP	●	●	●	○	○	○	○



HOLISDER	●	●	○	○	○	●	●
Homes4Life	●	○	●	●	●	●	○
HYBUILD	●	○	●	○	○	○	●
iBECOME	●	●	●	●	●	●	●
INCUBE	●	●	●	●	●	●	●
InterConnect	●	○	○	○	○	●	●
LIFE-SBE4LCHCB	●	○	●	○	●	●	○
LowUP	●	○	○	○	○	○	○
MATRYCS	●	○	○	○	○	○	●
MERLON	●	○	●	○	○	○	●
MiniStor	●	○	●	○	●	●	●
MODERATE	●	●	●	○	●	●	○
MORE-CONNECT	●	○	○	○	○	○	○
OptEEmALE	●	○	●	●	●	●	○
P2Endure	●	●	○	○	○	●	○
PARITY	●	○	●	●	○	●	○
PHOENIX	●	●	●	○	○	○	○
PLURAL	●	○	●	○	○	○	●
PRECEPT	●	●	●	○	●	●	○
PRELUDE	●	●	○	○	○	○	○
PVSITES	●	○	○	○	○	○	●
QualDeEPC	●	○	●	○	○	●	○
QUEST	●	●	○	○	●	●	○
ReDREAM	●	○	●	○	○	●	○
Reincarnate	○	●	○	○	○	○	●
REMOURBAN	●	○	●	○	●	●	○
REnnovates	●	○	○	○	○	○	○
RenoZEB	●	●	●	●	●	○	○
REPLICATE	●	○	○	○	○	○	○
RESPOND	●	○	○	○	○	○	○
REWARDHeat	●	●	●	●	●	○	●
RUGGEDISED	●	○	○	●	○	○	○
SATO	●	○	○	○	○	○	○
Sim4Blocks	●	○	○	○	○	○	○
Smart2B	●	●	●	●	●	●	○
SmartEnCity	●	○	●	○	○	○	○
SmartLivingEPC	●	○	●	●	●	●	○
SMART SQUARE	●	●	●	●	●	●	○
SMI	●	○	○	○	○	○	○
SPHERE	●	○	○	○	○	○	○
SRI-ENACT	●	●	●	●	●	●	○
SRI2MARKET	●	●	●	●	●	●	○
STARDUST	●	○	●	●	●	●	○
StepUP	●	●	●	●	●	●	○
SunHorizon	●	●	●	●	○	●	○
SUPERHERO	●	○	○	○	○	○	○
syn.ilkia	○	○	○	○	○	○	○
TABEDE	●	○	○	○	○	○	○
TIMEPAC	●	○	●	○	○	○	○
TRI-HP	●	●	●	●	○	●	○
U-CERT	●	●	●	●	●	●	○

In total



101 PROJECTS



51 PROJECTS



73 PROJECTS



45 PROJECTS



49 PROJECTS



75 PROJECTS



64 PROJECTS

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# Main trends & alignment with key policies

Most projects presented in this brochure are aligned with key measures from the **Energy Efficiency Directive (EED)** and/or the **Energy Performance of Buildings Directive (EPBD)**, with the **EU Green Deal**, and for some of them also with the **New European Bauhaus (NEB)** initiative.

Several projects are focussing on innovative technologies (e.g. plug and play solutions, one-stop-shops, etc.) which will facilitate **Deep Renovation** of the EU building stock (**4RinEU, BuiltHUB, BIMREN, BIM-SPEED, ENSNARE, INCUBE, P2Endure, PLURAL, StepUP**). Some of them give a specific attention to **Circularity** (**DRIVE 0, Reincarnate**) with technologies which aim for instance to reduce the amount of construction & demolition waste. This includes also supporting the development of **Sustainable Energy Skills** (**ARISE, BUSGoCircular**) so that the EU workforce becomes more familiar with the possibilities offered by smart building technologies.

**Renewable Energy Sources (RES) integration in buildings** (**GEOFIT, HYBUILD, MiniStor, TRI-HP**), the development of **active building components** (**E2VENT, ECO-Qube, LIFE-SBE4LCHCB, PVSITES, SunHorizon, SUPERHERO**), as well as a smarter integration with **District Heating and Cooling (DHC) networks** (**REWARDHeat**) will allow transitioning from nearly-zero to **Positive Energy Buildings** (**Build-in-Wood, Chess Setup, Cultural-E, EXCESS, RenoZEB**). These are often combined with **Consumer Engagement** smart technologies (**BENEFFICE, CHARGED, ENERGE, eTEACHER, ReDREAM**) to ensure building occupants will be actively involved in the optimisation process. Some projects also look at health and accessibility of smart buildings through the angle of **Age-Friendly Housing** (**Homes4Life**).

Beyond the building-scale optimisation, selected projects

also look at making the bridge with district and urban scales, for instance through the development of **urban regeneration models** which will deliberately implement smart building technologies (OptEEmAL, REMOURBAN, RENnovates, REPLICATE, RUGGEDISED, SmartEnCity, STARDUST, syn.ikia).

**Building Information Modelling - BIM** (ACCORD, BIM2TWIN, BIM4EEB, BIM4REN, BIM-SPEED, BIMprove, PLURAL), **Big Data** techniques (BEYOND) and **Artificial Intelligence** technologies (Auto-DAN, BIGG, ECO-Qube, iBECOME, MATRYCS, PHOENIX, PRELUDE, SATO, SMI) are foreseen as key enablers to optimize energy efficiency as well as comfort and convenience of buildings. They are often linked with the concept of developing full **Digital Twins** of buildings (ASHVIN, BIM2TWIN, COGITO, EPC4SES, SPHERE).

**Interoperability**, for instance with W3C standards, and the adoption of **common standards and nomenclatures** such as SAREF (BaaS, COLLECTiEF, domOS, DRIMPAC, DRIVE, InterConnect, MODERATE, Smart2B) will support the adoption and integration of the developed smart technologies. The **Digital Building Logbook** (CHRONICLE, EU DBL Technical Study) will be a key technological component in this regard.

**New business models** are investigated in relation to **Demand-Response** and **Flexibility** (DR-BOB, DRIMPAC, ebalance-plus, frESCO, HOLISDER, MERLON, PARITY, PRECEPT, RESPOND, SIM4BLOCKS, TABEDE). These will support the development of **Energy Communities** (ACCEPT) as well as the emergence of new **Energy Performance Contracting and Guarantee** mechanisms (EBENTO, FinSESCO, FORTESIE).

Eventually, numerous projects work on the development of the **next-generation of Energy Performance Certificates** (D^2EPC, E-DYCE, ePANACEA, EPC4SES, EPC-RECAST, QualDeEPC, SmartLivingEPC, TIMEPAC, U-CERT), and their possible integration with the **Smart Readiness Indicator** (EasySRI, SMART SQUARE, SRI-ENACT, SRI2MARKET), to ensure that the positive impacts of smart building technologies become more visible and better understood.

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2016**

Duration **57 months**

Status **Completed**

Total budget **4,6 M€**

## 4RinEU

Robust and Reliable technology concepts and business models for triggering deep Renovation of Residential buildings in EU

4RinEU developed new products, tools, and strategies to encourage large-scale deep renovation of existing buildings, fostering the use of renewable energies, and providing reliable business models. Its solutions minimize failures in design and implementation, manage different stages of the deep renovation process, and provide information on energy, comfort, users' impact, and investment performance.

[4rineu.eu](http://4rineu.eu)

EURAC, Italy

**Germany:** Gumpp & Maier Gmbh

**Italy:** Aderma Srl, Thermics Energie Srl, R2M Solution Srl

**Netherlands:** Trecodome Bv, Stichting Woonzorg Nederland

**Norway:** Oslo Kommune, Sintef As

**Spain:** Sistemes Avancats De Energia Solar Termica Sccl – Aiguasol, Acciona Construccion Sa, Agencia De L'habitatge De Catalunya

**United Kingdom:** IES - Integrated Environmental Solutions Limited





Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Jan. 2021**

Duration **42 months**

Status **In Progress**

Total budget **7,6 M€**

# ACCEPT

## Active Communities & Energy Prosumers for the Energy Transition

The ACCEPT project intends to develop and deliver a digital toolbox that allows energy communities to exploit the flexibility of energy resources within their portfolio to offer innovative digital services and access revenue streams that can financially support their functions and secure their sustainability and effectiveness. The ACCEPT framework will be demonstrated in four pilot sites in Greece, the Netherlands, Spain, and Switzerland.

[accept-project.eu](http://accept-project.eu)

Hypertech, Greece

Austria: EEE

Cyprus: Witside

Denmark: GECO

Greece: Hypertech, QUE, CERTH, Mytilineos

Ireland: UCC

Italy: RINA-C

Netherlands: ESB, EDBR

Spain: CIRCE, MIWenergia, LaSolar, Viesgo

Switzerland: AEM



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Sep. 2022**

Duration **36 months**

Status **In Progress**

Total budget **4,3 M€**

# ACCORD

## Automated Compliance Checks for Construction, Renovation or Demolition Works

ACCORD's objective is to digitalise permitting and compliance processes using BIM and other data sources to improve the productivity and quality of design and construction processes, support the design of climate-neutral buildings and advance a sustainable built environment in line with the EU Green Deal and new European Bauhaus initiative.

[accordproject.eu](https://accordproject.eu)

VTT, Finland

**Belgium:** Open Geospatial Consortium Europe, Conseil Des Architectes D'europe

**Bulgary:** Sirma Ai Ead

**Estonia:** Majandus Ja Kommunikatsiooniministeerium

**Finland:** Teknologian Tutkimuskeskus Vtt Oy, Solibri Oy, Cloudpermit Oy

**France:** Institut Mines-Telecom

**Germany:** Fraunhofer Gesellschaft Zur Forderung Der Angewandten Forschung Ev, Universitaet Koblenz-Landau, Freie Und Hansestadt Hamburg, Tegel Projekt Gmbh

**Italy:** Aether Engineering S.A.S. Tra Professionisti Di Christovasilis Ioannis

**Netherlands:** Future Insight Group Bv

**Spain:** Ayuntamiento De Malgrat De Mar, Institut De Tecnologia De La Construccio De Catalunya, Fundacio Privada Universitat I Tecnologia

**Sweden:** Tekniska Hogskolan I Jonkoping

**UK:** Cardiff University, Birmingham City University, Buildingsmart International Limited



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Sep. 2021**

Duration **30 months**

Status **In Progress**

Total budget **1,1 M€**

## ARISE

Inspiring demand for sustainable energy skills, by providing clear learning interactions, transparency of upskilling transactions and recognition of qualifications achieved

ARISE goal is to revolutionize the learning process by changing both delivery and recognition of sustainable energy skills in the construction sector. The new system of training and recognition of skills will be valid across the EU, increasing the spread of skilled workforce in the building market. It will transform the learning process by monetizing skills development with a digital system based on skills recognition.

[www.ariseproject.eu](http://www.ariseproject.eu)

Belfast Met, Northern Ireland

**Belgium:** Conseil Des Architectes D'europe

**Denmark:** Kobenhavns Erhvervsakademi

**Italy:** Istituto Per Il Building Information Modelling Italia

**Ireland:** Technological University Dublin,

**Netherlands:** Stichting Isso, Building Changes Support Bv

**North Macedonia:** Private Scientific Institution, Institute For Research In Environment, Civil Engineering And Energy, Skopje

**Northern Ireland:** Belfast Metropolitan College

**Portugal:** Instituto Superior Tecnico



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2020**

Duration **36 months**

Status **In Progress**

Total budget **5,6 M€**

# ASHVIN

Assistant for Healthy, Safe and Productive Virtual Construction, Design, Operation & Maintenance using Digital Twin

The ASHVIN project develops a solution combining an open-source digital twin platform connected to IoT and image technologies and integrated applications with the objective to reinforce productivity, while reducing costs, and safety of European construction sites and maintenance operations.

The implementation of the system is demonstrated on ten real case studies including bridges, buildings, and industrial projects around Europe.

[www.ashvin.eu](http://www.ashvin.eu)

TUB, Germany

Austria: ASI

Croatia: INFCON

Germany: TUB, DTT, SBP

Greece: CERTH

Netherlands: EUR, INGEO

Poland: FAS

Serbia: MFL

Spain: AUS, UPC

Sweden: NCC, Plan B



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2020**

Duration **48 months**

Status **In Progress**

Total budget **5,6 M€**

## Auto-DAN

Deploying Augmented intelligence solutions in EU buildings using Data analytics, an interoperable hardware/software Architecture and a Novel self-energy assessment methodology

Auto-DAN aims to enable small-to-medium-sized buildings to optimize their energy consumption and to provide a self-assessment and self-optimizing system by implementing a flexible hardware infrastructure and augmented intelligence. Auto-DAN accelerates investments in sustainable energy by providing a live self-energy assessment incorporating monitoring and smart controls based on the quality of systems installed and users' operational habits.

[autodan-project.eu](http://autodan-project.eu)

IES R&D - Ireland

**Ireland:** MSEMICON Teoranta, O Cualann cohousing alliance company limited by guarantee, Technological University of Dublin

**Italy:** Civiesco SRL, Delta Ecopolis – Società Cooperativa, Flairbit SRL, RINA Consulting, Schneider Electric SPA

**Spain:** Fundacion Cartif, Universidad de Burgos

**Turkey:** Arcelik A.S.



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Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



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**Website**

**Coordinator**

**Partners**

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Start date **May 2012**

Duration **48 months**

Status **Completed**

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Total budget **3,35 M€**

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# BaaS

## Buildings as a Service (Ecosystem)

The BaaS system aims to optimize energy performance in the application domain of non-residential buildings, in operational stage. A generic ICT-enabled system was developed to provide integrated services that guarantee harmonious and parsimonious use of available resources. Upon verification of component interoperability, and development of a M&V plan, the BaaS system was demonstrated in real buildings and validated as an ECM with ESCOs.

[www.baas-project.eu](http://www.baas-project.eu)

Fundación CARTIF, Spain

**Czech Republic:** Honeywell

**Germany:** Fraunhofer IBP

**Greece:** TUC

**Ireland:** University College Cork

**Spain:** CARTIF, VEOLIA

**UK:** NEC



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Nov. 2017**

Duration **42 months**

Status **Completed**

Total budget **2 M€**

## BENEFFICE

Energy Behaviour Change driven by plug-and-play-and-forget ICT and Business Models focusing on complementary currency for Energy Efficiency for Households

BENEFFICE aims to reduce wasted energy by changing the daily behaviour of people in their homes. Here's how it works: Users homes are monitored and save energy. BENEFFICE measures it and users get rewarded in €O2s, which can be spent using a neo-banking application. BENEFFICE launched €O2, an alternative currency, which aims to support reduction of energy waste in houses, through a system of rewards for its users.

