

Project Ideas and Search for Consortia Building for the Additional Joint Call

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Contact details

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Organisational profile

ITE is an international private non-profit technology centre created from business initiative and supported by the Valencian Government and the Politechnic University of Valencia. ITE supports energy sector companies in transforming their innovative ideas into business opportunities, as well as in launching innovative products and services. A team of 80 engineers and technologists perform R&D&I activities for companies in the field of smart grids, sustainable industry, sustainable transport and energy transition. Some of our labs relevant to SOLAR-ERA.NET are the Photovoltaic Flash Test lab, the PV, Wind and Thermal energy lab, the Active Demand Management lab, the Simulation, Algorithm and Prediction lab or the Smart Devices and Smart Grids lab.

What challenge area is your project idea focused on (topics according to guidelines):

Number and name of topic(s) addressed

- D) **Operation, diagnosis and system integration of PV plants**

Project idea – What’s in for you?

D3. System integration through ancillary services, e.g. solutions for a combination of load management / self-consumption, power management of the distributed PV generators and storage systems and dispatchable flexible capacities, which altogether assure a stable grid in spite of fluctuations of demand and generation.



- Power management platform for the optimal energy balance of demand and PV generation using flexibility from storage systems and electric vehicles. Optimization criteria: minimizing cost, peak shaving or flatten the load profile.
- Local control system to manage storage system based on power signal from the power management platform.
- SW for the optimal location of storage system in the distribution grid for a further integration of FV power plants

Our ideal partner:

- Industries working on Solar Electricity Technologies
 - Research Centres working on Solar Electricity Technologies
- **What we can provide:** services linked to the competences stated above in relation to chapter D of the call: Operation, Diagnosis and System Integration of PV Plants.
 - **Geographic area:** any SOLAR-ERA.NET eligible country
 - **Collaboration formula:** ITE can participate as a subcontracted organisation.



Contact details

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Organisational profile

«TOPRAK SMART FACADE SYSTEM LTD COMPANY» is a small startup focused on adaptive facade systems. SMART FACADE is the FIRST “adaptive façade” which is integrated with HVAC system.

In the state of the art, there exist systems such as a double-skin facade, ventilated facade, solar wall etc., which are used in envelope of buildings. They are mostly directed to energy saving based on the principles of utilization of natural ventilation and solar energy. Such systems operate independently of the central hvac systems; therefore, they do not reduce the installation cost. Moreover, their facade costs are very high when compared to conventional cladding systems and they cannot meet the heating-cooling requirement of the building, but they can only partly meet the ventilation requirement. In our design, Smart FACADE is integrated with central HVAC plant. Therefore HVAC and facade systems are designed simultaneously. We used very small openings for air circulation in the facade construction and it makes the system much more economic than «double facades» And lastly, we utilized a negative pressure zone on facade skin; therefore we can easily adapt the renewable energy sources to the building facades.

www.akillicephe.com

www.smartfcd.com

What challenge area is your project idea focused on (topics according to guidelines):

