PRELUDE

Prescient building Operation utilizing Real Time data for Energy Dynamic Optimization



“Smart solution for sustainable building”

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under Grant Agreement N° 958345. Call identifier: LC-EEB-07-2020

About

The PRELUDE project represents the improvement of the buildings smartness through minimization of energy utilization, maximization of self-consumption and Renewable Energy Sources investment and personalization, reduction of CO_2 footprint and improvement of comfortable and healthy indoor conditions. This will be possible through the combination of innovative, smart, low-cost solutions and proactive optimization service.

For more information you can visit this website: www.prelude-project.eu

This is the first release of the PRELUDE Project newsletter. There will be an overview of the main features and innovation elements of PRELUDE project and a presentation of the consortium.

Project overview

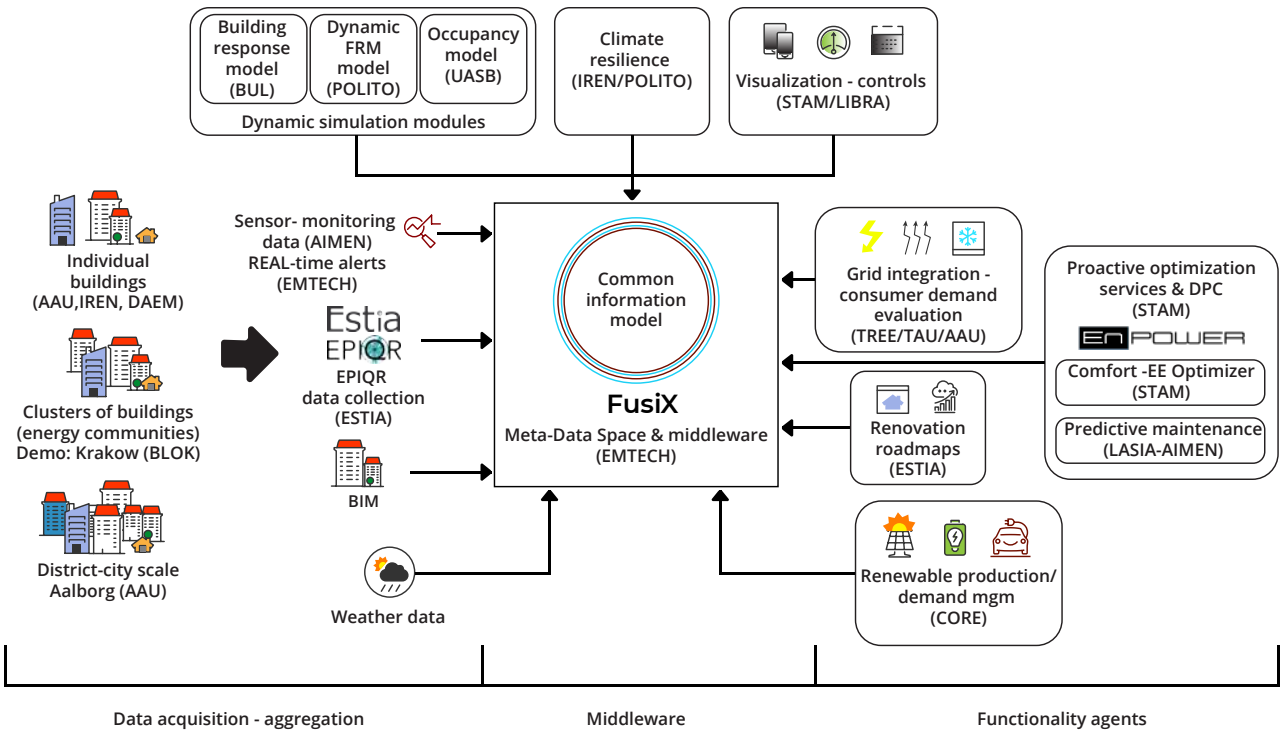
The wellbeing of European citizens is closely related to the **indoor conditions.** Comfortable and healthy living conditions for all citizens are a crucial part of the modern European society but difficult to attain due to the variability of typology and as well as the age and overall condition of the building stock.
It is a pressing need to improve indoor conditions in an **energy efficient** and **sustainable** way due to the well documented effects of climate change, that have already been experienced globally.
PRELUDE will facilitate the **transition to clean energy** by combining innovative, smart, low-cost solutions into a proactive optimization service. The project is focused on assessing the **right level of smartness** necessary for any given household and then providing the optimal tools according to the needs of the user. It is designed to be versatile and adapt to the engagement, monitoring and automation level of the building.



