



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



March 2021

Smart Buildings EU-funded Innovations



Foreword

by the European Commission

European 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.

Pierre-Antoine Vernon, Project Advisor

European Commission

Executive Agency for Small and Medium-sized Enterprises (EASME)

Foreword

by the SmartBuilt4EU Partners

The SmartBuilt4EU project Partners are pleased to introduce the first 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 will indeed coordinate 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 46 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 brochure will be updated in 2022 and 2023, so as to include a wider set of newly identified projects.

The SmartBuilt4EU Partners

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" 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**. " ¹

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: technological

- 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 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

- ¹ 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

Energy savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

Coordinator

Partners

Start date **Oct. 2016**

Duration **57 months**

Status **In Progress**

Total budget **4,6 M€**

4RinEU

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

4RinEU provides new tools and strategies to encourage large scale 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

EURAC, Italy

Germany: Gump & 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 Construcción Sa, Agencia De L'habitatge De Catalunya

United Kingdom: IES - Integrated Environmental Solutions Limited



4RinEU

Energy savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

Coordinator

Partners

Start date **Nov. 2017**

Duration **42 months**

Status **In Progress**

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

European Dynamics Belgium SA.

Austria: VerbundSolutions4Customers

Denmark: GECO Global

France: Compte CO2

Greece: National Technical University of Athens, Kafkas

Spain: Eurofunding



Energy savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

www.bim4eeb-project.eu

Coordinator

Bruno Daniotti, Italy

Partners

Belgium: Architects' Council of Europe (ACE)

Cyprus: Suite5 Data Intelligence Solutions Limited

Germany: Technische Universität

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

Poland: Busto Arsizio and Prochem

Spain: Solintel M&P

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

Start date **Jun. 2019**

Duration **36 months**

Status **In Progress**

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.



BIM4EEB

BIM based fast toolkit for
Efficient rEnovation in Buildings

Energy savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

Coordinator

Partners

Start date **Sep. 2019**

Duration **18 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

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, Università Degli Studi Di Siena

Norway: Norsk Treteknisk Institutt Forening, Splitkon

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

Spain: Bimetica Parametric Design Services

Sweden: C.F. Moller Sverige Ab

United Kingdom: Waugh Thistleton Architects Limited



Energy savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

cordis.europa.eu/project/id/957026

Coordinator

Eurac Research, Italy

Partners

Austria: TU Wien

Belgium: BPIE

Germany: ICLEI-EU

Greece: Sympraxis

Spain: CARTIF, Everis

Sweden: Research Institutes of Sweden (RISE)

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.

Energy savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

www.charged-project.eu

Coordinator

European Dynamics Belgium SA.

Partners

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

Start date **Mar. 2016**

Duration **36 months**

Status **Finished**

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.



Energy savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

www.chess-setup.net

Coordinator

Urban Ecology Agency of Barcelona, Spain

Partners

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

Start date **Jun. 2016**

Duration **40 months**

Status **Finished**

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.



CHES
SET UP

Energy savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

www.domos-project.eu

Coordinator

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

Partners

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

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.



domOS

Energy savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

Coordinator

Partners

Start date **Mar. 2016**

Duration **42 months**

Status **Finished**

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

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 savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

Coordinator

Partners

Start date **Sep. 2018**

Duration **48 months**

Status **In Progress**

Total budget **4,6 M€**

DRIMPAC

Unified DR interoperability
framework enabling market
participation of active energy
consumers

DRIMPAC aims to provide 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

CERTH, Greece

Austria: E7

Cyprus: UCY

France: Sorea

Germany: KIT, SWT

Greece: Hypertech

Italy: JRC, STAM SRL

Romania: Siemens SLR

Spain: MyEnergia



Energy savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

Coordinator

Partners

Start date **Jan. 2015**

Duration **42 months**

Status **Finished**

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

NOBATEK/INEF4, France

Belgium: European Aluminium

Czech Republic: FENIX TNT

Greece: Aristotelio University of Thessalonikis, ELVAL COLOR

Italia: RINA

Spain: ACCIONA, CARTIF



Energy savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid 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 demonstrate smart-grid solutions (smart storage, V2G systems, SiC power inverters, power to heat, control of CHP, IoT-based building management and scalable energy management platform) to upgrade buildings. It has also developed distributed energy resources and electric grids for the integration in future flexibility markets and increasing the distribution grid reliability and resilience.

www.ebalanceplus.eu

CEMOSA, Spain

Denmark: DTU, ENFOR AS

France: Junia

Germany: IHP, ESCI, EMTECH

Italy: University of Calabria

Poland: NIPi

Portugal: MAGNUMCAP

Spain: Ampere, UMA, SOFTCRITS

Turkey: REENGEN

United Kingdom: TPS



ebalanceplus

Energy savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

Coordinator

Partners

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

CSTB, France

Belgium: REHVA

France: Bimeo, CSTB, EDF, ENGIE

Germany: Fraunhofer

Italy: Politecnico Milano, R2M Solution Srl

Luxembourg: LIST

Slovakia: ENBEE

Spain: Tecnalia

Start date **Sep. 2020**

Duration **40 months**

Status **In Progress**

Total budget **2,8 M€**

EPC RECAST
ENERGY PERFORMANCE
CERTIFICATE RECAST

Energy savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

www.eteacher-project.eu

Coordinator

CEMOSA, Spain

Partners

Belgium: REHVA

Finland: Granlund Oy

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

Italy: Fondazione Icons

Romania: ICPE SA

Spain: CEMOSA, IFM Software GMBH, ASCORA GMBH, Agencia Extremeña
de la Energia, Laura Otero Insatallaciones

