



NEWSLETTER

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New generation of intelligent efficient District Cooling systems

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What is it?

INDIGO aims to develop a more efficient, intelligent and cheaper generation of District Cooling (DC) systems by improving system planning, control and management. This target will be achieved through the following specific objectives:

1.- Contribute to the wider use of DC systems (DCS) and motivate the competitiveness of European DC market by the development of two open-source tools:

- A planning tool for DC systems with the aim of supporting their optimal design;
- A library with thermo-fluid dynamic models of DC System components which will provide the designers detailed information about their physical behaviour.

2.- Primary energy reduction over 45% addressed by a ground breaking DC system management strategy focused mainly on energy efficiency maximization but also on energy cost minimization. Its main characteristics is the predictive management but it also will address other challenges such as:

- Integration of Renewable Energy Sources;
- Dealing with different types of cooling sources;
- Suitable coupling between generation, storage and demand.

All this, with the help of intelligent and innovative component controllers (Predictive Controllers) to be developed at all DC system levels. Some of them include embedded self-learning algorithms, allowing components to respond appropriately to the set-points established.

Developments carried out within INDIGO will be validated in a real District Heating and Cooling installation with appropriate conditions for testing the new functionalities.

Project facts

Project Type: Research and Innovation Action

Start Date: March 2016

Call: H2020-EE-2015-2-RIA

Budget: €2.229.321,25

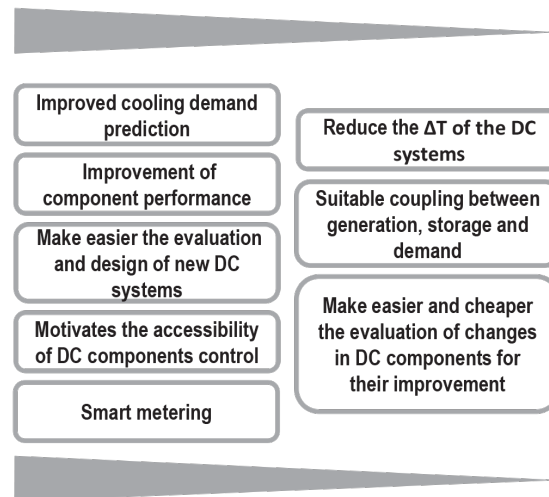
Duration: 42 months

From outcomes to impacts: The INDIGO value chain

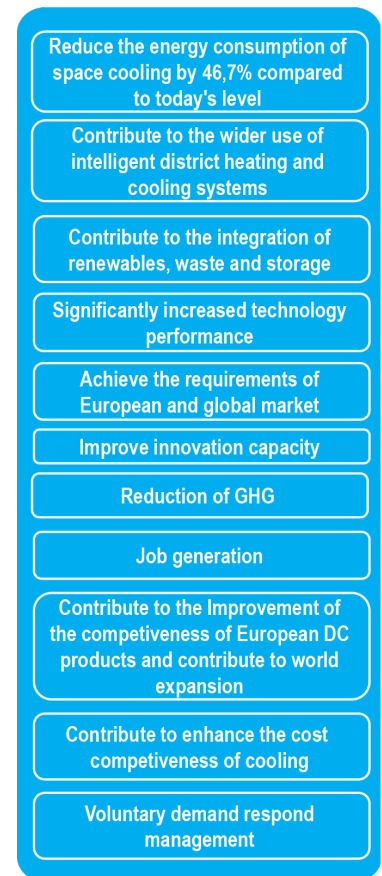
OUTPUTS



OUTCOMES



IMPACTS



Pilots

The benefits of INDIGO's developments will be validated in two real District Heating and Cooling installations with appropriate conditions for testing the new functionalities:



Basurto Hospital (Bilbao, Spain)

Basurto was erected in the first decade of the 20th century and currently comprises more than 15 buildings, most of them maintaining their original architectural special features.

Heating and cooling demands are satisfied thanks to a DHC installation connected to a trigeneration plant (electricity, heat and cold). The DHC system was erected inside the hospital area in 2003 by Giroa-Veolia, and extended in 2011. This company currently operates the system and also the HVAC in the buildings.