Passive solutions, such as natural ventilation and cooling, will be prioritized through a free running strategy. Predictive maintenance will be implemented to reduce costs, emphasizing RES (Renewable Energy Sources). Big data and advanced analytic tools will be used to facilitate flexible building side demand and ease the integration into district heating and electricity grids. Proactive optimization will be achieved through data predictive control.

The system is comprised of three main components:

1 - Firstly, the **data acquisition layer,** where information is being collected and aggregated;
2 - Secondly, the **middleware**, a modular multi-simulation, meta-dataspace hosting the datasets and models;
3 - Finally, the **proactive functionality agents**, featuring the optimization systems and controls.







The overall **ambition** of PRELUDE can be expressed in three levels: for the **European citizen**, PRELUDE will be poised to deliver quality of life, wellbeing, comfort, cost-savings or even revenue, education and sustainability regardless of their financial means. For **building owners, managers, utility and other building or energy related service providers,** PRELUDE will solve issues and address challenges inhibiting investment in Renewable Energy sources and Variable Renewable Energy sources, increasing the value of their properties and creating new ways to build rapport with their customers. For regional organizations, municipalities, associations and the **European society** as a whole, PRELUDE will contribute to improving the prosperity, achieving energy security and the realisation of climate and energy goals.

Welcome to PRELUDE partners

1A Ingenieros S.L.P

1A Ingenieros is a leading company in the construction engineering sector. Expanding its operational capacity into numerous engineering fields, 1A Ingenieros achieved its current position as one of the most prestigious engineering firms nationwide and it has been able to generate a culture of anticipation and adaptation to change, oriented to the market. The 1A team is composed of more than one hundred qualified experts committed to creating sustainable value and fostering continuous improvement in each project and in the society as a whole.

Contact info:
www.1aingenieros.com

Strenghts:
engineering, expertice, improvement

Aalborg University

Aalborg University is the fifth Danish university with more than 20,000 students registered and more than 2500 scientific staff-year. The Architectural Engineering division at the Department of the Built Environment has for many years developed and improved tools for building energy and indoor climate assessment. Over the last years it has been involved in research projects and teaching activities related to deep energy renovations, development of different new technologies aiming renovation market and energy conservation and several demonstration cases focused on energy and indoor climate assessments and building commissioning.

Contact info:
www.en.aau.dk

Strenghts:
architectural engineering, energy, modelling

AIMEN Technology Centre

AIMEN is a Non-Profit association, located in the Northwest of Spain and constituted by about 80 companies, which supplies technological support to more than 500 companies dedicated to industrial activity related to metallurgy, automotive sector, shipbuilding, etc. It is highly specialized in materials and in advanced manufacturing technologies, especially joining technologies and laser technologies applied to materials processing, robotics and automation. With more than 250 employees its mission is to improve competitiveness and technology know-how of Manufacturing Industry.

Contact info:
www.aimen.es

Strenghts:
manufacturing industry, technology, competitiveness

BLOK Architekci

BLOK Architekci is a Polish architectural studio focused on sustainability in architecture & building sector via BIM & LBC. It designs an affordable and modern architecture, inspired by Scandinavian style characterized by simplicity, functionality, and care for the natural environment and human well-being. It is one of the first studio in Poland designing in BIM & raising awareness among the developers about the BIM technology for design and built: BIM technology helps in the planning, visualising and managing of buildings and due to that they are more energy efficient, useless water and provide better air quality.

Contact info:
www.blokarchitekci.pl

Strenghts:
architectural studio, sustainability, BIM

Brunel University London

Brunel University London is a public research university located in the Uxbridge area of London, England. It has over 15,000 students and over 2,000 academic staff operating in a vibrant culture of research excellence. Brunel's Institute of Energy Futures brings together researchers from a range of disciplines to investigate and develop innovative energy efficient technologies and processes to address societal needs and greenhouse gas emissions targets whilst taking into consideration the influence of human behaviour.