[benefice.eu](http://benefice.eu)

European Dynamics Belgium SA.

**Austria:** VerbundSolutions4Customers

**Denmark:** GECO Global

**France:** Compte CO2

**Greece:** National Technical University of Athens, Kafkas

**Spain:** Eurofunding



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Dec. 2020**

Duration **36 months**

Status **In Progress**

Total budget **5,2 M€**

## BEYOND

A reference big data platform implementation and AI analytics toolkit toward innovative data sharing-driven energy service ecosystems for the building sector and beyond

BEYOND develops & offers a Big Data platform & a set of technologies that allow energy value chain actors to search, find & utilize data generated by buildings. By using the platform, these actors can run analytics & simulations that are needed to design a project & exploit them during the real-time run time of the buildings so as to optimize their operation & energy performance.

**beyond-h2020.eu**

UBITECH, Greece

**Greece:** Ubitech, IGM, Mytilinaios

**Finland:** VTT, Forum Virium

**Spain:** Circe, Cuerva, Urbener

**Cyprus:** Suite5

**Croatia:** KONCAR

**France:** Artelys

**Serbia:** Belit, Beogradske elektrane





Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Dec. 2020**

Duration **36 months**

Status **In progress**

Total budget **4,9 M€**

# BIGG

## Building Information aGGregation, harmonization and analytics platform

BIGG aims at demonstrating the application of big data technologies and data analytic techniques for the complete buildings life-cycle of more than 4000 buildings in 6 large-scale pilot test-beds. The case studies include: Benchmarking and energy efficiency tracking, Energy certification, Building life-cycle, Energy Performance Contract-based savings, Buildings for occupants (Comfort case) and Electricity and Gas demand-response.

[www.bigg-project.eu](http://www.bigg-project.eu)

Inetum, Spain

**Belgium:** Inetum Realdolmen, imec, ECTP

**France:** CSTB, Helexia

**Greece:** domX, HERON, Cordia

**Italy:** Intuicy

**Spain:** CIMNE, ICAEN, ICAT



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Nov. 2020**

Duration **42 months**

Status **In Progress**

Total budget **6 M€**

# BIM2TWIN

Digital twin platform for efficient construction management

BIM2TWIN aims to build a Digital Building Twin (DBT) platform for construction management that implements lean principles to reduce operational waste of all kinds. The platform provides full situational awareness and an extensible set of applications like monitoring of schedule, quantities & budget, quality, safety, and environmental impact.

**bim2twin.eu**

CSTB, France

**Denmark:** Danmarks Tekniske Universitet

**Finland:** FIRA Group Oy

**France:** CSTB, INRIA, SPADA Construction, Orange SA

**Germany:** Technische Universitaet Muenchen, Ruhr-Universitaet Bochum, Siemens Aktiengesellschaft

**Israel:** Technion - Israel Institute of Technology, INTSITE Ltd

**Italy:** Universita Politecnica delle Marche, Unismart

**Spain:** Tecnalia, Acciona, IDP Ingenieria y Arquitectura Iberia SL

**United Kingdom:** University of Cambridge



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Jan. 2019**

Duration **42 months**

Status **Completed**

Total budget **6,9 M€**

## BIM4EEB

# BIM based fast toolkit for Efficient rEnovation of residential Buildings

BIM4EEB aims to foster the renovation industry by developing an attractive and powerful BIM management system with BIM-based toolset to support designers, construction and service involved in building retrofitting. The BIM management system and tools will also facilitate the decision making due to the exploitation of augmented reality and the use of updated digital logbooks.

[www.bim4eeb-project.eu](http://www.bim4eeb-project.eu)

Bruno Daniotti from the Politecnico di Milano, Italy

**Belgium:** Architects' Council of Europe (ACE)

**Cyprus:** Suite5 Data Intelligence Solutions Limited

**Germany:** Technische Universität Dresden

**Finland:** Caverion Suomi Oy, Visualynk Oy, Teknologian tutkimuskeskus VTT Oy

**Ireland:** University College Cork, National University of Ireland

**Italy:** One Team Srl, Regione Lombardia, Azienda Lombardia per l'Edilizia Va-Co-MB, Busto Arsizio

**Poland:** Prochem

**Spain:** Solintel M&P

**Sweden:** Research Institutes of Sweden (RISE), CGI Sverige AB



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2018**

Duration **48 months**

Status **Completed**

Total budget **6,9 M€**

## BIM4REN

Building Information Modelling based tools & technologies for fast and efficient Renovation of residential buildings

BIM4REN adapts 3 workflows of the construction sector segmentation to provide BIM developments for each, focusing on renovation of the EU building stock. B4R digital ecosystem will be accessible via a web-based One Stop Access Platform, where depending on user profile needs, best practices from a dedicated database and links to the different tools and services will be provided on differentiated access schemes underpinned by new business models.

[bim4ren.eu](http://bim4ren.eu)

NOBATEK INEF-4, France

**Belgium:** European Builders Confederation

**France:** NOBATEK INEF-4, CSTB, EDF, WISEBIM, Logirep, EnerBIM

**Germany:** AEC3, RWTH, FRAUNHOFER ISE

**Ireland:** IES

**Italy:** R2M Solution, GBC Italy, CMB Capri, ATI Project

**Lithuania:** Vilnius Gedimas

**Netherlands:** TNO

**Romania:** TERMOLINE

**Spain:** TECNALIA, COMET, Kursaal

**UK:** EcoWise



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Nov. 2018**

Duration **48 months**

Status **Completed**

Total budget **7 M€**

# BIM-SPEED

## Harmonised Building Information Speedway for Energy-Efficient Renovation

BIM-SPEED project aims to accelerate the energy-efficient renovation of residential buildings across the EU through the implementation of state-of-the-art BIM solutions with a real impact on the energy performance of buildings. Through innovative BIM tools and methodologies, BIM-SPEED aims to facilitate deep renovation processes, in a shorter time, with reduced costs, better quality and higher performance.

[bim-speed.eu](http://bim-speed.eu)

Technische Universität Berlin, Germany

**Belgium:** REHVA, EBC, FIEC, ACE-CAE

**Bulgaria:** Architectural Spies

**France:** CSTB

**Germany:** TUB, Hochtief, PB40, Metabuild

**Italy:** UNIVPM, STRESS

**Netherlands:** DEMO, UN Studio, Erasmus University

**Poland:** Mostostal, Fasada,

**Romania:** Arcadis

**Spain:** CARTIF, CYPE, KREAN, Visesa



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Sep. 2020**

Duration **36 months**

Status **In progress**

Total budget **5,6 M€**

# BIMprove

## Improving Building Information Modelling by Realtime Tracing of Construction Processes

BIMprove revolutionizes the stagnant European construction industry and solves long-standing problems such as decreasing productivity, dangerous environment for workers, negative environmental impact and budget misalignment with real expenditures. By providing a complete digital workflow, BIMprove helps to sustainably improve the productivity and image of the European construction industry.

[www.bimprove-h2020.eu](http://www.bimprove-h2020.eu)

SINTEF Manufacturing, Norway

Finland: VTT

Germany: DIN, FRAUNHOFER IAO, STUTTGART UNIVERSITY

Norway: SINTEF, CATENDA, AF GROUP

Spain: AUSTRALO, VIAS, ROBOTNIK

Switzerland: HRS, ZHAW



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Sep. 2019**

Duration **48 months**

Status **In Progress**

Total budget **10,3 M€**

## Build-in-Wood

Sustainable wood value chains for construction of low-carbon multi-storey buildings from renewable resources

The project will develop a sustainable and innovative wood value chain for the construction of multi-storey wood buildings. It will develop the materials and components as well as structural systems and façade elements for both new construction and retrofitting applications. The project will deliver a Design Guide on materials and components and will demonstrate digital case projects and a test system for prototypes.

[www.build-in-wood.eu](http://www.build-in-wood.eu)

TEKNOLOGISK INSTITUT, Denmark

**Austria:** Proholz Tirol, Rtd Services

**Canada:** Ellisdon Corporation

**Denmark:** Scandi Byg, Adserballe & Knudsen, Alexandra Instituttet

**Germany:** Knauf Gips, Hsbcad Gmbh

**Greece:** National Technical University of Athens

**Italy:** Distretto Tecnologico Trentino Scarl, Rotho Blaas Srl, Piva Franco, Universita Degli Studi Di Siena

**Norway:** Norsk Treteknisk Institutt Forening

**Romania:** Urbasofia Srl, Agentia Metropolitana Pentru Dezvoltare Durabila Brasov Asociatia

**Spain:** Bimetrica Parametric Design Services

**Sweden:** C.F. Moller Sverige Ab

**United Kingdom:** Waugh Thistleton Architects Limited

**Finland:** STORA ENSO OYJ



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2020**

Duration **48 months**

Status **In Progress**

Total budget **2,2 M€**

# BuiltHub

## Dynamic EU building stock knowledge hub

BuiltHub will define a roadmap for durable data flow to characterise the EU building stock by developing an organised and inclusive data collection method, a structured web-based datahub, and long-lasting data flow through a benefits-based engagement strategy addressing data and metadata providers and users. The strategy will be applied through value information services tailored to users.

[www.builthub.eu](http://www.builthub.eu)

Eurac Research, Italy

Austria: TU Wien

Belgium: BPIE

Germany: ICLEI-EU

Greece: Sympraxis

Spain: CARTIF, NTT Data

Sweden: Research Institutes of Sweden (RISE)





Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Sep. 2020**

Duration **36 months**

Status **In progress**

Total budget **5,6 M€**

## BUSGoCircular

BUS-GoCircular - stimulate demand for sustainable energy skills with circularity as a driver and multifunctional green use of roofs, facades and interior elements as focus

BUS GoCircular aims to grow a green energy workforce within the construction sector. By working collaboratively and upskilling both demand and supply sides of the value chain, an up-to-date skilled workforce can offer the latest solutions and technologies for building construction and refurbishment in order to save energy, increase user comfort and well-being, reduce the maintenance and provide more accurate information for the user.

[busgocircular.eu](http://busgocircular.eu)

ISSO, Netherlands

**Belgium:** Conseil Des Architectes D'europe

**Bulgary:** Fondatsiya Tsentar Za Energiyna Eneffect Efektivnost, Universitet Po Arhitektura Uasg Stroitelstvo

**Czech Republic:** Ceske Vysoke Uceni Technicke V Praze, Institut Cirkularni Ekonomiky Zu

**Germany:** Iclei European Secretariat GmbH.

**Hungary:** Sveuciliste U Zagrebu Gradevinski Fakultet, Emi Epitesugyi Minosegellenorzo Emi Innovacios Nonprofit Kft

**Ireland:** Tus Midwest

**Netherlands:** Stichting Isso , Cooperatieve Circle Economy Ua, Building Changes Support Bv

**Spain:** Instituto Valenciano De La Ive Edificacion, Federacion Valenciana De Fevec Empresarios De La Construcccion



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Mar. 2016**

Duration **36 months**

Status **Completed**

Total budget **2 M€**

# CHARGED

## Enjoy Energy Saving @ Work

Save@W service: (a) monitors energy consumption at the level of circuits (and even appliances) as well as each employee and commonly used facilities or energy consuming devices and infrastructure (e.g. Lifts) and (b) a gamified mobile app attracts and engages employees in energy savings actions by reacting to actual actions.

[www.charged-project.eu](http://www.charged-project.eu)

European Dynamics Belgium SA.

**Germany:** BOSCH Software Innovations

**Greece:** Plegma Labs Technologikes Lyseis Anonymos etaireia, Athens University of Economics and Business, Dimos Athinaion Epicheirisi Michanografisis

**Ireland:** Wattics Limited

**Luxembourg:** National Museum of History and Art

**Spain:** Institut Catala D'ENERGIA

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Jun. 2016**

Duration **40 months**

Status **Completed**

Total budget **3,7 M€**

## Chess Setup

Combined HEat SyStem by using Solar Energy and heaT pUmPs

The Chess Setup project has designed, implemented and promoted a reliable, efficient and profitable system able to supply heating and domestic hot water from renewable sources to both new and existing buildings. It is based on the optimal combination of solar energy production, heat storage and a heat pump in a single system managed by an intelligent monitoring and control system.

[www.chess-setup.net](http://www.chess-setup.net)

Urban Ecology Agency of Barcelona, Spain

France & Spain: Edenway

Germany: Eurogrant

Netherlands: Renne Wansdronk

Spain: Lavola Anthesis, Wattia Innova, Ajuntament de Sant Cugat del Vallès, Veolia Serveis Catalunya

UK: Ulster University, Electric Corby



**CHESS**  
SET UP

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Jul. 2022**

Duration **42 months**

Status **In progress**

Total budget **4,9 M€**

# CHRONICLE

## Building Performance Digitalisation and Dynamic Logbooks for Future Value-Driven Services

CHRONICLE will deliver a holistic, life-cycle performance assessment framework and tool-suite supporting sustainable building design, construction and/or efficient renovation and investment decision making. It will integrate with EPCs, Level(s), SRI, under the umbrella of the Digital Building Logbook concept. Performance will be assessed through static (by design) and dynamic (sensor measurements) KPIs tailored to building types and life-cycle.

[cordis.europa.eu/project/id/101069722](https://cordis.europa.eu/project/id/101069722)

CIRCE, Spain

**Denmark:** FB, EGC, NEOGRID

**Greece:** MYTYLINEOS, HYPERTech, QUE, PRAGMA

**Italy:** R2M Solution, RINA-C

**Ireland:** IES R&D, Ocuallann

**Lithuania:** KTU

**Norway:** SIN

**Spain:** CIRCE, UNE, R2M Solution, ZARAGOZA VIVIENDA

**Switzerland:** HIVE, AEM



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Nov. 2020**

Duration **36 months**

Status **In progress**

Total budget **5,9 M€**

# COGITO

## Construction Phase Digital Twin Model

COGITO will establish a Digital Construction 4.0 toolbox that integrates: reality capture technology to collect data capturing the actual state of operations from construction sites; Building Information Models (BIMs) containing design, planning information augmented with as-built data; innovative integrated data management and software to optimise site operations.

