



Auto-DAN

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

> Dr. Beatriz Fraga De Cal Project Manager – IES R&D









Agenda

- 1. Introduction
- 2. Objectives
- 3. Auto-DAN Platform
- 4. Demo Sites
- 5. Hardware Solutions
- 6. Results





Introduction - Project Relevance



- Europe is currently in the midst of a significant energy crisis with rising rates
- The residential market has been lagging resulting in increased energy dates in households
- Often there is a lack of visibility on energy consumption within households coupled with a lack of information of how best to reduce energy consumption



https://ecoelementspro.com/utah-home-energy-audit/







Introduction – The Team





Horizon 2020 Programme under Grant Agreement no 101000169





The basic intention of the Auto-DAN project is to provide home residents with the knowledge and information they need to reduce their energy consumption and energy costs in the least disruptive and most time efficient way possible. This will be achieved through the collection and detailed analysis of your energy data to allow us to provide you with feedback on possible actions you can take to reduce your energy bills in a simple and easy-to-understand manner using devices such as tablets.







Auto-DAN: Key Project Objectives





1. Create a flexible, smart hardware infrastructure that can be applied to all small-to-medium sized buildings

2. Develop an interoperable software architecture that can provide all the analytical capabilities needed to self-assess & self-optimize buildings in the EU





3. Deliver Augmented Intelligence (AuI) solutions to enable buildings and their users to become self-optimising

4. Create a live self-energy assessment method that incorporates operational monitoring, appliance/system performance and smart capabilities that will improve the accuracy of current energy assessment procedures





5. Accelerate investment in sustainable energy by EU companies (3rd Parties) & their clients.













Demonstration Sites – Energy Models





O Cualann A-Rated Homes, Dublin, Ireland



Palazzo Terragni, Lissone, Italy



VideBURGOS Foundation, Burgos, Spain







Demonstration Sites – Energy Models





Delta Ecpoc Cooperative, Milan, Italy



Residencia Camino de Santiago, Burgos, Spain



Greenogue & Aerodrome Business Park, Dublin, Ireland











Hardware Solutions





SUSTAINABLE

CES 2023

Communication Devices

This project has received funding from the European Union's Horizon 2020 Programme under Grant Agreement no 101000169



Energy Monitoring

RESULTS - DIGITAL OCCUPANCY MODEL

Auto-DAN

Helps single residential users to schedule their equipment for the following day to minimise the cost

Load disaggregation:

Breakdown of the building total from power meters into different appliances by using a developed optimisation platform

Load Clustering:

Process to obtain the most frequent pattern by using ML techniques

Next day demand side management optimisation.

Its dependent on periodic and non-periodic appliances (i.e. fridge) and recommends shifting schedules



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RESULTS - User Dashboards





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How to Keep in Touch





mption. Auto-DAN will create an augmented intelligence (Auf) solution that will deliver vation in buildings (of any size) and put the occupant firmly at the proactive centre of the building performance. Finally, Auto-DAN will also produce a new dynamic (and continuous) self-assessment methodology that takes into account the actual energy operational habits and the smart readiness indicator (SRI) of a building.

in buildings







https://www.autodan-project.eu/

https://www.linkedin.com/compa ny/auto-dan-project/about/

https://twitter.com/autodan proj ect?lang=en





How to Keep in Touch





Word From the Coordinator (Beatriz Fraga De Cal, IES R&D)

Auto-DAN is gradually going into the development phase while all equipment is getting ready for commissioning. Thus, we are in a crucial stage before testing the final solution.

In the last months, the consortium has completed Demand Response methods, developed Digital Occupancy Algorithms and also submitted the UX dashboards after an extensive user testing. They are all key aspects for the self-optimisation services that will help occupants reducing energy cost and peak demandh at the end of the project.

It's certainly not only an exciting period, but also challenging. We are currently putting big efforts into the the interoperability between technologies and ensure the Digital Twins can collect real data from each of the six demos sites. Also, the Augmented Intelligence Learning Manual is reaching completion.

Next month the Auto-DAN consortium are attending the next meeting in Milan. It's kindly being hosted by the project partner RINA. We are looking forward to meet in-person again since all agree that increases our engagement and collaboration.