Contact info:
www.brunel.ac.uk

Strenghts:
research excellence, international, energy

Core Innovation and Technology

Core Innovation and Technology OE (CORE) is a start-up company offering tailor-made solutions to attach meaning to data in several industrial sectors and use cases using Artificial Intelligence technologies. CORE uses its own innovation management approach to analyze customer needs and form new concepts (Concept and Business Model Engineering). CORE activities are focused on predictive analytics, simulation and optimization algorithms, innovation management, H2020 funding and mentoring, facilitating and co-designing use cases, testing pilots and field trials.

Contact info:
www.core-innovation.com

Strenghts:
Artificial Intelligence, innovation management, business approach

CPEG Geneva Pension Fund

CPEG is a public pension fund that manages a real estate portfolio, the largest in the Canton (State) of Geneva, which has about 10,000 housing units and several hundreds of buildings, including residential and administrative buildings. They are a public law company, with an ethic focused on the use of renewable sources, respect for the environment and experimentation with solutions in an economically sustainable manner.

Contact info:
www.cpeg.ch

Strenghts:
renewable energy, sustainability, innovation

DAEM DIMOS ATHINAION EPICHEIRI-SI MICHANOGRAFISIS

DAEM SA is the IT company of the City of Athens, the oldest and most significant Local Government IT Company operating since 1983. Its aim is to develop and promote innovative services for the Smart and Sustainable City idea that is as well a strategic objective at the city level. DAEM's main business field is the development of e-Governance systems and services supporting local government organizations, public administration and other authorities.

Contact info:
www.daem.gr

Strenghts:
sustainable city, eGovernance, smartness



EMTECH Diastikimiki Monoprosopi IKE

EMTECH DIASTIKIMI MONOPROSPI IKE (EMTECH SPACE P.C.) is a Greek SME and technology (hardware and software) provider for space and energy systems operation. EMTECH in PRELUDE will use its data fusion engine to facilitate homogenous data streamlining from platform's data sources to end-user interfaces and contribute to project's testing, integration and scalability requirements.

Contact info:
www.emtech.global

Strenghts:
simulations, software, energy operation

Estia

Estia SA

Estia is a spin-off company of the Solar Energy and Building Physics. The team consists of highly qualified engineers and architects, boasting a wide experience. Its mission is to promote innovation and, particularly, the implementation of principles of sustainable development in the built environment. Estia provides consulting services independently, favouring a global approach of the building physics.

Contact info:
www.estia.ch

Strenghts:
innovation, competence, technical expertise

EUROCORE CONSULTING

EUROCORE Consulting is a young and fast-growing company providing technical support and consultancy to organizations of both private and public sector, across all areas of its expertise, with focus on the fields of occupational health & safety and environment. EUROCORE expertise extends to other areas of science and engineering, providing specialized support. These other areas comprise Energy Efficiency and Renewable Energy Sources, Environmental Impact and Protection, Sustainable Management of Resources, coupled with the relevant investing, business-doing and development consulting aspects.

Contact info:
https://eurocore.be/

Strenghts:
knowledge, consultancy, multidisciplinary

Forschung Burgenland GmbH

Forschung Burgenland GmbH is the research subsidiary of the University of Applied Sciences Burgenland and Forschung Burgenland. It is solely dedicated to R&D-projects; the Center for Building Technology and the Center for Health and Work Research are their first core research centers. In addition to that they work on heat pump research, smart city developments, social work topics, social science methodology competence, intercultural management, communications, health care management, cloud and cyberphysical security and consumer insights.

Contact info:
www.forschung-burgenland.at/

Strenghts:
problem solving, research, R&D

INNOVACION Y CONSULTING TECNOLOGICO SL INCOTEC

INCOTEC is an independent initiative with more than 20 years' experience in business innovation. Since the set-up of the company in 2000, with the automotive sector as the main target, INCOTEC's activity has expanded to other areas making it one of the leading Spanish consultancy firms in the, Construction, Agri-Food, Chemical, Ceramic, Automotive and Health sectors, among others. INCOTEC supports companies to structure their innovation in order to improve their competitiveness and market positioning.

Contact info:
www.incotec.es

Strenghts:
business, strategies, innovation

Iren SpA

Iren Smart Solutions is the Energy Service Company of Iren Group, it operates in the energy efficiency sector and in the design, construction, installation and full service management of technological systems. Its clients are mainly represented by condominiums, industry, tertiary sector, public administration and non-profit organisations, to which it provides services that generate tangible and lasting economic savings. Iren Smart Solutions offers a wide range of products for energy efficiency: cogeneration, LED relamping, thermal systems, photovoltaics, global service, thermal insulations and much more.