[cogito-project.eu](http://cogito-project.eu)

HYPERTECH, Greece

**Austria:** BOC Asset Management GmbH, Rhomberg Sersa Rail Holding GmbH

**Denmark:** Aarhus Universitet

**Greece:** CERTH, QUE Technologies IKE, Olympia Odos Concession Company S.A.

**Poland:** ASM

**Spain:** Universidad Politécnica de Madrid, Ferrovial

**Slovakia:** Novitech Austria

**U.K.:** UCL, London's Global University, University of Edinburgh



COGITO

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Jun. 2021**

Duration **48 months**

Status **In Progress**

Total budget **4,6 M€**

# COLLECTiEF

## Collective Intelligence for Energy Flexibility

COLLECTiEF aims to implement an interoperable and scalable energy management system to smart up buildings and their legacy equipment on large scale. Enhancing the energy flexibility on both supply and demand sides can boost the movement towards sustainable and resilient urban energy solutions, especially in high-energy dense and heterogeneous urban areas. The project responds to this urgent need to review existing buildings' energy strategy.

[collectief-project.eu](http://collectief-project.eu)

NORGES TEKNISKNATURVITENSKAPELIGE UNIVERSITET NTNU, Norway

**Cyprus:** The Cyprus Institute

**France:** CSTB

**Hungary:** Geonardo Environmental Technologies

**Italy:** CETMA, Energy@Work, LSI Lastem, R2M Solution, Teicos Ue

**Norway:** Alesund Kommune, EM Systemer

**Sweden:** NODA, Lunds Universitet, Virtual Manufacturing



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2019**

Duration **60 months**

Status **In progress**

Total budget **7,9 M€**

## Cultural-E

### Climate and cultural-based solutions for Plus Energy Buildings

Cultural-E is developing technologies and solution sets that are tailorable to specific contexts and energy demands, as well as performing a comprehensive optimisation of the value/cost ratio of Plus Energy Buildings. Sets of design-for-assembly technologies are being developed through a careful mapping of European climates, building archetypes, and cultural energy habits.

[www.cultural-e.eu](http://www.cultural-e.eu)

EURAC, Italy

**Belgium:** ACE

**France:** NOBATEK, Vilogia

**Germany:** USTUTT, SIZ, Wohnbau

**Italy:** EURAC, UNIVE, AbitCOOP, Eurofinestra, Vortice

**Norway:** SINTEF, Baerum Kommune

**Spain:** RMIT, advanticsys

**UK:** Brunel, Ventive



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Sep. 2020**

Duration **36 months**

Status **In Progress**

Total budget **2,9 M€**

## D<sup>2</sup>EPC

### Next-generation Dynamic Digital EPCs for Enhanced Quality and User Awareness

D<sup>2</sup>EPC aspires to deliver the next-generation of dynamic Energy Performance Certificates for the operational and regular assessment of buildings' energy performance through a set of cutting-edge digital design and monitoring tools and services. The aim is to trigger energy-efficient behavioral change and stimulate smart buildings. The D<sup>2</sup>EPC platform will enable the issuance of next-generation EPCs on a regular basis, along with additional services.

[d2epc.eu](http://d2epc.eu)

Centre for Research and Technology Hellas, Information Technologies Institute, Greece

Austria: ASI, AEA

Cyprus: FRC

Germany: CLEO, SEC

Greece: CERTH, GSH, HYP, IsZEB

Lithuania: KTU

Netherlands: DEMO

Spain: SGS, UNE





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Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



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Website

Coordinator

Partners

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Start date **Apr. 2022**

Duration **18 months**

Status **In progress**

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Total budget **0,75 M€**

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## DBL Study

Technical study for the development and implementation of digital building logbooks

The study aims to develop a European model for digital building logbooks (DBLs) to promote tools and protocols that enable the sharing and use of data throughout the construction ecosystem. The development of such a model for DBLs can help to tackle the ecosystem's fragmentation through data sharing, data use, and the organisation of data and by supporting the implementation of DBLs in a harmonious and interoperable way across EU Member States.

[www.researchgate.net/project/Development-and-Implementation-of-Digital-Building-Logbooks-in-the-EU](https://www.researchgate.net/project/Development-and-Implementation-of-Digital-Building-Logbooks-in-the-EU)

Ecorys, the Netherlands

Germany: Contecht

The Netherlands: TNO, Arcadis

**DBL**  
DIGITAL BUILDING  
LOGBOOK

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Sep. 2020**

Duration **36 months**

Status **In Progress**

Total budget **5 M€**

# domOS

## Operating System for Smart Services in Buildings

domOS defines guidelines for an open, secure, privacy-enabled, multi-service IoT ecosystem for smart buildings. IoT platforms and applications operated by different parties can be integrated seamlessly thanks to interoperability standards (e.g. W3C) and to common nomenclatures (e.g. SAREF). Compliant services for energy efficiency, prosumers feedback and flexibility are developed and demonstrated.

[www.domos-project.eu](http://www.domos-project.eu)

Haute Ecole Spécialisée de Suisse Occidentale (HES-SO), Switzerland

**Czech Republic:** FENIX TNT

**Denmark:** Aalborg Universitet (AAU), Neogrid Technologies, Suntherm APS, Aalborg Energi Holding AS (AFE)

**France:** Electricité de France (EDF)

**Slovenia:** INEA DOO

**Switzerland:** Centre Suisse d'Électronique et de Microtechnique (CSEM), aliunid, OIKEN



**domOS**

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Mar. 2016**

Duration **42 months**

Status **Completed**

Total budget **5,1 M€**

## DR-BOB

### Demand Response in Block of Buildings

DR-BOB demonstrated that up to 23% reduction in energy demand and up to 37.5% reduction in the difference between peak and minimum demand is achievable. The project developed a scalable energy management system applicable to blocks of buildings and delivered DR Technology Readiness Levels, a baseline method for DR forecasting and several tested products e.g. the Local Energy Manager.

[cordis.europa.eu/project/id/696114](http://cordis.europa.eu/project/id/696114)

Teesside University, United Kingdom

France: CSTB, Nobatek, GridPocket

Italy: R2M Solution Srl, Fondazione Poliambulanza,

Netherlands: DuneWorks

Romania: Servelect, Universitatea Technica Cluj-Napoca

United Kingdom: Siemens



Energy efficiency



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Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Sep. 2018**

Duration **48 months**

Status **Completed**

Total budget **4,6 M€**

## DRIMPAC

Unified DR interoperability framework enabling market participation of active energy consumers

DRIMPAC developed a unique and universal technological framework that facilitates the end-to-end interoperability between the energy markets and multiple building typologies (covering over 90% of building stock) along with the extraction/delivery of demand flexibility via environmental monitoring and intelligent algorithms, while preserving comfortable and healthy living conditions.

[www.drimpac-h2020.eu](http://www.drimpac-h2020.eu)

CERTH, Greece

Austria: E7

Cyprus: UCY

France: Sorea

Germany: KIT, SWT

Greece: Hypertech

Italy: JRC, STAM SRL

Romania: Siemens SLR

Spain: MyEnergi



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



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Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Dec. 2017**

Duration **36 months**

Status **Completed**

Total budget **3,95 M€**

## DRIVE

Demand Response Integration Technologies: unlocking the demand response potential in the distribution grid

DRivE will unlock the Demand Response potential of residential and tertiary buildings in the distribution grid through a full-fledge platform bridging seamlessly the value-chain from planning and design of assets/buildings towards optimal operations in the next generation Smart Grids, paving the way to a fully deployed DR market in the distribution network.

<https://cordis.europa.eu/project/id/774431>

R2M Solution, Spain

**Belgium:** ENERVALIS, I. LECO

**France:** AIRBUS CYBERSECURITY SAS, CEA

**Italy:** R2M SOLUTION SRL

**Netherlands:** SCHOLT ENERGY

**Spain:** COMSA, TFM ENERGIA SOLAR FOTOVOLTAICA SA, R2M SOLUTION

**Serbia:** Typhoon HIL

**United Kingdom:** BLAENAU GWENT COUNTY BOROUGH COUNCIL, CARDIFF UNIVERSITY



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Coordinator

Partners

Start date **Oct. 2019**

Duration **48 months**

Status **In progress**

Total budget **4 M€**

## DRIVE 0

Driving decarbonization of the EU building stock by enhancing a consumer centred and locally based circular renovation process

Drive 0 aims to make circular renovations more environmentally friendly, cost-effective and attractive for consumers and investors for a better and more sustainable future. What is the Drive 0 definition of a circular renovation? It is a deep renovation based on 100% life cycle renewable energy, and all materials used within the system boundaries are part of infinite technical or biological cycles with the lowest quality loss possible.

[www.drive0.eu](http://www.drive0.eu)

Huygen Installatie Adviseurs, Netherlands

**Belgium:** Architects' Council of Europe, Housing Europe, International Union of Property Owners

**Estonia:** Tallinn University of Technology, Timbeco Woodhouse

**Greece:** National and Kapodistrian University of Athens, SALFO SA

**Italy:** University of Bologna, ALIVA Sistemi per Facciate

**Ireland:** Technological University Dublin, COADY Architects, Vision-Built

**Netherlands:** Huygen Installatie Adviseurs, Zuyd University – Zuyd, ISSO, WEBO, Factory Zero

**Spain:** Valencia Institute of Building, PICH Architects

**Slovenia:** Institute for Innovation and Development of University of Ljubljana, Knauf Insulation d.o.o. Slovenia



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Sep. 2020**

Duration **36 months**

Status **In progress**

Total budget **2,9 M€**

## E-DYCE

### Energy flexible DYnamic building Certification

The E-DYCE vision is to provide an energy performance labeling methodology, that will be closer to building operation condition, and will be able to defend its voluntary status, by the benefits it provides. E-DYCE innovative approach is combined with established and widely available tools, to create a methodology capable of implementing scalable, adaptable and accurate Dynamic Energy Performance Certification.

[edyce.eu](http://edyce.eu)

Aalborg University, Denmark

Denmark: Aalborg University, Neogrid

Greece: EMTECH, CORE

Italy: Politecnico di Torino, Torre Pelice Municipality

Switzerland: ESTIA, OCEN



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Jan. 2015**

Duration **42 months**

Status **Completed**

Total budget **3,4 M€**

## E2VENT

Energy Efficient Ventilated Façades for Optimal Adaptability and Heat Exchange enabling low energy architectural concepts for the refurbishment of existing buildings

The EVENT system is an external thermal building refurbishment module with external cladding and air cavity that embeds an Efficient anchoring system, a Smart Modular Heat Recovery Unit for the air renewal while recovering energy losses and a Latent Heat Thermal Energy Storage based on phase change materials for heating and cooling peak saving. Both controlled on real time by a smart management system.

[www.e2vent.eu](http://www.e2vent.eu)

NOBATEK/INEF4, France

Belgium: European Aluminium

Czech Republic: FENIX TNT

Greece: Aristotelio University of Thessalonikis, ELVAL COLOR

Italia: RINA

Spain: ACCIONA, CARTIF





Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Nov. 2022**

Duration **36 months**

Status **In progress**

Total budget **2 M€**

# EasySRI

Improving and demonstrating the potential of SRI

EasySRI will develop a web platform offering services for automated SRI calculation. It will introduce additional parameters addressing energy efficiency and financial dimensions, while also supporting the implementation of a number of ML services on evaluation and assessment of building system's performance and smartness in more than one normalised metrics, and provide customized recommendations for upgrades, considering the cost of investment.

[webgate.ec.europa.eu/life/publicWebsite/project/details/101077169](http://webgate.ec.europa.eu/life/publicWebsite/project/details/101077169)

CERTH, Greece

Austria: ASI, SERA,

Cyprus: FREDU

Greece: CERTH, CRES

Ireland: WSEE

Italy: CETMA, E@W

Netherlands: DEMO

Spain: SGS



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Feb. 2020**

Duration **42 months**

Status **In Progress**

Total budget **9,5 M€**

## ebalance-plus

Energy balancing, and resilience solutions to unlock the flexibility and increase market options for distribution grid

The ebalance-plus project develops and demonstrates smart-grid solutions (smart storage, V2G systems, SiC power inverters, P2H, control of CHP, IoT-based BMS, and scalable EMS platform) to upgrade buildings. It has also developed distributed energy resources and electric grids for integration in future flexibility markets, along with increasing the distribution grid reliability and resilience. Project demos are in progress in Italy, France, Spain, and Denmark, and testing started end of 2022.

[www.ebalanceplus.eu](http://www.ebalanceplus.eu)

CEMOSA, Spain

**Denmark:** Technical University of Denmark, ENFOR A/S

**France:** JUNIA

**Germany:** IHP, ESCI

**Greece:** EMTECH

**Italy:** University of Calabria

**Poland:** National Information Processing Institute

**Portugal:** MAGNUMCAP

**Spain:** AMPERE, University of Malaga, SOFTCRITS

**Turkey:** REENGEN

**United Kingdom:** TPS



ebalanceplus

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2022**

Duration **36 months**

Status **In progress**

Total budget **5,6 M€**

# EBENTO

## Energy efficiency Building Enhancement through performance guarantee Tools

EBENTO will develop a one-stop-shop platform for all actors involved in building and renovation sector to better manage EPCs. The platform will ensure the exchange of information between actors, making the renovation process cost-efficient and easy replicable. It also will explore the best financing schema to set up energy services, will study how to enhance Energy Performance Contracts linked with flexibility, demand response and comfort.

[ebentoproject.eu](http://ebentoproject.eu)

ETRA I+D, Spain

Austria: JOANNEUM RESEARCH

Estonia: TALTECH

Greece: HYPERTECH, MYTILINAIOS

Netherlands: IECEP

Slovenia: UL, IRI UL

Spain: VCE, CEMOSA

United Kingdom: CARBON CO-OP



# EBENTO

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2020**

Duration **36 months**

Status **In progress**

Total budget **3,6 M€**

## ECO-Qube

### Artificial-Intelligence-Augmented Cooling System for Small Data Centres

The heart of digitisation beats in the data centres. Emerging digital trends – artificial intelligence, augmented reality, virtual reality, Internet of Things – are forcing data centres to be located closer to end users and integrated in existing buildings. ECO-Qube will develop an AI augmented holistic management system for data centres that connects cooling systems, IT loads, and building smart infrastructure enhancing energy efficiency.

[eco-qube.eu](http://eco-qube.eu)

LANDE ENDUSTRIYEL METAL URUNLER SANAYI VE TICARET AS, Turkey

Germany: SDIA

Netherlands: Gita Amsterdam, Blockheating

Spain: R2M Solution

Sweden: Lulea Technical University

Switzerland: EMPA, Helio AG

Turkey: Lande, D&S Tech, Endoks, Bitnet



ecoqube

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Jan. 2019**

Duration **52 months**

Status **In progress**

Total budget **4,27 M€**

# ENERGE

## Energizing Education to Reduce Greenhouse Gas Emissions

ENERGE aims to reduce energy consumption and greenhouse gas emissions in the school sector through a combination of physical interventions, behavioural studies and educational approaches. ENERGE targets the entire secondary school eco-system and empowers school communities to make meaningful reductions in energy use by making changes in behaviors and operations. 13 secondary schools across Europe assist in the design of the ENERGE proposition.