Zona Franca-La Marina-L'Hospitalet area (Barcelona, Spain)

The District Heating and Cooling (DHC) installation is a big city project, with the aim of supplying heat and cold to a 15.000.000 m² area in the Barcelona Harbour surroundings. The construction and exploitation of the district belongs to Ecoenergies Barcelona. Currently two generation plants (heat and cold) are constructed and first consumers are connected to a grid of 5 km total length.

Kick-off Meeting

INDIGO's Kick-off Meeting was held in Bilbao, Spain on March 3rd and 4th, 2016. The event was organized by Giroa-Veolia. It was a great opportunity to introduce each partner and their capabilities, as well as explaining their contributions to the project.

The Project Coordinator gave a short introduction of INDIGO, describing the main objectives, the methodology that will be followed during the project implementation, the main results and impacts that are expected to be accomplished, emphasizing the commitments established in the agreement. Then each Work Package Leader discussed the work to be done and the coordination for future actions. The partners also got to know the installations of the test-site, Basurto Hospital, which was useful for understanding the management and functioning of the cooling systems implemented.



KoM in Basurto Hospital

Technical Meeting



Partners in Pavia

Six months later, the days 28th and 29th of September, 2016 INDIGO had its Technical Meeting hosted by R2M Solution in Pavia, Italy.

The Consortium discussed the work done so far and planned the work to do in the next months. It was a fruitful meeting with very interesting discussions and brainstorming sessions.

The highlight of the meeting was the technical visit to the Policlinico di Milano. The hospital has a district heating and cooling system, connected to a tri-generation plant, operated by Veolia Italy. It was a good opportunity to

review and compare the existing systems and planning with the ones in INDIGO's demo sites, specially with Basurto Hospital.

It was decided that the next General Assembly meeting will be hosted by NUIG in Galway, Ireland.

Activities

- New Generation of Intelligent Efficient District Cooling Systems. NUIG. Research Night at NUIG. 02/03/16. Galway, Ireland.
- Development of Efficient District Cooling Systems. R2M. Workshop: Sustainable Places 2016. 29/06/16 Anglet, France.
- ICT-Technologies for Energy Efficient Buildings and Districts. VTT/ IK4-Tekniker. Conference: 41st IAHS World Congress on Housing. 13-16/09/16 Algarve, Portugal.
- INDIGO video: "Partners Interview" in [YouTube](#)
- INDIGO project is featured in EC [document](#) showing support in the Heating and Cooling Sector



Logo SP 2016

Interview to the coordinator



IK4-Tekniker building in Eibar

IK4-TEKNIKER is a technological centre legally constituted as a private not-for-profit Foundation that aims at the development and transfer of technology to improve the competitiveness of industry.

The Mechanical Engineering Unit at IK4-TEKNIKER has experienced in designing, simulating and testing thermo-hydraulic components and systems for different applications like district heating networks, solar thermal processes, refrigeration circuits in Machine Tools and Stirling engines between others.

The unit has more than 5 years of experience in multi-physical modelling based on non-object-oriented Modelica® language, one of the most promising tools for complex physical system modelling. The development of Modelica libraries for District Heating components and heat transfer can be highlighted as last remarkable achievements of the unit.
<http://www.tekniker.es/en>

Susana López, Researcher of the Mechanical Engineering Unit

Project Coordinator and Scientific Coordinator in INDIGO.

- Role in the Project: Regarding project technical tasks, IK4-TEKNIKER will be in charge of developing several simulation models for the library of DCS components, intelligent and innovative local controllers of some of the DCS components, and a ground breaking and optimized DCS management strategy.

- Expectations from INDIGO: As project results, IK4-TEKNIKER expects to get new developments validated at real environment, which allow the improvement of cooling networks technology, and thus to be able to transfer the obtained results to the industry around us.

Moreover, we hope that the open results obtained from INDIGO, specifically the open tools that will be developed, allow public institutions and other stakeholders to promote the sector growth, by implanting new cooling networks and operating them in a more efficient way.



Susana López

Partners

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Research Alliance

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GIROA  **VEOLIA**

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VTT Technical Research
Centre of Finland Ltd (Finland)

 **csem**

CSEM, Centre Suisse d'Electronique
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NUI Galway
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R2M
RESEARCH TO MARKET
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www.indigo-project.eu



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