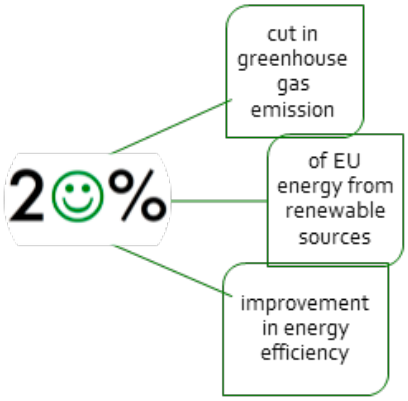
WHY?

As a project funded by the European Commission, Chess Setup is closely linked with the **European Horizon 2020** work Program. Thus, by implementing the already mentioned heating system, the initiative contributes to the following triple facet of the 2020 Program (based on 1990 figures).



The project is also aligned with the Energy Performance Building Directive (EPBD, 2010) which states that, by 2020, all new buildings should reach "nearly zero-energy" performance levels using **innovative and cost optimal technologies** with integration of renewable energy sources on site or nearby.

Chess Setup ensures that its system will have a short payback period and a reduced environmental impact compared to conventional systems, due to the low ecological footprint, the simplicity and availability of most of the elements involved.

WHO?

The Consortium gathers 10 members from five **European countries**:

FRANCE: edenway

GERMANY: EUROGRANT

THE NETHERLANDS: WANSDRONK ARCHITEKTUUR

SPAIN: BCN ECOLOGIA, Agència d'Ecologia Urbana de Barcelona; VEOLIA; lavola cosostenibilitat; Ajuntament de SantCugat; WATTIA

UNITED KINGDOM: Electric Corby Switched on thinking; University of ULSTER

USE CASES

Chess Setup will also include **three pilot experiences** carried out in:

SPAIN

SANT CUGAT DEL VALLÈS
Sport center

MANLLEU
Office refurbishment

UNITED KINDOM

CORBY
New dwellings

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 680556

CHESS SET UP

Combined HEat Supply System
by using Solar Energy and heaT pUmPs

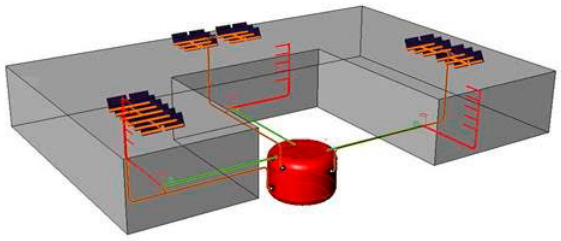
www.chess-setup.net

@ChessSetup

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 680556

WHAT?

Chess Setup has been created to respond to the increasing **heating and domestic hot water** demand in the building sector. The project aim is to design, implement and promote a reliable, efficient and profitable system able to supply heating and hot water in buildings mainly from **renewable sources.**

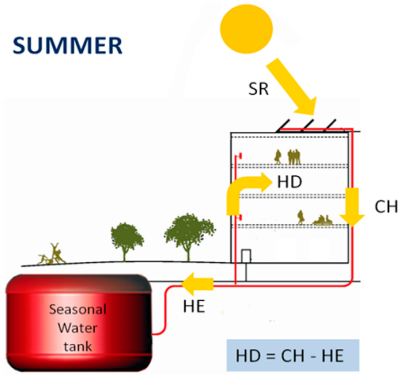


The proposed system is based on the **optimal combination** of hybrid photovolcaic-thermal solar panels (PVT), long term heat storage and heat pump use. These panels are a key element to achieve **self-sufficiency in buildings,** especially in dense urban areas where the roof availability is one of the most limiting factors.

The integration of **other energy sources** such as biomass or heat waste will also be considered, to make the system suitable for a broad range of conditions. The project will also explore the possibility to integrate other electricity or cooling technologies such as **cogeneration and solar cooling.**

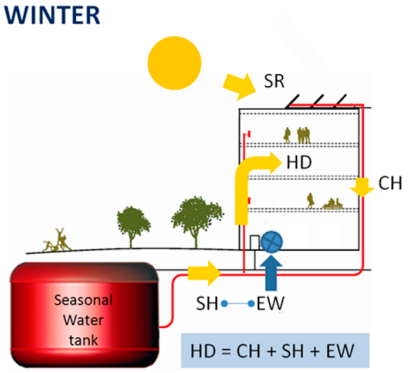
HOW?

In the summer season there is a **high** solar radiation (SR) and a **low** heat demand (HD). The share of the collected energy (CH) which is not required to the heat demand supply (HE) is **transferred** to the seasonal water storage tank to be stored.



SR= Sun radiation; CH= Collected heat; HD= Heat demand; HE= Heat excess heat; SH= Stored heat; EW= Electrical work

In wintertime, the heat demand increases and the solar radiation (SR) is **lower**. Therefore it is necessary to **absorb the energy stored** (SH) during summer from the seasonal water tank. The heat pump is responsible for transferring the heat and it is done with very **low electrical consumption** (EW).



WHAT FOR?

The main objectives and targets of the project are listed below:

- Implement a new heating solution based on a trio of technologies on a **seasonal mode** - hybrid photovoltaic-thermal solar panels, a thermal storage system and heat pump.
- Improve the initial system, and make it compatible with renewable energies' **back up sources**.
- **Test and monitor** the functioning of this system in different geographical situations and type of bulding, **along 3 use cases** and thanks to proper software.
- Develop business models from the use cases in order to **industrialize** Chess Setup's achievements.
- **Reduce the peak** of electricity demand, relying on the system inertia, and allow the renewable energies' connection to the grid.
- Reach a reduction **greater than 15%** of the investment costs compared to other highly efficient heating systems.