[www.nweurope.eu/energe](http://www.nweurope.eu/energe)

National University of Ireland Galway, Ireland

**France:** Centre-Val de Loire Region, LAVUE-CNRS

**Germany:** Trier University of Applied Sciences

**Luxembourg:** University of Luxembourg

**Netherlands:** Delft University of Technology

**Northern-Ireland:** CASTel Dublin City University

**United Kingdom:** R2M Solution LTD



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Jan. 2021**

Duration **49 months**

Status **In progress**

Total budget **10,1 M€**

# ENSNARE

## ENvelope meSh aNd digitAl framework for building RENovation

ENSNARE focuses on:

1. Envelope modular mesh, facilitating assembly and interconnection of components and networks. It allows integration of the building components being developed: i) Industrialized modular façade panels ii) Integrated renewable solar systems, iii) Smart multifunctional window
2. Digital platform supporting all renovation stages. Solutions include: i) Automated data acquisition, ii) Early decision support, iii) Smart BEMS, iv) Digital Twin.

[www.ensnare.eu](http://www.ensnare.eu)

TECNALIA, Spain

Bulgaria: Balkanika

Denmark: SUNTHERM

Estonia: Tartu

Finland: OneClickLCA

France: Nobatek

Germany: TUM

Hungary: ABUD

Ireland: IES

Italy: CIVIESCO, COAF, UNIPD

Macedonia: KAMEL

Netherlands: TRESPA, TUDelft

Spain: TEC, RIVENTI, Onyx, ENAR, R2M Spain



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Jun. 2020**

Duration **36 months**

Status **In Progress**

Total budget **2,7 M€**

## ePANACEA

### Smart European Energy Performance Assessment And Certification

ePANACEA develops a holistic methodology for energy performance assessment and certification of buildings. ePANACEA comprises the creation of a prototype (the Smart Energy Performance Assessment Platform) making use of the most advanced techniques in dynamic and automated simulation modelling, big data analysis and machine learning, inverse modelling or the estimation of potential energy savings and economic viability check.

[epanacea.eu](http://epanacea.eu)

CENER, Spain

Austria: EAST, TUWIEN

Belgium: VITO

Finland: VTT

Germany: IZES

Greece: CRES, SYMPRISIS

Spain: IDAE, EFINOVATIC, CENER



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Sep. 2019**

Duration **40 months**

Status **In Progress**

Total budget **1,3 M€**

# EPC4SES

## EPC based Digital Building Twins for Smart Energy Systems

Utilising data from the energy performance certification, digital twins of buildings were erected. Adding weather nowcasts, the energy demand can be reduced upfront of solar or wind peaks, depending on the used energy source. For buildings, the heating demand is reduced by lowering the set temperature if solar gains are envisaged. The project was able demonstrate significant savings are to be expected with minimum investment in IOT.

[epc4ses.eu](http://epc4ses.eu)

effiziente.st Energie- und Umweltconsulting e.U., Austria

Austria: effiziente.st, FH Salzburg

Germany: SEnerCon GmbH, Cleopa GmbH

Norway: WRNI

Spain: WTG Wellness Telecom Group

**EPC4SES**  
Digital Building Twins



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Sep. 2020**

Duration **40 months**

Status **In Progress**

Total budget **2,8 M€**

## EPC RECAST

New toolbox to assess building energy performance and retrofit needs

EPC RECAST sets a well-structured process and a toolbox supporting the evolution of the Energy Performance Assessment and Certification (focus on existing residential buildings). By enhancing EPCs usability, reliability, and comparability, and by linking them to renovation roadmaps and building digital notebooks, EPC RECAST can achieve unprecedented user-friendliness and user awareness about building performance.

[epc-recast.eu](http://epc-recast.eu)

CSTB, France

Belgium: REHVA

France: Bimeo, CSTB, EDF, ENGIE

Germany: Fraunhofer

Italy: Politecnico Milano, R2M Solution Srl

Luxembourg: LIST

Slovakia: ENBEE

Spain: Tecnalia

**EPC RECAST**  
ENERGY PERFORMANCE  
CERTIFICATE RECAST

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2017**

Duration **45 months**

Status **Completed**

Total budget **2 M€**

## eTEACHER

end-users Tools to Empower and raise Awareness of Behavioural CHange towards EnerGy efficiency

eTEACHER aims to empower building users to achieve energy savings and improve comfort conditions. The solution is a set of ICT tools that collect data from buildings and users by an universal communication interface. This then processes data in several cloud services and provide tailored recommendations and information through an App that integrates gamification techniques and encourages behavioural change.

[www.eteacher-project.eu](http://www.eteacher-project.eu)

CEMOSA, Spain

**Finland:** Granlund Oy

**Germany:** ASCORA GMBH, IFM Software GMBH, Fraunhofer Gesellschaft zur Foerderung Der Angewandten Forschung E.V, Steinbeiz Innovation GMBH

**Italy:** Fondazione Icons

**Romania:** ICPE SA

**Spain:** CEMOSA, Agencia Extremeña de la Energia, Laura Otero Insatalaciones

**United Kingdom:** De Monfort University, Nottingham City Council



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Sep. 2019**

Duration **48 months**

Status **In Progress**

Total budget **7,9 M€**

# EXCESS

## FleXible user-CEntric Energy positive houseS

EXCESS showcases how to transform nearly-zero energy buildings into positive energy buildings (PEB). In four demonstration projects in Spain, Austria, Belgium & Finland, EXCESS introduces technical solutions enabling buildings to produce more renewable energy than they consume in different climate zones. With its demo projects EXCESS seeks to test, validate, share and replicate PEB solutions across Europe.

[positive-energy-buildings.eu](http://positive-energy-buildings.eu)

Joanneum Research Forschungsgesellschaft mbH, Austria

**Australia:** Joanneum Research Forschungsgesellschaft mbH, AEE - Institute for Sustainable Technologies, BAR Vermögensverwaltungs GmbH, Thomas Schwarzl IT, NETxAutomation Software GmbH

**Belgium:** VITO, Prospex institute, Cordium Cvba

**Cyprus:** Suite5

**France:** DualSun

**Finland:** VTT, Gebwell Oy, Basso Building Systems Oy, Tom Allen Senera Oy

**Greece:** CGSoft

**Germany:** ICLEI Europe - Local Governments for Sustainability

**Spain:** CENER National Renewable Energy Centre of Spain, Agencia

Andaluza de la Energia – AAE, TRYCSA, Urb-atelier

**United Kingdom:** MuoviTech



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **May 2022**

Duration **30 months**

Status **In progress**

Total budget **1 M€**

# FinSESCO

Fintech Platform Solution for Sustainable Energy System Intracting and Contracting, boosting energy saving and renewable energy

End to end digitalisation of the energy contracting and intracting process is developed, boosting the energy transition and renovation wave. Starting with data from the energy performance certification of buildings, a playful investing approach and meter based energy monitoring systems are adapted to regional markets and tested in pilots.

[finsesco.eu](https://finsesco.eu)

effiziente.st Energie und Umweltconsulting, Austria

Austria: effiziente.st

Germany: SEnerCon, EUV

India: Anna University, VIT, qigrid

Romania: BEIA

Spain: WTG

**FinSESCO**

Fintech for Smart Energy System Contracting

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2022**

Duration **36 months**

Status **In progress**

Total budget **9,5 M€**

# FORTESIE

CBDC powered Smart PerFORrmanCe contractTs for Efficiency, Sustainable, Inclusive, Energy use

FORTESIE designs, demonstrates, validates and replicates innovative renovation packages in the building industry with Smart Performance-Based guarantees and financing, aiming at Efficient, Sustainable and Inclusive Energy use to accelerate the Renovation Wave in Europe. Packages combine construction materials and technologies, digital measurement and verification of improvements, and attractive financing schemes, to raise EPC value proposition.

[fortesie.eu](https://fortesie.eu)

European Dynamics Luxembourg SA., Luxembourg

**France:** 450 SAS (Compte CO2), Oktavia

**Germany:** Gottfried Wilhelm Leibniz Universität Hannover - Institut for Legal Informatics

**Greece:** European Dynamics Greece, SA, National Technical University of Athens, TG Technici MIKE, Social Open and Inclusive Innovation, Engie Hellas AE (CORDIA), General Secretariat of Information Systems for Public Administration, Society for hellenism and philhellenism, Ministry of Economics

**Latvia:** Latvian Environmental Investment Fund, Mesh Energoparvaldiba SIA

**Luxembourg:** European Dynamics Luxembourg SA.

**Netherlands:** Institute for European Energy and Climate Policy

**Norway:** Smart Innovation Norway SA

**Poland:** Gmina Góra Kalwaria, +48 Architektura s.c

**Portugal:** Coopérnico - Cooperativa de Desenvolvimento Sustentável, Power Parity S.A., Associação Just a Change

**Slovakia:** Association of energy service providers), Energy Center Bratislava

**Spain:** Fundacion Ctic Centro Tecnologico Para El Desarrollo En Asturias De Las Tecnologias De La Information, Veolia, Fundacion Agencia Local De La Energia Del Nalon, Construcciones Garcia Rama



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Jun. 2020**

Duration **42 months**

Status **In Progress**

Total budget **5,1 M€**

## frESCO

New business models for innovative energy service bundles for residential consumers

frESCO aims to engage with ESCOs and aggregators and enable the deployment of innovative business models on the basis of novel integrated energy service bundles that properly combine and remunerate local flexibility for optimizing local energy performance both in the form of energy efficiency and demand side management under common Pay for Performance Contracts.

[www.fresco-project.eu](http://www.fresco-project.eu)

CIRCE, Spain

Austria: EI-JKU

Belgium: UBE

Croatia: KONCAR DIGITAL, SIK

Cyprus: S5

France: VOLT

Greece: UBITECH, MOH, IOSA

Italy: RINA-C

Spain: CARTIF, LCTE, COMSA



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **May 2018**

Duration **54 months**

Status **Completed**

Total budget **9,9 M€**

# GEOFIT

Deployment of novel GEOthermal systems, technologies and tools for energy efficient building retroFITting

GEOFIT is an integrated industrially driven action deploying cost-effective shallow geothermal solutions for energy efficient building retrofitting, developing innovative system components including but not limited to non-standard heat exchanger configurations, a novel hybrid heat pump, and a suite of heating and cooling components, all to be integrated at system level and designed to be applied in energy efficient building retrofitting projects.

[geofit-project.eu](http://geofit-project.eu)

R2M Solution, Italy

**Austria:** OCHSNER, Austrian Institute of Technology

**Belgium:** i.LECO

**Germany:** FAHRENHEIT

**Finland:** UPONOR

**France:** NOBATEK INEF-4

**Italy:** R2M Solution, CNR-ITAE, University of Perugia, IDS Georadar, SIART, CAREL

**Ireland:** NUI Galway, CFO

**Spain:** IDP, COMSA, Sant Cugat, CDP, EURECAT, COMET, UNE

**Sweden:** KTH, LTU

**Netherlands:** Groenholland



**G E O F I T**<sup>®</sup>  
SMART GEOTHERMAL

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2017**

Duration **54 months**

Status **Completed**

Total budget **6,6 M€**

# HEART

## Holistic Energy and Architectural Retrofit Toolkit

The HEART toolkit incorporates different components and technologies, which cooperate to transform an existing building into a smart building. In developing this toolkit, the project advances and improves energy efficiency and the use of renewable energies in buildings across Europe.

[heartproject.eu](http://heartproject.eu)

Politecnico de Milano, Italy

**Austria:** Heliotherm

**Belgium:** REVOLVE, Housing Europe

**Croatia:** Stille Group

**France:** Est Métropole Habitat, ENTPE

**Italy:** EURAC Research, ACER, ZH

**Slovenia:** University of Ljubljana

**Spain:** CTIC, Garcia Rama

**Switzerland:** Quantis

**United Kingdom:** TPS, University of Southampton





Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2016**

Duration **56 months**

Status **Completed**

Total budget **7,9 M€**

## Heat4Cool

Smart building retrofitting complemented by solar assisted heat pumps integrated within a self-correcting intelligent building energy management system

The Heat4Cool concept proposes innovative, efficient and cost-effective solutions that support EU energy efficiency policies through an optimal integration of relevant rehabilitation systems. The project develops, integrates and demonstrates an easy to install and highly energy efficient solution for building retrofitting. Heat4cool implement four benchmark retrofitting projects in four different European climates.

[www.heat4cool.eu](http://www.heat4cool.eu)

Politecnico di Milano - Department of Energy, Italy

Belgium: EHPA

Bulgaria: BALKANIKA

Germany: FAHRENHEIT

Greece: WATT + VOLT

Hungary: Thermowatt Ltd.

Poland: IZNAB SP

Spain: TECNALIA, SOLINTEL, SYMELEC

Switzerland: HOCHSCHULE LUZERN

United Kingdom: Sunamp Ltd, AES Ltd



HEAT4COOL

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Sep. 2015**

Duration **48 months**

Status **Completed**

Total budget **7,9 M€**

# HIT2GAP

Highly Innovative building control Tools Tackling the energy performance GAP

The HIT2GAP project has developed a new generation of building monitoring and control tools based on advanced data treatment techniques allowing new approaches to reduce the energy performance gap. HIT2GAP solution builds on existing measurement and control services that are embedded into a new open source software platform for performance optimization called BEMServer.

[cordis.europa.eu/project/id/680708](http://cordis.europa.eu/project/id/680708) [www.bemserver.org](http://www.bemserver.org)

NOBATEK/INEF4, France

**Cyprus:** Cyric LTD

**France:** Bouygues Energies&Services, Université de Pau et des Pays de l'Adour, Evolution

**Germany:** Fraunhofer ISE

**Greece:** Apintech

**Ireland:** University of Galway, Cylon Controls, Enerit, Zutec

**Italy:** R2M Solution Srl, Abo Data

**Poland:** City of Warsaw, Mostostal

**Spain:** EURECAT, University of Girona, IK4-Tekniker, Giroa

**Turkey:** Ege University

**United Kingdom:** Building Research Establishment, University of Strathclyde



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2017**

Duration **42 months**

Status **Completed**

Total budget **5 M€**

# HOLISDER

Integrating Real-Intelligence in Energy Management Systems enabling Holistic Demand Response Optimization in Buildings and Districts

HOLISDER introduces a Holistic DR Optimization Framework that enables significant energy cost reduction at building/consumer side. Additionally, small and medium sized buildings are introduced as major contributors to maintain the energy networks' stability in response to network constraints and conditions through deployment of implicit and hybrid DR schemes and optimized energy management.