Contact info:
www.gruppoiren.it

Strenghts:
energy efficiency, saving, competence

La Sia SRL

LA SIA is a company, founded in 2004 and headquartered in Rome, that dedicated to providing all-round design services, from structural design to plant engineering and architectural design. Born from the need to cover the world of telecommunications, LA SIA is currently able to offer professionalism in the main fields of architecture and engineering. LA SIA has set the goal of becoming one of the reference companies of the large Italian industrial groups that operate, not only in Italy, but also abroad, and that have continuous needs of specialized technical support in the fields of Architecture, Engineering and Plant Engineering.

Contact info:
www.lasia.it

Strenghts:
efficiency, planning, skill

Libra AI TECHNOLOGIES

LIBRA is a SME aiming to bring machine learning (ML) innovation into real-life applications. In this direction, intensive work has been done, leading to a comprehensive toolbox of efficient algorithmic implementations of key ML techniques, emphasizing on its robust operation in realistic conditions. LIBRA is pioneering by using several cutting-edge ML technologies. In several Horizon 2020 projects, we focused on applications such as face recognition, audiovisual data classification, image segmentation and restoration, and business analytics.

Contact info:
www.libramli.ai

Strenghts:
machine learning, specialist, real-life application

Politecnico di Torino

POLITECNICO DI TORINO represents a leading public university, in Italy and in Europe, in technical- scientific teaching and research. POLITO offers excellence in technology and promotes the ability to carry out theoretical and applied research and also the capacity to achieve concrete and reliable productive processes or organise services and facilities. The Department of Architecture and Design (DAD) is the point of reference for the area of architectural technology and sustainable building design, art and science of design, architectural and urban buildings, and product and cultural heritage design.

Contact info:
www.polito.it

Strenghts:
excellence, concreteness, architecture

STAM SRL

STAM is an engineering consultancy company driven by technology innovation based in Genoa, Italy. The team is multi-functional, young and hungry and provides asset management digital solutions to the top European industrial players in the fields of energy, industry 4.0, space and defence and security and transports. They have gained a wide experience in the development of innovative solutions for industrial applications through years of cooperation, partnerships and support to and with the European industrial and R&I key players at all levels, in what can be described as a full Open Innovation approach.

Contact info:
www.stamtech.com

Strenghts:
consultancy, experience, open innovation

Tampere University

Tampere University was created in January 2019 as a merger of Tampere University of Technology (TUT) and University of Tampere (UTA). The multidisciplinary, foundation-based Tampere University is Finland's second-largest university with 20.000 students and 330 professors. TAU conducts scientific research in technology, health and society and provides the highest education within these fields. TAU is partner in the ECIU University, one of the first 17 Erasmus+ European Universities alliances that will become the universities of the future, promoting European values and identity, and revolutionising the quality and competitiveness of European higher education.

Contact info:
www.tuni.fi

Strenghts:
scientific research, future, learning

Tree Technology SA

TREE Technology S.A. is a Spanish R&D-performing SME providing information and communication technology solutions based on Big Data and Artificial Intelligence.
TREE works within an open innovation model to provide their customers with advanced ICT solutions, helping them to optimise their processes and improve their business. The R&D unit focuses on Artificial Intelligence and Big Data, integrating emerging technologies as part of the Smart Data ecosystem. Machine Learning and Analytics, Computer Vision, Cognitive Systems, Distributed and Scalable Computing, or Visual Analytics occupy a relevant position among the company's research lines.

Contact info:
www.treetk.com

Strenghts:
R&D, artificial intelligence, optimisation



UNISMART – Fondazione Università degli studi di Padova

UniSMART is the Foundation of the University of Padova, top ranked Italian University, in charge of managing all the technology transfer and innovation consulting activities directed to companies, industrial associations, professionals, investors, banks, and other public and private bodies – both on a national and international scale. UniSMART systematically assists its 5000 researchers from 32 Departments as well as its 60,000 students in maximizing the exposure of their research and talents, making sure it is brought in front of the most relevant stakeholders to generate impact on society.

Contact info:
www.unismart.it

Strenghts:
technology transfer, creativity, multidisciplinary



Inspiration

“The proper use of science is not to conquer nature but to live in it”

Barry Commoner

Connect with us!