United Kingdom: De Monfort University, Nottingham City Council

Start date **Oct. 2017**

Duration **45 months**

Status **In Progress**

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.



Energy savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid 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

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 savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid 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

CIRCE, Spain

Austria: EI-JHU

Belgium: UBE

Croatia: KONCAR KET, KRK

Cyprus: S5

France: VOLT

Greece: UBITECH, VERD, IOSA

Italy: RINA-C

Spain: CARTIF, LCTE



Energy savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

Coordinator

Partners

Start date **Oct. 2017**

Duration **54 months**

Status **In Progress**

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

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 savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

Coordinator

Partners

Start date **Oct. 2016**

Duration **56 months**

Status **In Progress**

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

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 savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

Coordinator

Partners

Start date **Sep. 2015**

Duration **48 months**

Status **Finished**

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.

www.hit2gap.eu 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 savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

Coordinator

Partners

Start date **Oct. 2017**

Duration **42 months**

Status **In Progress**

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

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 savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

Coordinator

Partners

Start date **Dec. 2018**

Duration **27 months**

Status **In Progress**

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 addresses 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

TECNALIA, Spain

Belgium: Eurocarers, ECTP, AGE Platform Europe

France: Certivea, R2M Solution

Italy: Università Politecnica Delle Marche

Netherlands: TNO, Universiteit Utrecht



Energy savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

www.interconnectproject.eu

Coordinator

INESC TEC, Portugal

Partners

Austria: cyberGRID

Belgium: VITO, Think E, ThermoVault, Vrije Universiteit Brussel, IMEC, DuCoop, 3E, CORDIUM CVBA, RDGfi, 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

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.

interconnect

Energy savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

Coordinator

Partners

Start date **Nov. 2016**

Duration **48 months**

Status **Finished**

Total budget **3,7 M€**

LowUP

LOW valued energy sources
UPgrading for buildings and
industry uses

The project develops and demonstrates 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 fuelled by low valued energy sources. These include both renewable and wasted energy sources.

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 savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid 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

ENGINEERING - INGEGNERIA INFORMATICA, Italy

Belgium: Comite Européen De Coordination De L'habitat Social Aisbl

Czech Republic: Seven, The Energy Efficiency Center Z.U.

Germany: Rheinisch-Westfaelische Technische Hochschule Aachen, Iclei European Secretariat GmbH (Iclei Europasekretariat GmbH)

Greece: National Technical University Of Athens – Ntua, Holistic Ike

Italy: Accademia Europea Di Bolzano, Asm Terni Spa

Latvia: Vides Investiciju Fonds Sia

Poland: Przedsiębiorstwo Robot Elewacyjnychfasada Sp Zoo, Miasto Gdynia

Portugal: Coopernico - Cooperativa De Desenvolvimento Sustentavel Crl

Slovenia: Blagovno Trgovinski Center Dd, Comensus - Komunikacije In Senzorika

Spain: Fundacion Cartif, Veolia Servicios Lecam Sociedad Anonima Unipersonal, Ente Publico Regional De La Energia De Castilla Y Leon



MATRYCS

Energy savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

www.merlon-project.eu

Coordinator

Hypertech, Greece

Partners

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 - Olokriromenes 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

Start date **Jan. 2019**

Duration **36 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.



Energy savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

Coordinator

Partners

Start date **Dec. 2014**

Duration **54 months**

Status **Finished**

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

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 savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

Coordinator

Partners

Start date **Sep. 2016**

Duration **54 months**

Status **In Progress**

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

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 Technologie SP Z.O.O., Fasada, Mostostal Warszawa S.A., Miasto Stoleczne Warszawa

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



Energy savings
on site



Maintenance &
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Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

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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

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 savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
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Information
to occupants



Grid 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

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 savings
on site



Maintenance &
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Information
to occupants



Grid 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

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 Ucení Technické V Praze, Recuair S.R.O., Rd Rymarov SRO Luxembourg: Intrasoft International SA

Poland: Bergamo Technologie SPZOO

Spain: Institut De Tecnologia De La Construcció De Catalunya, Pich-Aguilera Arquitectos SL, Fundació Institut De Recerca De L'energia De Catalunya, Agència De L'habitatge De Catalunya, Denvelops Textiles SL

Switzerland: HSR Hochschule Für Technik Rapperswil



Energy savings
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Grid flexibility
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Website