[holisder.eu](http://holisder.eu)

TECNALIA Research & Innovation, Spain

Croatia: Koncar

Czech Republic: HONEYWELL

Finland: CAVERION

Greece: HYPERTECH, MYTILINEOS

Netherlands: TNO

Poland: ASM

Serbia: Belit, Beogradske Elektrane

Spain: ETRA I+D, Solintel

United Kingdom: KiWi Power



HOLISDER

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Dec. 2018**

Duration **27 months**

Status **Completed**

Total budget **1 M€**

# Homes4Life

Certified smart and integrated living environments for ageing well

A huge share of the building stock is not adapted to permit us to age in our homes. Homes4Life addressed this challenge by defining the Homes4Life certification scheme to tackle end-users' needs and requirements through a life-course approach ensuring our homes support our changing needs and lifestyles as we move forward in life and allow us to stay active, participate in society and protect our health.

[www.homes4life.eu](http://www.homes4life.eu)

TECNALIA, Spain

**Belgium:** Eurocarers, ECTP, AGE Platform Europe

**France:** Certivea, R2M Solution

**Italy:** Universita Politecnica Delle Marche

**Netherlands:** TNO, Uuniversiteit Utrecht



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2017**

Duration **54 months**

Status **Completed**

Total budget **6 M€**

# HYBUILD

Innovative compact hybrid storage systems for low energy buildings

HYBUILD developed two innovative compact hybrid electrical/thermal storage systems for buildings: one for the Mediterranean climate primarily meant for cooling energy provision, and one for the Continental climate primarily meant for heating and DHW production. The overall solution is controlled by a Smart Building Energy Management System (Smart BEMS).

[hybuild.eu](http://hybuild.eu)

COMSA, Spain

**Austria:** AIT, FRESNEX GMBH, Ochsner Wärmepumpen GMBH, PINK GMBH

**Cyprus:** Municipality of Aglantzia, University of Cyprus

**Czech Republic:** Mikrometal Sro

**France:** R2M Solution, NOBATEK/INEF4

**Germany:** AKG Verwaltungsgesellschaft, Fahrenheit

**Greece:** Daikin Air-conditioning Hellas SA, NTUA

**Italy:** EURAC, CNR, Engineering – Ingegneria Informatica Spa, STRESS

**Spain:** Ajuntament almatret, Universidad de Lleida (UdL)

**Switzerland:** CSEM



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Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



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**Website**

**Coordinator**

**Partners**

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Start date **Jun. 2020**

Duration **42 months**

Status **In Progress**

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Total budget **4,9 M€**

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## **iBECOME**

Intelligent building asset control for comfort, energy and flexibility optimisation

iBECOME offers a paradigm shift in building energy efficiency by utilising IoT big data and advanced analytics. The project will demonstrate the functionality and viability of a virtual BMS platform deployed as a SaaS solution that can optimise the energy performance, comfort conditions and flexibility potential of buildings and facilities while allowing 3rd parties to interconnect for providing other energy or non-energy related services

**[ibecome-project.eu](http://ibecome-project.eu)**

**IES R&D, Ireland**

**Ireland:** IES R&D, IRISH MANUFACTURING RESEARCH, ELECTRICITY EXCHANGE

**Italy:** CIVIESCO, RINA CONSULTING, SCHNEIDER ELECTRIC, ENER.GI

**France:** EOLYA, CEA

**UK:** IES LTD

**iBECOME**

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Jul. 2022**

Duration **48 months**

Status **In progress**

Total budget **9,9 M€**

# INCUBE

An INClUsive toolBox for accElerating and smartening deep renovation

InCUBE envisions to unlock the EU renovation wave through cutting-edge standardised, lean integrated processes based on 4 key pillars of innovation: 1) Industrialisation; 2) Novel renewable power producing and storage technologies; 3) Digitalisation; and 4) New market entrants.

The InCUBE Suite, integrates digital tools across all 4 pillars at different renovation phases to accommodate tenants' comfort and render buildings active energy nodes.

[cordis.europa.eu/project/id/101069610](https://cordis.europa.eu/project/id/101069610)

CERTH, Greece

Belgium: REHVA

France: KENT

Greece: CERTH, IsZEB

Italy: LAMA, TRE, FBK, RINA-C, TEGOLA, TERA, EVOLVERE, ENEREN

Netherlands: VW, LEFIER, NEC, WEBO

Poland: K-FLEX

Spain: ITeC, ZAVI, CIRCE, METRO7, ESTUDIO, ABORA, KOVER, EDPS



**InCUBE**  
sustainable building innovations

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2019**

Duration **48 months**

Status **In Progress**

Total budget **36 M€**

# InterConnect

## Interoperable Solutions Connecting Smart Homes, Buildings and Grids

InterConnect is the name of the project that gathers 51 European entities to develop and demonstrate advanced solutions for connecting and converging digital homes and buildings with the electricity sector. The main goal? Bringing efficient energy management within reach of the end-users by interoperable Solutions Connecting Smart Homes, Buildings and Grids.

[www.interconnectproject.eu](http://www.interconnectproject.eu)

INESC TEC, Portugal

**Austria:** cyberGRID

**Belgium:** VITO, Th!nk E, ThermoVault, Vrije Universiteit Brussel, IMEC, DuCoop, 3E, CORDIUM CVBA, RDGf, EDSO, OpenMotics, ABB, Daikin Europe, KNX

**France:** YNCREA Mediterranee, TRIALOG, ENEDIS, ENGIE, SENSINOV

**Germany:** EEBUS, Fraunhofer IEE, KEO GMBH, UNI KASSEL, DFKI, Fh-Dortmund, BSH, Miele, Wirelane GmbH, Vaillant GmbH

**Greece:** Wings ICT Solutions, GridNet, Athens University of Economics and Business – Research Center, HERON, COSMOTE

**Italy:** Planet Idea, Whirlpool, RSE SPA, POLIMI

**Netherlands:** TNO, VolkerWessels iCITY, Stichting VU

**Poland:** FundingBox

**Portugal:** INESC TEC, EDPD, SONAE, Domótica SGTA, Schneider Electric Portugal Lda

**Serbia:** VizLore

**Slovenia:** Elektro Ljubljana

# interconnect



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

## LIFE-SBE4LCHCB

### Smart Building Envelope for Low Carbon and High Comfort Buildings

The LIFE-SBE4LCHCB project aims at developing a universal and affordable low-carbon solution that can be implemented on every new building constructed in the EU. ecoXia will demonstrate its innovative low-carbon building concept that includes studies and construction of new buildings in France. The Smart Building Envelope (SBE) is designed as a complete system that incorporates natural materials and very effective insulation.

[www.ecoxia.fr](http://www.ecoxia.fr)

ecoXia SAS, France

France: ecoXia SAS

Start date **Jun. 2020**

Duration **36 months**

Status **In Progress**

Total budget **1,3 M€**



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Nov. 2016**

Duration **48 months**

Status **Completed**

Total budget **3,7 M€**

## LowUP

LOW valued energy sources  
UPgrading for buildings and  
industry uses

The project developed and demonstrated three new efficient heating and cooling technologies that significantly reduce both CO2 emissions and primary energy consumption. All three systems combine innovative heat and cool recovery technologies fueled by low valued energy sources. These include both renewable and wasted energy sources.

[lowup-h2020.eu](http://lowup-h2020.eu)

ACCIONA, Spain

**Austria:** Tisun GmbH

**Finland:** Halton Oy, Wasenco Oy

**France:** Lgi Consulting

**Italy:** Pozzi Leopoldo Srl, Rdz Spa

**Netherlands:** Gea Refrigeration Netherlands Nv

**Spain:** Endef Engineering Sl, Fundacio Eurecat, Fundacion Cartif, Fundacion Tecnalia Research & Innovation

**Switzerland:** Fafco Sa



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2020**

Duration **36 months**

Status **In Progress**

Total budget **4,6 M€**

# MATRYCS

## Modular Big Data Applications for Holistic Energy Services in Buildings

Unlocking Big Data for Energy-Efficient Building Management and Policy Making. MATRYCS elevates building energy management to a new level through improved building data processing, analysis and aggregation. The project tests new ways of building data collection, connects data sets from different platforms for Big Data analytics, and makes them accessible and visually appealing to decision makers.

[matrycs.eu](http://matrycs.eu)

ENGINEERING - INGEGNERIA INFORMATICA, Italy

**Belgium:** Housing Europe

**Czech Republic:** SEVEN - The Energy Efficiency Center

**Germany:** RWTH Aachen University, ICLEI European Secretariat

**Greece:** National Technical University of Athens, HOLISTIC

**Italy:** Eurac Research, ASM TERNI

**Latvia:** Latvian Environmental Investment Fund

**Poland:** FASADA, Gdynia Municipality

**Portugal:** Coopérnico

**Slovenia:** BTC Company, ComSensus

**Spain:** Fundación CARTIF, Veolia, Ente Público Regional De La Energia De Castilla Y León



MATRYCS

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Jan. 2019**

Duration **40 months**

Status **In Progress**

Total budget **7,4 M€**

# MERLON

## Integrated Modular Energy Systems and Local Flexibility Trading for Neural Energy Islands

The de-centralization of electricity generation requires equally de-centralized and affordable solutions to integrate more RES, increase security of supply and decarbonize the EU energy future. MERLON introduces an Integrated Local Energy Management Framework for the Holistic Optimization of Local Energy Systems to support grid stability in presence of high shares of volatile distributed RES.

[www.merlon-project.eu](http://www.merlon-project.eu)

Hypertech, Greece

**Austria:** Energie Gussing Gmbh, Europaisches Zentrum Fur Erneuerbare Energie Gussing Gmbh

**Cyprus:** Suite5 Data Intelligence Solutions Limited

**Greece:** Xorotexniki Anonymo Texniko Etaireia, University Of Peloponnese, Merit Consulting House - Olokrromenes Symvouleftikes Ipiresies Epixeiriseon Idiotiki Kefalaioxiki Etaireia

**Spain:** Atos Sa, Cobra Instalaciones Y Servicios S.A, Etra Investigacion Y Desarrollo Sa, Cooperativa Electrica Benefica San Francisco De Asis Sociedad Cooperativa Valenciana

**United Kingdom:** Imperial College of Science Technology And Medicine, University Of Newcastle Upon Tyne



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Nov. 2019**

Duration **62 months**

Status **In Progress**

Total budget **8,5 M€**

# MiniStor

## Minimal Size Thermal and Electrical Energy Storage System for In-Situ Residential Installation

MiniStor aims at designing and producing a novel compact integrated storage system for achieving a sustainable heating, cooling and electricity storage adaptable to residential buildings. The system is constituted by a thermochemical reactor, hot and cold phase-change materials, Li-ion batteries responsive to grid signals and renewable sources such as hybrid photovoltaic thermal panels, and it is managed by a smart Home Energy Management System.

[ministor.eu](http://ministor.eu)

International Energy Research Centre (IERC), Ireland

France: CNRS-PROMES, Sofrigam

Greece: DUTH, CERTH, Psycrotherm

Hungary: EMI, Woodspring

Ireland: CORKCITY

Italy: R2M, Enetech

Poland: Enetech

Spain: CARTIF, ENDEF, FEUGA, SGS TECNOS, USC

Switzerland: HSLU



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Jun. 2022**

Duration **48 months**

Status **In progress**

Total budget **5,5 M€**

# MODERATE

## Marketable Open Data Solutions for Optimized Building-Related Energy Services

MODERATE enables uniform access to heterogeneous data sources on buildings' performance, usually dispersed in non-interoperable data silos. It develops techniques to enable building owners, policy makers, facility managers, utility companies (etc.) to openly share their data, gain insights, and make decisions compliant with regulations (e.g. GDPR). MODERATE exploits a set of open-source components such as open-data nodes, data-syntheticization algorithms, and data-driven services for improving building performance.

[moderate-project.eu](https://moderate-project.eu)

EURAC, Italy

**Austria:** TU Wien, E-Think Zentrum für Energiewirtschaft und Umwelt

**Belgium:** Univ. Catholique de Louvain, VITO, REHVA

**Germany:** IOTA Stiftung, Köhler & Meinzer Gmbh, Synavision Gmbh

**Italy:** Univ. Ca' Foscari Venezia, Würth Srl-Gmbh

**Netherlands:** Huygen Ingenieurs & Adviseurs B.V

**Spain:** CTCI, VEOLIA, Instituto Valenciano de la edificación IVE, Enercoop

Cooperativa electrica benefica san Francisco de Asis Soc.Coop. Valenciana



**MODERATE**

Marketable Open Data Solution for Optimized Building-related Energy Services

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Dec. 2014**

Duration **54 months**

Status **Completed**

Total budget **4,4 M€**

## MORE-CONNECT

Development and advanced prefabrication of innovative, multifunctional building envelope elements for MODular RETrofitting and CONNECTIONS

MORE-CONNECT developed prefabricated multifunctional renovation elements by the development and demonstration of 1) Cost optimal deep renovation solutions with the possibility of customized features 2) Prefabricated multifunctional modular renovation elements in series of 1 in a mass production process 3) New fully automated production lines for multifunctional modular renovation elements and 4) One-stop-shops.

[www.more-connect.eu](http://www.more-connect.eu)

Huygen, Netherlands

**Czechia:** Czech Technical University in Prague, RD Rýmařov

**Denmark:** Cenergia, Innogie ApS, Invela ApS

**Estonia:** Tallinn University of Technology, AS Matek, REF Ehitustööd

**Latvia:** Riga Technical University, Wood Construction Cluster, Technological Centre of Zemgale

**Netherlands:** Huygen Installatie Adviseurs, Zuyd University, BJW, WEBO

**Portugal:** University of Minho, Darkglobe

**Switzerland:** Econcept



MORE—  
CONNECT

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Sept. 2015**

Duration **42 months**

Status **Completed**

Total budget **4,7 M€**

# OptEEmALE

## Optimised Energy Efficient Design Platform for Refurbishment at District Level

OptEEmAL developed an Optimised Energy Efficient Design Platform for refurbishment at district level, which delivers an optimised, integrated and systemic design based on an Integrated Project Delivery (IPD) approach for smart building and district retrofitting projects, reducing time delivery and uncertainties, resulting in improved solutions when compared to business-as-usual practices.