In this issue we will introduce you to another of our partners, Delta-Ecopolis while also presenting the physics-based models of Auto-DAN Digital Twins. I hope you like this reading and thank you so much for your interest in Auto-DAN.

Let's Meet the Project Partners!

At each newsletter we take the opportunity to introduce a new partner and find out their thoughts on the AutoDAN project. This month we are pleased to have the Delta Ecopolis team discuss their role in the project.

How did you come to know about the opportunity to join Auto-DAN Project's Consortium?

We were contacted by a contact we had in Rina who knew our reality and was aware of our desire to participate in a European project

Why did you decide to join the Auto-DAN project's consortium?

For us it was a precious opportunity in terms of growth and knowledge.

In your opinion, what are the most interesting innovations and future impacts of the Auto-DAN project?

I find the involvement of the user, who is often a passive subject in monitoring processes, very stimulating. I believe that giving instant feedback or the use of energy can help change habits towards a logic of savings, including economics.

Is it the first time that you are working for a H2020 research project? If no, was your previous experience useful for the development of Auto-DAN? How?

It is the first time that we are working on an H2020 research project. It is really very stimulating and above all it allows us to see aspects that are uncommon for us and to grow.

Which is the contribution that your company/institute provides within the Auto-DAN project?

We are a demo site and have made available 15 accommodations and 2 offices for you to work with Auto-Dan. We must therefore thank the families who live in our building for having agreed to collaborate on this project which we hope will then be replicated.

In Focus: Physics-based Digital Twin

As part of Auto-DAN solution, the Digital Twins of the buildings are an essential piece for the final deployment of energy optimisation services.

The KL Environmental Digital Twiss are capable to connect physical and virtual exerts such as sensor, meters and BMS systems. In order to do that, the first step is creating the physical building models, in the last strontho, we have completed the dynamic simulation modelling of all plot sites considering minorer, and complex Dermo-dynamic separation of each building. These physics-based models are capable to predict the energy performance and user behaviour plot the calibration with three-series-data and the creation of Digital Twiss.



The next stage of the project is to collect data streams from the all denois stim and calibrate the developed physics-based models, which entablish the baseline of the building below real-data is available. Exactly 2D models of this deliverable will be further integrated with occupational data coming from the smart hardware consider. As a result, the physics-based models together with on-site operational data will lead to the final Ogiah Twins that final the optimization measures of the Auto-DAT's solution.

Smart buildings in Europe

Project Final conference

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Past events

On 23 March 2023 the Smartbull4EU Final Conference was held in brownies (Beigium). Smartbull4EU aims to facilitate the exchange of information between EU-forded projects and national initiatives in the field of smart buildings and the related business, policy and media.

Auto-DAN had the great opportunity to take part in this conference and present its results and progress in a dedicated session!

Upcoming Events

From 14th to 15th June 2023 the 11th annual edition of Soutainable Fixees (SP2023) will be held in a hybrid format, with the in-person sessions hosted in Madrid, Spain. The conference will feature served activities related to the sustainability sector, to support and promote the adoption of new technologies in energy efficiency in holdings. To this end, there will be routainable discussions involving local statesholders, different thermatic workshops dustring European projects and the opportunity to present scientific publications on the field of astainability. Auto-DAN will submit some papers with the aim of taking part in this interesting event

From 12 to 14November 2023 Vasia (Finland) will hosted the international Conference on Future Energy Solutions (FIS2023), FES2023 is a golden opportunity to here new research, ideas and initiatives; as well as interact with key decision leaders in the energy-robated fields.

Delegates make presentations and discuss vertous issues including intelligent and sustainable solutions for future energy systems. It would be a great opportunity to participate with Auto-DAN project by submitting a paper?

A dissemination events for OCualann pilot itesidents will take place soon to inform and update them on installations!

From the 23th to the 24th of May, the Auto-DAN consortium will meet in-person for the Auto-DAN General Assembly, which will take place in Milan, Italy, kindly hosted by RINA. Also, the first Roadshow of the project will be held in the pilot site of Palazzo Terranil





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Thank You



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