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Partners

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

TECNALIA, Spain

Belgium: FORMAT D2

France: NOBATEK INEF 4, CEA, Vilogia

Italy: R2M Solution Srl

Netherlands: BEAR

Portugal: CENTRO TECNOLÓGICO DA CERÁMICA E DO VIDRO

Spain: ONYX SOLAR, CRICURSA, ACCIONA CONSTRUCCION

Switzerland: FLISOM

United Kingdom: Film Optics Ltd

Start date **Jan. 2016**

Duration **54 months**

Status **Finished**

Total budget **8,5 M€**



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on site



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Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

Coordinator

Partners

Start date **Jan. 2015**

Duration **66 months**

Status **Finished**

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

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 savings
on site



Maintenance &
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Comfort



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Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

Coordinator

Partners

Start date **Sep. 2015**

Duration **36 months**

Status **Finished**

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

BAM, the Netherlands

Belgium: VITO, Enervalis, Belfius

Finland: Massive Cell Technologies

Germany: KEO

Poland: Mostostal

Spain: MONDRAGON

Netherlands: STEDIN



Energy savings
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Website

Coordinator

Partners

Start date **Oct. 2017**

Duration **48 months**

Status **In Progress**

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

SOLINTEL M&P SL, SPAIN

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



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Grid flexibility
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Website

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Partners

Start date **Feb. 2016**

Duration **60 months**

Status **Finished**

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

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 Università 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)



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Website

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Start date **Oct. 2017**

Duration **36 months**

Status **Finished**

Total budget **3,6 M€**

RESPOND

Integrated demand REsponse Solution towards energy POSitive 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

Feníe 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



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wellbeing



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Grid flexibility
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Website

Coordinator

Partners

Start date **Nov. 2016**

Duration **60 months**

Status **In Progress**

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

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



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wellbeing



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Grid flexibility
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Website

www.sim4blocks.eu

Coordinator

HFT Stuttgart, Germany

Partners

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), Energiea 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.

Start date **Apr. 2016**

Duration **54 months**

Status **Finished**

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.



Sim4Blocks

Energy savings
on site



Maintenance &
fault prediction



Comfort



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wellbeing



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to occupants



Grid flexibility
& storage



Website

Coordinator

Partners

Start date **Feb. 2016**

Duration **66 months**

Status **In Progress**

Total budget **31,9 M€**

SmartEnCity

Towards smart zero CO2 cities across Europe

SmartEnCity aims to develop 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

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 Forsyningservice As, Boligforeningen B42, Vikingegaarden As

Estonia: Tartu Ulikool, Smart City Lab, Institute Of Baltic Studies, As Fortum Tartu, Cityntel Ou, Tartu Linn, Mittetulundusühing 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 Construcción Sa, Fundacion Cartif, Estudios Gis S.L., Ondoan S Coop Ltda, Ingenieria Especializada Obra Civil E Industrial Sa, Mcctelecom S Coop



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Grid flexibility
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Website

Coordinator

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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

Djaffar Ould Abdeslam, France

France: Université de Haute-Alsace, CNRS – Alsace delegation, Pôle Fibres-Energivie, 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 savings
on site



Maintenance &
fault prediction



Comfort



Convenience



Health &
wellbeing



Information
to occupants



Grid flexibility
& storage



Website

Coordinator

Partners

Start date **Nov. 2018**

Duration **48 months**

Status **In Progress**

Total budget **12,7 M€**

SPHERE

Service Platform to Host and
Share Residential data

SPHERE IS A BIM DIGITAL TWIN PLATFORM. SPHERE is a 4-year, Horizon 2020 project that aims to provide a BIM-based Digital Twin Platform to optimise the building lifecycle, reduce costs, and improve energy efficiency in residential buildings.

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

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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

FUNDACION CENER, Spain

Belgium: Greenovate ! Europe

Czechia: Mesto Litomerice

Finland: Tampereen Kaupunki, Teknologian Tutkimuskeskus Vtt Oy, Tampereen Sahkolaitos Oy, Skanska Talonrakennus Oy, Enermix 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

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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

CENTRO CERAMICO, Italy

France: CTMNC, EDILIANS

Italy: ACER, COMREGGIO, CONFCERAMICA, ICOTTOPOSSAGNO, TERREAL, UNIVPM

Spain: HYSPALIT



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Convenience



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Information
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Grid flexibility
& storage



Website

www.synikia.eu

Coordinator

NTNU, Norway

Partners

Belgium: BPIE, Housing Europe

Denmark: DTU, ENFOR

Hungary: ABUD

Netherlands: TNO, AREA

Norway: NTNU, SINTEF, OBOS

Spain: IREC, INCASOL

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.



Sustainable
plus energy
neighbourhoods

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Website

Coordinator

Partners

Start date **Nov. 2017**

Duration **42 months**

Status **In Progress**

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

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



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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

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



@SmartBuilt4EU



smartbuilt4eu.eu



contact@smartbuilt4eu.eu

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

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

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.





For more information about SmartBuilt4EU

Website : smartbuilt4eu.eu

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Publication: March 2021

Editor: R2M Solution

Design: ODBO™