[www.opteemal-project.eu](http://www.opteemal-project.eu)

FUNDACION CARTIF, Spain

France: Nobatek

Germany: Steinbeis

Greece: TUC

Ireland: UTRC (Collings Aerospace Ireland)

Italy: Expert Systems, Distrito Technological Trentino

Spain: CARTIF, TECNALIA, ACCIONA, FUNITEC, Fomento San Sebastian

Sweden: Lunds Kommun

Turkey: ARGEDOR





Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Sep. 2016**

Duration **54 months**

Status **Completed**

Total budget **5,3 M€**

## P2Endure

Plug-and-Play product and process innovation for Energy-efficient building deep renovation

Give evidence of the innovative added value of Plug-and-Play solutions for deep renovation.

Technical goals: Implement a new 4M Methodology for PnP deep renovation. Ensure the readiness of PnP solutions (building envelope and Technical Systems retrofits). Configure and use supporting ICT tools (BIM, BEM, software tools). Demonstrate in real deep renovation projects.

[p2endure-project.eu](http://p2endure-project.eu)

DEMO Consultants, The Netherlands

**Denmark:** Invela

**Germany:** 3L-Plan Lenze-Luig Architects, Fermacell GmbH, Technischen Universität Berlin

**Italy:** Becquerel Electric S.r.l., SGR Servizi S.p.A., RINA Consulting S.p.A., Università Politecnica delle Marche

**Poland:** Bergamo Tecnologie SP Z.O.O., Fasada, Mostostal Warszawa S.A., Miasto Stoleczne Warszawa

**Netherlands:** Huygen Installatie Adviseurs, Panplus architectuur, Camelot Vastgoed Nederland BV

 P2ENDURE

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2019**

Duration **42 months**

Status **In Progress**

Total budget **9,4 M€**

## PARITY

Pro-sumer AwaRe, Transactive Markets for Valorization of Distributed flexibilitY enabled by Smart Energy Contracts

PARITY delivers a unique local flexibility market platform which seamlessly integrates IoT and blockchain technologies. By delivering a market for automated flexibility exchange based on smart contracts & blockchain, PARITY will facilitate transparent local flexibility transactions under real-time grid operational constraints and available DER flexibility to increase grid durability and efficiency.

[parity-h2020.eu](http://parity-h2020.eu)

CERTH, Greece

Austria: E7

Belgium: MERIT

Cyprus: UNICOSIA

Greece: Hypertech, Que, BFS, HEDNO

Spain: Circe, Cuerva, Urbener, UDEUSTO

Sweden: CWATT, E.ON

Switzerland: AEM, SUPSI, HIVE



P A R I T Y

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Sep. 2020**

Duration **36 months**

Status **In Progress**

Total budget **5,2 M€**

## PHOENIX

Adapt-&-Play Holistic cOst-Effective and user-frieNDly Innovations with high replicability to upgrade smartness of eXisting buildings with legacy equipment

PHOENIX will design the necessary hardware and software upgrades and make use of artificial intelligence technologies as well as edge/cloud computing methods to transform existing buildings into smart buildings. The project's key deliverable will be a portfolio of ICT solutions capable of providing intelligence to legacy systems and appliances in existing buildings.

[eu-phoenix.eu](http://eu-phoenix.eu)

University of Murcia, Spain

**Austria:** Siemens

**Cyprus:** Suite5

**Greece:** Kataskevastiki Makdeonias, Elin Verd, UBITECH, Merit Consulting House

**Ireland:** Arden Energy

**Spain:** ODIN SOLUTIONS S.L., MIWenergia

**Sweden:** SKEBIT, Lulea University of Technology



PHOENIX

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2020**

Duration **48 months**

Status **In Progress**

Total budget **9,7 M€**

# PLURAL

## Plug-and-Use renovation with adaptable lightweight systems

PLURAL designs, validates and demonstrates a palette of versatile, adaptable, scalable, off-site prefabricated Plug-and-Use kits integrating renewable energy generation and smart control for residential building deep renovation. Optimal component selection, design, faster and low-cost manufacturing and installation are enabled via a BIM based platform and a Decision Support Tool.

[www.plural-renovation.eu](http://www.plural-renovation.eu)

NTUA, Greece

**Germany:** ZRS Architekten Gesellschaft Vonarchitekten mbH

**Greece:** Proigmenes Erevnitikes & Diahistikes Efarmoges. Dimos Varis – Voulas – Vouliagmenis, Daikin Airconditioning Hellas SA

**Czech Republic:** Fenix Tnt Sro, Obec Kasava, Ceske Vysoke Uceni Technicke V Praze, Recuair S.R.O., Rd Rymarov SRO Luxembourg; Intrasoft International SA

**Poland:** Bergamo Technologie SPZOO

**Spain:** Institut De Tecnologia De La Construccio De Catalunya, Pich-Aguilera Arquitectos SL, Fundacio Institut De Recerca De L'energia De Catalunya, Agencia De L'habitatge De Catalunya, Denvelops Textiles SL

**Switzerland:** HSR Hochschule Fur Technik Rapperswil



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2020**

Duration **36 months**

Status **In Progress**

Total budget **7,65 M€**

# PRECEPT

A novel decentralized edge-enabled PREsCriptivE and ProacTive framework for increased energy efficiency and well-being in residential buildings

PRECEPT will facilitate the smooth and almost zero operational costs transformation of conventional residential buildings into highly efficient proactive residential buildings. It is tapping into this new framework and is proposing a Pred(scr)active and Proactive Building Energy Management System (PP-BMS). The project will develop new sustainable business models for transforming traditional reactive buildings into proactive buildings.

[precept-project.eu](http://precept-project.eu)

WVT, Greece

Greece: CERTH

Lithuania: KTU

Cyprus: FRC

Germany: CLEOPA, NUROMEDIA, CON

Spain: Odins

Netherlands: DEMO Consultants

Austria: ASI

Hungary: LCII

Ukraine: PSACEA, STROITEL-P

Spain: MIWENERGIA

Italy: Polimi



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Dec. 2020**

Duration **42 months**

Status **In Progress**

Total budget **9,7 M€**

# PRELUDE

## Prescient building Operation utilizing Real Time data for Energy Dynamic Optimization

PRELUDE comprises three main components:

i) data acquisition layer (data is collected and aggregated), ii) middleware - a modular, multisimulation dataspace hosting data and technology enablers, iii) proactive agents featuring assessment, optimization and controls.

The developed platform envisions to provide comprehensive building assessment by technology enablers which receive data from the middleware and not single building.

[prelude-project.eu](http://prelude-project.eu)

AAU, Denmark

**Austria:** Forschung Burgerland GMBH

**Belgium:** EUROOC

**Denmark:** Aalborg University

**Finland:** Tampere University

**Greece:** EMTECH, CORE, LIBRA, DAEM

**Italy:** Politecnico di Torino, Unismart Padova Enterprise, IREN, STAM, LASIA

**Poland:** BLOK ARCHITEKCI

**Spain:** AIMEN, TREE, IAI, INCOTEC

**Switzerland:** ESTIA, CPEG

**UK:** Brunel University



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Jan. 2016**

Duration **54 months**

Status **Completed**

Total budget **8,5 M€**

## PVSITES

Building-Integrated photovoltaic technologies and systems for large-scale market deployment

The main objective of PVSITES project is to pave the way towards a large market deployment of BIPV technology by demonstrating an ambitious portfolio of building-integrated solar technologies and systems. The project activities are focused on providing a forceful, reliable answer to the market requirements identified by the industrial members of the consortium in their day-to-day activity.

[www.pvsites.eu](http://www.pvsites.eu)

TECNALIA, Spain

Belgium: FORMAT D2

France: NOBATEK INEF 4, CEA, Vilogia

Italy: R2M Solution Srl

Netherlands: BEAR

Portugal: CENTRO TECNOLOGICO DA CERAMICA E DO VIDRO

Spain: ONYX SOLAR, CRICURSA, ACCIONA CONSTRUCCION

Switzerland: FLISOM

United Kingdom: Film Optics Ltd



Energy efficiency



Maintenance & fault prediction



Comfort



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Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Sep. 2019**

Duration **42 months**

Status **In Progress**

Total budget **1,9 M€**

## QualDeEPC

High-quality energy performance assessment and certification in Europe accelerating deep energy renovation

QualDeEPC will work on EU-wide convergence of the building assessment and the issuance, design, and use of quality-enhanced EPCs as well as their recommendations for building renovation. The aim is to make these recommendations coherent with deep energy renovation towards a nearly-zero energy building stock by 2050.

[qualdeepc.eu](http://qualdeepc.eu)

Wuppertal Institute for Climate, Environment and Energy, Germany

Belgium: FEDARENE

Bulgaria: EAP

Germany: DENA

Germany: EPC

Greece: CRES

Hungary: ENERGIACLUB

Latvia: EKODOMA

Spain: ESCAN

Sweden: CIT





Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **June 2019**

Duration **36 months**

Status **Completed**

Total budget **1,5 M€**

# QUEST

## Quality Management Investments for Energy Efficiency

QUEST supports the uptake of investments in Sustainability and Energy Efficiency by identifying and empirically risk-grading factors that influence performance. QUEST has developed a simple toolkit to evaluate the financial added value of Quality Management Services to specific building projects. It may be easily applied to both renovation and new construction projects, covering project design-construction-operation risks.

[project-quest.eu](http://project-quest.eu)

synavision GmbH, Germany

**France:** COPILOT - Building Commissioning Certification

**Denmark:** Sweco

**Sweden:** KTH - Royal Institute of Technology in Stockholm

**Belgium:** REHVA, AMICE

**Italy:** Politecnico di Torino, Fondazione LINKS



QUEST

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2020**

Duration **36 months**

Status **In Progress**

Total budget **7,2 M€**

## ReDREAM

Real Consumer Engagement through a new user-centric Ecosystem Development for end-users' assets in a multi-market scenario

The REDREAM project will enable the effective participation of consumers and prosumers in the energy market. It will develop a strategy for the creation of a value generation chain based on a revolutionary service-dominant logic paradigm. The project will collect DR tools and energy/non-energy services to enable consumers to participate in the energy market. The results will assist in the generation of a new concept of connected ecosystem.

[redream-energy-network.eu](http://redream-energy-network.eu)

Universidad Pontificia Comillas, Spain

**Spain:** Universidad Pontificia Comillas, OMIE, Energetica S. Coop, Stemy Energy, Soulsight, OlivoEnergy

**Belgium:** Timelex

**Croatia:** Green Energy Cooperative

**France:** Université de Bourgogne Franche-Comté

**Germany:** European Science Communication Institute (ESCI)

**Greece:** The National Technical University (NTUA)

**Italy:** Rimond, CiviESCO, Bio-Distretto della Via Amerina e delle Forre

**UK:** Bath & West Community Energy



ReDREAM  
change your energy

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Jun. 2022**

Duration **48 months**

Status **In Progress**

Total budget **6 M€**

# Reincarnate

Reincarnation of construction products and materials by slowing down and extending cycles

Reincarnate aims at enabling the European construction industry to significantly reduce construction and demolition waste (CDW) by providing a circular potential assessment information model platform (CP-IM) and a set of innovations to make use of the CP-IM. The innovations will draw upon emerging digital technologies, such as digital twin representation, artificial intelligence, and robotic automation.

[www.reincarnate-project.eu](http://www.reincarnate-project.eu)

TECHNISCHE UNIVERSITÄT BERLIN, Germany

**Austria:** Austrian Standards International

**China:** HongKong Polytechnic University

**Germany:** Berlin Technical University, BAM, 3L

**Netherlands:** TU Delft, DEMO, Erasmus University Rotterdam

**Poland:** LAFARGE, MOSTOSTAL, PLGBC

**Serbia:** Mainflux Labs

**Spain:** AUSTRALO, VIAS

**Sweden:** Plan B, RAGN-SELLS



Energy efficiency



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Energy flexibility & storage



Website

Coordinator

Partners

Start date **Jan. 2015**

Duration **66 months**

Status **Completed**

Total budget **32,5 M€**

# REMOURBAN

## Regeneration Model for accelerating the Smart Urban Transformation

REMOURBAN has validated a holistic Urban Regeneration Model in 5 EU cities accelerating the clean energy transition via an urban transformation process that takes into account all aspects of sustainability: energy efficiency, sustainable mobility, ICT integration and engagement of all societal players.

[www.remourban.eu](http://www.remourban.eu)

CARTIF Technology Centre, Spain

**Belgium:** AREBS, youris.com

**Germany:** Steinbeis Europa Zentrum

**Hungary:** Miskolc Holding

**Italy:** Officinae VERDI

**Spain:** ACCIONA, Ayuntamiento de Valladolid, GMV, Iberdrola, VEOLIA, XERIDIA

**Turkey:** Tepebasi Municipality, DEMIR Enerji, Energon, Olcsan, Anadolu University

**United Kingdom:** Nottingham City Council, Nottingham Trent University, Nottingham Energy Partnership, Infohub, Sasie



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Sep. 2015**

Duration **36 months**

Status **Completed**

Total budget **6,8 M€**

# REnnovates

## Flexibility Activated Zero Energy Districts

REn(n)ovates demonstrated an innovative systemic deep renovation approach combining envelope renovation with pre-fabricated modules with an Energy Module 'container box' that integrates all HVAC equipment and communication technology. The inclusion of smart control strategies introduced at building and district level unlocked the residential energy flexibility for grid and system level services.

[www.rennovates.eu](http://www.rennovates.eu)

BAM, the Netherlands

Belgium: VITO, Enervalis, Belfius

Finland: Massive Cell Technologies

Germany: KEO

Poland: Mostostal

Spain: MONDRAGON

Netherlands: STEDIN



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2017**

Duration **52 months**

Status **Completed**

Total budget **8,7 M€**

## RenoZEB

### Accelerating Energy renovation solutions for Zero Energy Buildings and Neighbourhoods

RenoZEB aims to unlock the nZEB renovation market through a systemic approach to retrofitting. Key aspects include a holistic, cost efficient & fast deep renovation process supported by ICT tools & low-disturbance technological solutions. All phases of a renovation are covered (planning, design, construction & management) guided by 3 main drivers: cost reduction, time reduction & net primary energy use reduction.