Are you interested to stay updated about PRELUDE project developments?

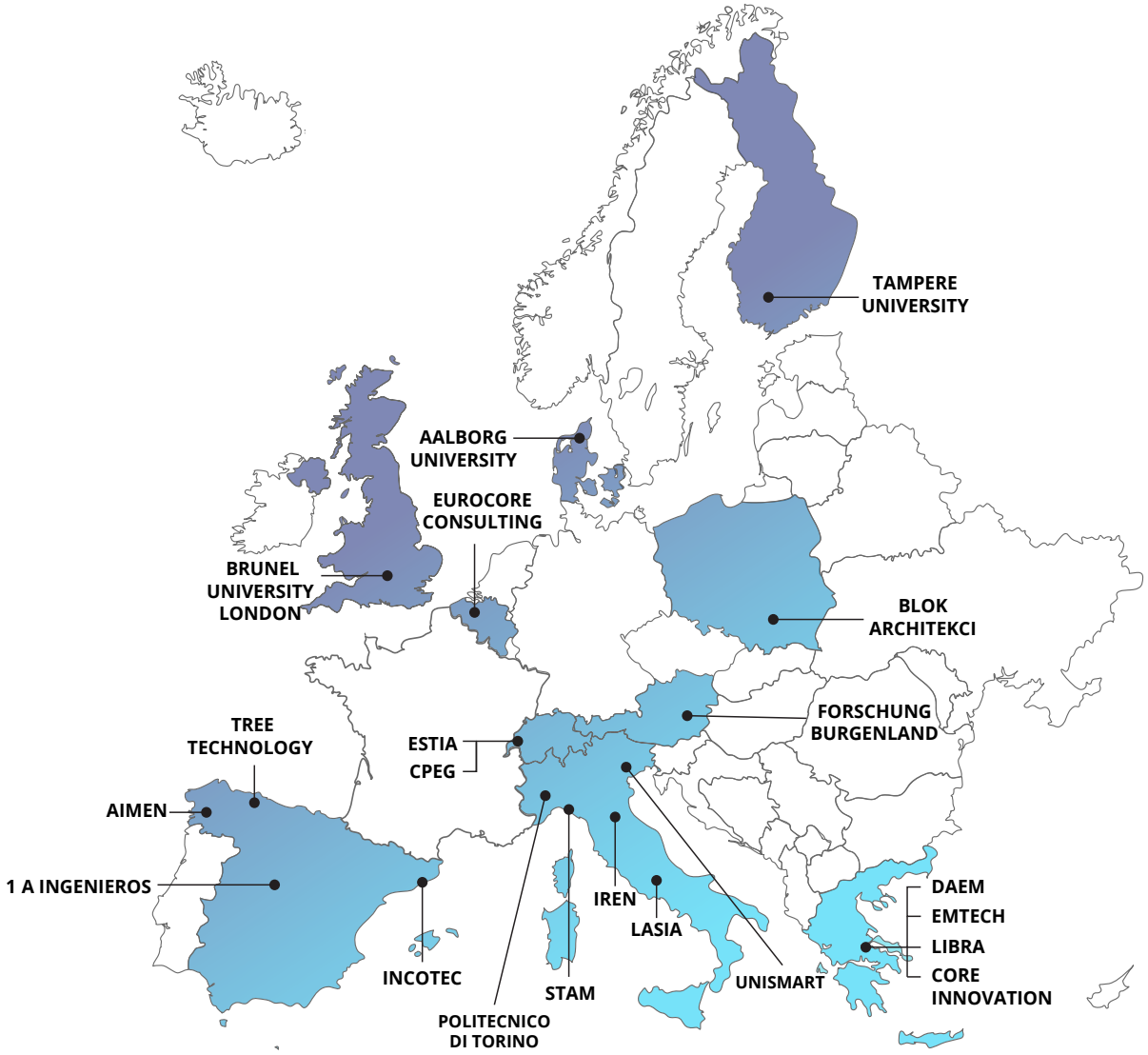
Are you a professional in the field of building or energy service providers interested in collaborating with PRELUDE partners?

Contact us to share your feedbacks and ideas on this page.

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stefano.giulitti@unismart.it

Partners



https://prelude-project.eu/

https://twitter.com/PreludeEu

https://www.linkedin.com/company/prelude-project/

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