[www.renozeb.eu](http://www.renozeb.eu)

SOLINTEL M&P SL, SPAIN – Project Coordinator: Michele Valallo

**Belgium:** CONSEIL DES ARCHITECTES D'EUROPE, FEDERATION EUROPEENNE DE LA PROPRIETE IMMOBILIERE

**Bulgaria:** BALKANIKA ENERGY AD

**Cyprus:** HIT HYPERTECH INNOVATIONS LTD

**Estonia:** KORTERIUHISTU RANNALIIVA, TARTU ENERGY

**France:** CSTB

**Germany:** BECK+HEUN GMBH, FRAUNHOFER ISE

**Italy:** FOCCHI SPA, RINA CONSULTING-D'APPOLONIA SPA, UNIVERSITA POLITECNICA DELLE MARCHE

**Spain:** CYPE SORT SL, TECNALIA, DURANGO ERAIKITZEN SA, SYMELEC

**United Kingdom:** THE UNIVERSITY OF SALFORD, ENERGYPRO



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Feb. 2016**

Duration **60 months**

Status **Completed**

Total budget **29,3 M€**

# REPLICATE

## REnaissance of Places with Innovative Citizenship and Technology

REPLICATE aimed to develop and validate a sustainable city business model in the lighthouse cities of San Sebastian, Florence and Bristol, to improve the transition process towards a SmartCity in the fields of energy efficiency, sustainable mobility and infrastructures, deploying innovative technologies, increasing the quality of life of the citizens, and influencing the replication process.

[replicate-project.eu](http://replicate-project.eu)

Fomento San Sebastián, Spain

**Germany:** Stadt Essen, Nec Laboratories Europe Gmbh, Technomar Gmbh

**Italy:** Comune Di Firenze, Consiglio Nazionale Delle Ricerche, E-Distribuzione Spa, Enel X Srl, Mathema Srl, Spes Consulting, Telecom Italia Spa, Thales Italia Spa Universita Degli Studi Di Firenze, Thales Italia Spa

**Spain:** Fomento De San Sebastian Sa, Ayuntamiento De Donostia San Sebastian, Compania Del Tranvia De San Sebastian Sa – Ctss (Dbus), Eurohelp Consulting Sl, Euskaltel Sa, Giroa Sa, Ikusi, Leycolan S.A.L. Sistelec S.L Fundacion Esade, Fundacion Tecnalia Research & Innovation, Zabala, Innovation Consulting, S.A

**Switzerland:** Administration Communale De La Ville De Lausanne Turkey:

Nilufer Belediye Baskanligi, De Surdurulebilir Enerji Ve Insaat Sanayi Ticaret Limited Sirketi (Demir)

**United Kingdom:** Bristol City Council, Bristolisopen Limited, Co-Wheels Car Club Community Interest Company, Esoterix System Ltd, Knowle West Media Centre Lbg, Nec Europe Ltd, Route Monkey Ltd, Toshiba Europe Limited, University of Bristol, Zeetta Networks The University Of Exeter, University Of The West Of England, Bristol, The Chancellor, Masters And Scholars Of The University Of Oxford (Limited)



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2017**

Duration **36 months**

Status **Completed**

Total budget **3,6 M€**

# RESPOND

## Integrated demand REsponse Solution towards energy P OSitive Neighbourhoods

RESPOND deploys and demonstrates an interoperable, cost effective and user-centred DR solution. It uses energy automation, control, and monitoring tools to integrate a cooperative DR program into legacy energy management systems. It follows an integrated approach to optimise energy dispatching in real time, considering both energy demand and supply while exploiting all available energy assets.

[project-respond.eu](http://project-respond.eu)

Fenie Energía, Spain

**Czech Republic:** ENERGOMONITOR S.R.O

**Denmark:** AALBORG UNIVERSITET, ALBOA - ALMEN BOLIGORGANISATION AARHUS, AURA A/S, DEVELCO PRODUCTS AS

**Ireland:** COMHARCHUMANN FUINNIMH OILEAIN ARANN TEORANTA, NATIONAL UNIVERSITY OF IRELAND GALWAY

**Serbia:** INSTITUT MIHAJLO PUPIN

**Spain:** DEXMA SENSORS SL, FENIE ENERGIA SA, FUNDACION TEKNIKER



**RESPOND**

DEMAND RESPONSE FOR ALL



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2019**

Duration **48 months**

Status **In Progress**

Total budget **18,9 M€**

# REWARDHeat

## Renewable and Waste Heat Recovery for Competitive District Heating and Cooling Networks

REWARDHeat will demonstrate a new generation of low-temperature district heating and cooling networks, which will be able to recover renewable and waste heat, available at low temperatures. REWARDHeat will promote punctual metering, thermal storage management, network smart control as a means to enable and optimise the exploitation of renewable and waste heat in DHC networks.

[www.rewardheat.eu](http://www.rewardheat.eu)

Eurac Research - Italy

**Belgium:** Euroheat & Power, European Heat Pump Association

**Croatia:** Ljeciliste Topusko, Sveuciliste U Zagrebu, Fakultet Strojtarstva I Brodogradnje

**Denmark:** Aalborg Universitet, Albertslund Kommune, Danfoss A/S

**France:** Artelys, Dalkia, Electricite De France, Energie Solidaire

**Germany:** Enisyst Gmbh, Energie Plus Concept Gmbh, Hawk Hochschule Fur Angewandte Wissenschaft Und Kunst Fachhochschule Hildesheim/Holzminen/Gottingen, Hochschule Fur Technik Stuttgart, Warme Hamburg Gmbh

**Italy:** A2a Calore & Servizi Srl, Rina Consulting

**Netherlands:** Mijnwater Energy Bv, Thermaflex International Holding Bv

**Poland:** Szczecinska Energetyka Ciepna Spolka Z Ograniczona Odpowiedzialnoscia

**Spain:** Fundacion Cartif, Hulleras Del Norte Sa, Sampol Ingenieria Y Obras S.A.

**Sweden:** Arvalla Ab, E.On Energilosnigar Aktiebolag, Indepro Ab, Ivl Svenska Miljoeinstitutet Ab



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Nov. 2016**

Duration **60 months**

Status **Completed**

Total budget **19,5 M€**

# RUGGEDISED

## Rotterdam, Umea and Glasgow: Generating Exemplar Districts In Sustainable Energy Deployment

The project creates urban spaces powered by affordable and clean energy. The overall aims are: 1. Improving the quality of life of the citizens, by offering the citizens a clean, safe, attractive, inclusive and affordable living environment. 2. Reducing the environmental impacts of activities, by achieving a significant reduction of CO2 emissions. 3. Creating a stimulating environment for sustainable economic development.

[www.ruggedised.eu](http://www.ruggedised.eu)

City of Rotterdam

**Australia:** Austrian Institute of Technology

**Czech Republic:** Municipality of Brno, University of Brno

**Germany:** ICLEI

**Italy:** ISINNOVA, Municipality of Parma, Infomobility

**Netherlands:** City of Rotterdam, Erasmus University, KPN, Uniresearch B.V, TNO, ENECO, Ballast Nedam, Uniresearch B.V., Future Insight, RET (ROTTERDAMSE ELEKTRISCHE TRAM)

**Poland:** City of Gdansk, PICTEC, Gdansk Water Utilities

**Sweden:** City of Umeå, RISE SWEDEN, Umeå university, Akademiska hus AB, Västerbotten County Council, Umeå energi AB, UPAB

**United Kingdom:** University of Strathclyde, Transport Scotland, Siemens, Glasgow City Council, SP Power Systems, Tennents Caledonian Brewery, The Wheatley Group



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2020**

Duration **48 months**

Status **In Progress**

Total budget **6,9 M€**

# SATO

## Self Assessment Towards Optimization of building energy

The SATO project implements a cloud-based platform to perform self-assessment and optimization of buildings' energy and energy-consuming devices. The SATO platform integrates a self-assessment framework and energy management services that combine building physics and artificial intelligence approaches. Web-based interfaces and 3D BIM-based visualization provide complementary visions of buildings and appliances' real-life energy performance.

[www.sato-project.eu](http://www.sato-project.eu)

FCiências.ID, Portugal

**Austria:** Siemens Austria

**Denmark:** Aalborg University, Xtel Wireless, Frederikshavn Boligforening  
**Greece:** CORE IC

**Italy:** Politecnico di Milano, Comune di Milano, Knauf Insulation

**Portugal:** FCiências.ID, Vieira & Lopes, EDP CNET, SONAE MC, Siemens Portugal, Agência Municipal da Energia do Seixal, Worten, Ciências, Smart Energy Lab, EDP Comercial

**Spain:** CYPE

**Switzerland:** EKAG



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Apr. 2016**

Duration **54 months**

Status **Completed**

Total budget **5,5 M€**

# Sim4Blocks

## Simulation Supported Real Time Energy Management in Building Blocks

Within Sim4Blocks, software optimization prototypes and interfaces for the flexibilized operation of heat pumps have been developed and tested at three pilot sites. It was shown that heat pumps represent a large flexibility potential and that it is possible to manage clusters of heat pumps to increase PV self-consumption, to apply flexible electricity prices and to serve the operating reserve.

[www.sim4blocks.eu](http://www.sim4blocks.eu)

HFT Stuttgart, Germany

**Austria:** Austrian Institute of Technology GmbH

**Belgium:** Centrica

**Germany:** Municipality of Wüstenrot, Schwäbisch Hall Municipal Utilities, enisyst GmbH, European Institute for Energy Research (EIFER)

**Ireland:** University College Dublin

**Spain:** Centre Internacional de metodes numeric en enginyeria (CIMNE), Energea Enginyeria en Eficiència Energètica SL, S.P.M. Promocions Municipals de Sant Cugat del Vallès S.A. Promusa.

**Switzerland:** Haute école spécialisée de Suisse occidentale, Elimes AG

**United Kingdom:** EDF Energy R&D UK Centre Limited, Insight Media Ltd.



Sim4Blocks

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Sep. 2021**

Duration **36 months**

Status **In Progress**

Total budget **4,7 M€**

# Smart2B

## Smartness to existing Buildings

Smart2B aims to create a smart building system, consisting of the Smart2B devices, platform and services, by enabling buildings to interact with their occupants and the grid to untap energy efficiency and flexibility. This approach will transform the buildings into an interconnected active element of the energy system by upgrading the smartness levels of existing buildings through coordinated control of legacy equipment and smart appliances.

[smart2b-project.eu](http://smart2b-project.eu)

EDP, Portugal

Austria: TUG

Belgium: VITO

Denmark: ABL

Germany: RWTH

Greece: CERTH

Italy: DI, EB

Portugal: EDP, FC.ID, SCML

Spain: OdinS



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Feb. 2016**

Duration **66 months**

Status **Completed**

Total budget **31,9 M€**

# SmartEnCity

## Towards smart zero CO2 cities across Europe

SmartEnCity developed a highly replicable systemic approach towards urban transformation into sustainable, smart environments. The concept is the Smart Zero Carbon City, where carbon footprint and energy demand are minimized by the use of demand control tech to save energy and promote awareness; energy supply is renewable; local energy resources are smartly managed by citizens, public and private stakeholders.

[smartencity.eu](http://smartencity.eu)

TECNALIA RESEARCH & INNOVATION, Spain

**Bulgaria:** Obshtini Asenovgrad, Sofia Energy Centre Ltd

**Denmark:** Project Zero A/S, Sonderborg Andelsboligforening, Boligforeningen Soebo, Planenergi Fond, Aalborg Universitet, Sonderborg Forsyningssservice As, Boligforeningen B42, Vikingegaarden As

**Estonia:** Tartu Ulikool, Smart City Lab, Institute Of Baltic Studies, As Fortum Tartu, Cityntel Ou, Tartu Linn, Mittetulundusuhing Tartu Regiooni Energiaagentuur, Takso Oü, Telia Eesti As

**Germany:** Steinbeis Innovation Gmbh

**Italy:** Citta Di Lecce\*Comune Di Lecce, Rina Consulting Spa

**Spain:** Vivienda Y Suelo De Euskadi S.A., Centro De Estudios Ambientales Cea, Mondragon Corporacion Cooperativa Scoop, Fagor Ederlan S.Coop., Agrupacion Cluster De Electrodomesticos De Euskadi (H Enea), Etic-Embedded Technologies Innovation Center S. Coop, Giroa Sociedad Anonima, Lks Infraestructuras It Sociedad Limitada, Fundacion Tecnalia Research & Innovation, Ayuntamiento De Vitoria-Gasteiz, Acciona Construccion Sa, Fundacion Cartif, Estudios Gis S.L., Ondoan S Coop Ltda , Ingenieria Especializada Obra Civil E Industrial Sa, Mcctelecom S Coop



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Jul. 2022**

Duration **36 months**

Status **In Progress**

Total budget **4,7 M€**

# SmartLivingEPC

## Advanced Energy Performance Assessment towards Smart Living in Building and District Level

SmartLivingEPC aims to deliver a certificate that will be issued with the use of digitized tools and retrieve the necessary assessment information for the building shell and systems from BIM literacy, including enriched energy and sustainability related information (designed and the actual performance). A special aspect of SmartLivingEPC is its application in building complexes, with the aim of energy certification at the neighbourhood scale.

[www.smartlivingepc.eu](http://www.smartlivingepc.eu)

CERTH, Greece

Austria: ASI

Belgium: REHVA, ANEC

Cyprus: FRC

Estonia: Taltech

Germany: EUNICE

Greece: CERTH, IsZEB, QUE

Ireland: IESRD, WSEE

Italy: R2M Solution, R2I

Netherlands: DEMO

Romania: AIIR

Spain: UDEUSTO, GOI



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2022**

Duration **36 months**

Status **In Progress**

Total budget **2 M€**

# SMART SQUARE

Smart Tools for Smart Buildings:  
Enhancing the intelligence of  
buildings in Europe

The project Smart Tools for Smart Buildings: Enhancing the intelligence of buildings in Europe (Smart<sup>2</sup>), aims to develop and deliver the appropriate tools and applications, which will enable the promotion and establishment of intelligence assessment of buildings in Europe, through buildings Smart Readiness Indicator (SRI) scheme.

[www.smartsquare-project.eu](http://www.smartsquare-project.eu)

CyRIC Ltd, Cyprus

Belgium: REHVA

Bulgaria: EnEffect

Cyprus: Euphyia Tech Ltd

Germany: Cleopa GmbH

Greece: IsZEB

Italy: Arcadis Italia Srl, R2M Solution Srl

Ireland: Brainbox AI

Romania: ASRO

**SMART<sup>2</sup>**  
ENHANCING THE INTELLIGENCE  
OF BUILDINGS IN EUROPE



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Sep. 2019**

Duration **36 months**

Status **In Progress**

Total budget **1,9 M€**

## SMI

Smart Meter Inclusif : Artificial intelligence to support the proactive management of energy consumption by end users

The project is part of a perspective linking artificial intelligence and micro-societal analysis.

The objective is to design a new intelligent tool that is more efficient, safe and better accepted by consumers. The users of this intelligent tool will be able to collect and predict the consumption of their electrical appliances. The project will evaluate new techniques to improve the security level.

[www.smi.uha.fr/en](http://www.smi.uha.fr/en)

Djaffar Ould Abdeslam, France

**France:** Université de Haute-Alsace, CNRS – Alsace delegation, Pôle Fibres-Energie, Mobasolar, OPAL-RT EUROPE

**Germany:** Hochschule Furtwangen, Hochschule Offenburg, University of Freiburg, Hochschule für öffentliche Verwaltung Kehl, Badenova, European Institute for Energy Research, Easy Smart Grid GmbH, Universität Koblenz-Landau

**Switzerland:** Fachhochschule Nordwestschweiz, Swiss Confederation, Canton of Basel-Stadt, Canton of Basel-Landschaft, Canton of Aargau, IWB



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Nov. 2018**

Duration **48 months**

Status **Completed**

Total budget **12,7 M€**

# SPHERE

## Service Platform to Hoste and SharE REsidential data

SPHERE IS A BIM DIGITAL TWIN ECOSYSTEM. SPHERE is a 4-year, Horizon 2020 project that aims to provide a BIM-based Digital Twin Ecosystem to optimise the building lifecycle, reduce costs, and improve energy efficiency in residential buildings. Achieved through the integration of several DT Platforms and IoT Platforms with different energy, sustainability, construction and O&M software tools based on a webAPI service, ontologies & semantics.

[sphere-project.eu](http://sphere-project.eu)

IDP, Spain

Austria: CREE

Finland: VTT, Caverion

France: OPY

Germany: MBCC, Ascora

Ireland: NUIG, VRM

Netherlands: TNO, Neanex

Spain: COMSA, COMET, EAI, Eurecat

United Kingdom: R2M Solution, Ekodenge



**SPHERE**  
BIM DIGITAL TWIN PLATFORM

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Dec. 2022**

Duration **30 months**

Status **In Progress**

Total budget **2,1 M€**

# SRI-ENACT

## Co-creating Tools and Services for Smart Readiness Indicator Uptake

SRI-ENACT provides a holistic solution to facilitate SRI uptake in EU, by engaging stakeholders in co-creation of national-tailored SRI implementations and the development of the SRI-ENACT toolkit, encompassing SRI assessment and decision support tools to promote informed decision making for smartness upgrades. The solution will be applied in 8 EU countries (AU, BG, CZ, EL, ES, HR, LV, RO) involving 120 SRI auditors for the assessment of 1200 buildings.

[webgate.ec.europa.eu/life/publicWebsite/project/details/101077201](http://webgate.ec.europa.eu/life/publicWebsite/project/details/101077201)

SingularLogic, Greece

**Austria:** OÖ Energiesparverband

**Belgium:** EUROHEAT & POWER

**Bulgaria:** Black Sea Energy Research Centre

**Czech Republic:** SEVEN

**Latvia:** RĪGAS PLĀNOŠANAS REĢIONĀ

**Greece:** SingularLogic, SenseOne, NTUA

**Romania:** ISPE

**Spain:** VEOLIA



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Nov. 2022**

Duration **36 months**

Status **In Progress**

Total budget **2 M€**

# SRI2MARKET

Paving the way for the adoption of the SRI into national regulation and market

The SRI2MARKET project will improve the knowledge and capabilities of six (6) Member States (Austria, Croatia, Cyprus, France, Portugal, and Spain) with regards to the introduction of the SRI (Smart Readiness Indicator) in their national regulation and market.

[webgate.ec.europa.eu/life/publicWebsite/project/details/101077280](http://webgate.ec.europa.eu/life/publicWebsite/project/details/101077280)

IEECP, The Netherlands

**Austria:** AEE, BOKU University

**Belgium:** REHVA

**Croatia:** Energy institute HRVOJE POŽAR

**Cyprus:** Cyprus Energy Agency

**France:** R2M Solution

**Greece:** University of Piraeus Research Centre, Hebes Intelligence

**Portugal:** ADENE

**Spain:** Fundacion CENER, EFINOVATIC

# SRI2MARKET

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2017**

Duration **41 months**

Status **In Progress**

Total budget **21 M€**

# STARDUST

## Holistic and integrated urban model for smart cities

STARDUST brings together 3 advanced European cities with associated follower cities to pave the way towards the transformation of the carbon supplied cities into Smart, highly efficient, intelligent and citizen oriented cities, developing urban green solutions and innovative business models, integrating buildings, mobility and efficient energy through ICT. It is then validating these solutions and enabling their roll out.

[stardustproject.eu](http://stardustproject.eu)

FUNDACION CENER, Spain

**Belgium:** Greenovate ! Europe

**Czechia:** Mesto Litomerice

**Finland:** Tampereen Kaupunki, Teknologian Tutkimuskeskus Vtt Oy, Tampereen Sähkölaitos Oy, Skanska Talonrakennus Oy, Emermix Oy, Aurinkotekno Oy

**Greece:** Dimos Kozanis

**Italy:** Comune Di Trento, Accademia Europea Di Bolzano, Fondazione Bruno Kessler, Fondazione Icons, Officinae Verdi Group Spa, Dolomiti Energia Holding Spa, Istituto Trentino Per L'edilizia Abitativa S.P.A., Dedagroup Public Services Srl, Distretto Tecnologico Trentino Scarl

**Romania:** Asociatia De Dezvoltare Intercomunitara Zona Metropolitana - Cluj

**Spain:** Ayuntamiento De Pamplona, Zabala Innovation Consulting, Comunidad Foral De Navarra - Gobierno De Navarra, Naturgy Energy Group Sa, Navarra De Suelo Y Vivienda Sa, Sociedad Iberica De Construcciones Electricas, Universidad Publica De Navarra, Mancomunidad De La Comarca De Pamplona, Beeplanet Factory Sl

**United Kingdom:** Derry City And Strabane District Council



**STARDUST**  
Enlightening  
european cities

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Aug. 2019**

Duration **42 months**

Status **In Progress**

Total budget **4,8 M€**

# StepUP

## Solutions and Technologies for deep Energy renovation Processes UPtake

Deep renovation is key to drastically reduce energy demand. Currently, despite the availability of technology to achieve energy reduction, deep renovation is considered to be a risky investment. StepUP will develop an iterative process for deep renovation for decarbonisation, with fast design to operation feedback loops to minimise the performance gap, reduce investment risk and maximise value.

[stepup-project.eu](http://stepup-project.eu)

Integrated Environmental Solutions Ltd. , United Kingdom

Belgium: Greenovate ! Europe

Belgium: ENERGINVEST

Denmark: SUNTHERM

Hungary: ABUD, BP18

Ireland: IES R&D

Italy: MANNI, UNISMART

Spain: ACR, EURECAT

United Kingdom: IES Ltd.



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Oct. 2018**

Duration **60 months**

Status **In Progress**

Total budget **11,6 M€**

# SunHorizon

## SunHorizon

The main objective of SunHorizon is to demonstrate up to TRL 7 innovative and reliable Heat Pump solutions (thermal compression, adsorption, reversible) that acting properly coupled and managed with advanced solar panels (PV, Hybrid, thermal) can provide heating and cooling to residential and tertiary buildings with lower emissions. A cloud-based monitoring platform will optimise algorithms and tools for predictive maintenance.

[sunhorizon-project.eu](http://sunhorizon-project.eu)

RINA consulting s.p.a., Italy

Belgium: EHPA

France: DS, CEA, BH

Germany: FAHR, RATIO

Ireland: IES

Italy: RINA-C, ITAE, SE

Latvia: RTU

Romania: TUCN (Technical University of Cluj-Napoca)

Spain: VEO, EMVS, AJSCV, CARTIF

Sweden: CW, IVL

Switzerland: TVP

The Netherlands: BDR



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Jun. 2020**

Duration **60 months**

Status **In Progress**

Total budget **3 M€**

# SUPERHERO

SUstainability and PERformances for HEROTILE-based energy efficient roofs

SUPERHERO promotes the use of Ventilated and Permeable Roofs for an effective and low-cost answer to cities and buildings overheating. Here “passive cooling” technologies allow the reduction of the temperatures of buildings envelope (roofs and walls) and consequently of the surrounding air, thus limiting Urban Heat Island, decreasing the energy demands for artificial cooling and improving the indoor comfort.

[www.lifesuperhero.eu](http://www.lifesuperhero.eu)

CENTRO CERAMICO, Italy

France: CTMNC, EDILIANS

Italy: ACER, COMREGGIO, CONF CERAMICA, ICOTTOPOSSAGNO, TERREAL, UNIVPM

Spain: HYSPALIT





Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Jan. 2020**

Duration **54 months**

Status **In Progress**

Total budget **7,4 M€**

# syn.ikia

## Sustainable Plus Energy Neighbourhoods

The syn.ikia innovation project within the EU Horizon 2020 framework aims at enabling the development of sustainable plus-energy neighbourhoods in different climates, contexts and markets in Europe.

Four real-life plus-energy demo neighbourhoods tailored to four different climatic zones will be developed, analysed, optimized and monitored within the duration of the project.

[www.synikia.eu](http://www.synikia.eu)

NTNU, Norway

Belgium: BPIE, Housing Europe

Denmark: DTU, ENFOR

Hungary: ABUD

Netherlands: TNO, AREA

Norway: NTNU, SINTEF, OBOS

Spain: IREC, INCASOL



Sustainable  
plus energy  
neighbourhoods

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Nov. 2017**

Duration **42 months**

Status **Completed**

Total budget **3,8 M€**

# TABEDE

## TowArds Building rEady for Demand rEsponse

TABEDE enables all building types to integrate demand response schemes through a low cost extender for BMS systems or as a standalone system. Independent of communication standards, it integrates energy flexibility control algorithms so building managers can lower energy cost without affecting occupant comfort and energy providers can maximize the usage of renewable energy and ensure power quality.

[tabede.eu](http://tabede.eu)

Tractebel (Engie Impact), Belgium

**France:** SCHNEIDER ELECTRIC INDUSTRIES SAS, CEA

**Italy:** R2M Solution Srl, SCHNEIDER ELECTRIC SPA

**Switzerland:** CSEM CENTRE SUISSE D'ELECTRONIQUE ET DE MICROTECHNIQUE SA - RECHERCHE ET DEVELOPPEMENT

**United Kingdom:** CARDIFF UNIVERSITY



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Jul. 2021**

Duration **36 months**

Status **In Progress**

Total budget **1,9 M€**

# TIMEPAC

Towards innovative methods for energy performance assessment and certification of buildings

TIMEPAC project will improve the current energy performance certification by transitioning from a single, static certification to one that is more holistic and dynamic. TIMEPAC will combine EPC databases with other data sources to make certification more reliable. The methods and tools to enhance the current EPC schema will be tested in Austria, Croatia, Cyprus, Italy, Slovenia, and Spain. The findings will be used to develop training resources.

[timepac.eu](http://timepac.eu)

FUNITEC, Spain

Austria: SERA

Croatia: EIHP

Cyprus: OEB

Italy: EDIC, POLITO, RP

Slovenia: JSI, Mzi, GOLEA

Spain: CYPE, FUNITEC, ICAEN

# TIMEPAC

The new EPC for Europe

Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Mar. 2019**

Duration **48 months**

Status **Completed**

Total budget **5 M€**

## TRI-HP

Trigeneration systems based on heat pumps with natural refrigerants and multiple renewable sources

TRI-HP has developed affordable and efficient trigeneration systems that provide heating, cooling and electricity. The systems are based on heat pumps with natural refrigerants coupled with a high share of renewables and intermediate storage. The energy flows are managed through an advanced energy management control that uses real-time optimisation and results into energy savings up to 20%.

[tri-hp.eu](http://tri-hp.eu)

SPF-OST, Switzerland

Belgium: REHVA

Denmark: DTI

Germany: ISOE, Karlsruhe University of Applied Sciences

Norway: NTNU

Spain: Tecnalia, IREC

Sweden: Alfa Laval

Switzerland: SPF-OST, HEIM, ILAG



Energy efficiency



Maintenance & fault prediction



Comfort



Convenience



Health, well-being & accessibility



Information to occupants



Energy flexibility & storage



Website

Coordinator

Partners

Start date **Sep. 2019**

Duration **36 months**

Status **In Progress**

Total budget **2 M€**

## U-CERT

Towards a new generation of user-centred Energy Performance Assessment and Certification; facilitated and empowered by the EPB Center

U-CERT introduces a user-centred Energy Performance Assessment and Certification Scheme to value buildings in a holistic and cost-effective manner. The focus is on strengthening actual implementation of the EPBD by providing and applying insights from a user perspective and creating a level playing field for sharing implementation experience to all involved stakeholders, facilitated and empowered by the EPB Center.

[u-certproject.eu](http://u-certproject.eu)

Huygen Installatie Adviseurs, Netherlands

Belgium: REHVA

Bulgaria: EnEffect

Denmark: DTU

Estonia: Tal Tech

France: Tipee

Hungary: Comfort Consulting

Italy: AiCARR

Netherlands: Huygen, EPB Center, ISSO, TNO

Romania: AIIR

Slovenia: IRI UL

Spain: IVE, Atecyr

Sweden: KTH



## U-CERT

User-Centred Energy Performance Assessment and Certification

# About SmartBuilt4EU

SmartBuilt4EU (SB4EU) is an EC-funded project that aims to support the innovation ecosystem in the smart building value chain through concrete networking and communication actions:

- Reference and promote the key innovators and innovations in the sector
- Propose collaborative work to identify barriers, opportunities and best practices for the take up of smart buildings
- Consolidate these findings into a Strategic Research & Innovation Agenda that will feed the design of future Horizon Europe calls on smart buildings
- Provide recommendations to policy makers
- Develop tools to support the deployment of the Smart Readiness Indicator, a common scheme for rating the smart readiness of buildings



@SmartBuilt4EU



smartbuilt4eu.eu



contact@smartbuilt4eu.eu

Join the SB4EU Community  
and benefit from several  
advantages:

**INCREASE  
THE VISIBILITY  
OF YOUR  
INNOVATION  
OR  
R&D PROJECT**

**CONTRIBUTE  
DEFINING THE  
FUTURE  
EC-FUNDING  
CALLS ON SMART  
BUILDINGS**

**NETWORK  
WITH  
STAKEHOLDERS  
FROM  
ALL OVER  
EUROPE**

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# Project partners

The project is coordinated by ECTP, the European Construction, built environment and energy efficient building Technology Platform. It brings together five partners and five linked third parties throughout Europe.





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**Disclaimer:** the information presented in the brochure is accurate only at the time of publication. Please refer to the European Commission CORDIS database and/or to the website of each project for more updated information.

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