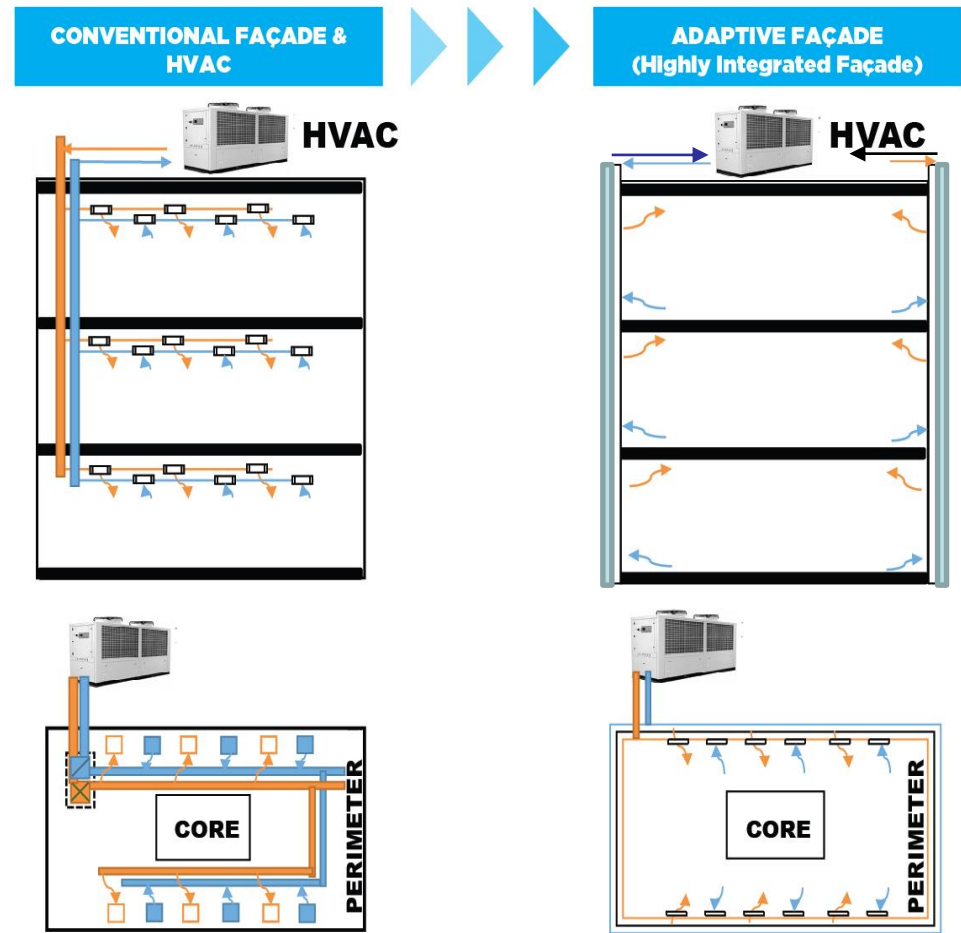
Number and name of topic(s) addressed

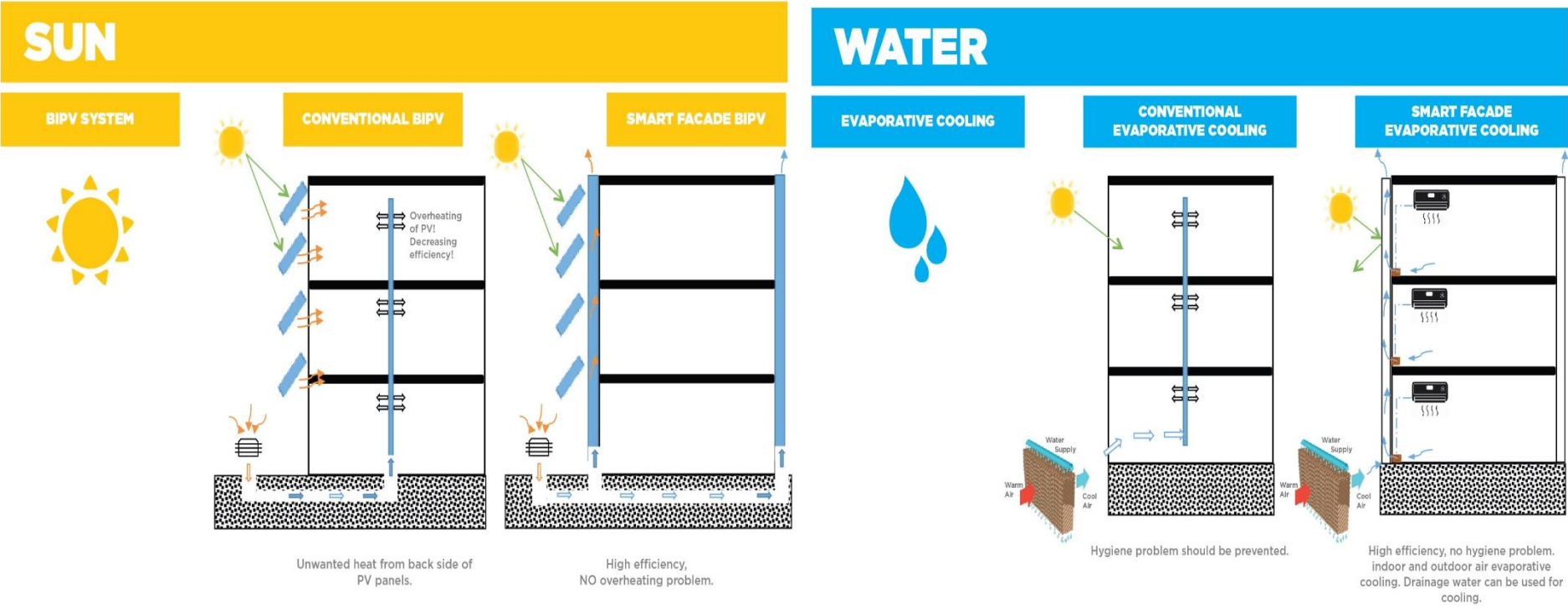
C) Building and infrastructure integrated PV

Project idea

PV panels can be integrated much more easily and efficiently with Smart FACADE.

Unlike conventional facades, SMART FACADE is integrated with the HVAC system via two separate skins (channels). With the help of these narrow channels, «ventilation» air can be circulated through the facade. Building fresh air need can be met by one of the channels (inner part). And the other channel (outer part) can be used to exhaust air thrown out of the building facade. Because, smart facade has negative pressure in exhaust channel, there is no hygienic contact with the building, and no risk regarding the bacteria growth. Therefore, air transmitted from any renewable energy sources (or any waste energy source) can be passed through this outer channel. And this provides great advantages in the integration of PV panels into the building facades.





Although solar panels are the most promising technology in terms of building energy saving, efficiency decreases due to overheating of the back sides of the panels in the summer and the building cooling energy load increases. The air circulation inside the SMART FACADE panels solves this problem of heat and increases the efficiency of the photovoltaic panels by 10-15%.

Although it is a good idea to benefit from underground heat, it cannot be applied very often due to the hygiene problem experienced in normal applications (dirt, bacteria etc. caused by condensation in the pipes) and the difficulty in integrating the air taken into the building with the existing ventilation system. SMART FACADE can receive underground air to the exhaust section of the «air channel», therefore, it does not experience any hygiene problems and is easily applied.

Evaporative cooling is one of the cheapest cooling methods. It can not apply easily in buildings due to hygiene problems and lack of integration with existing ventilation. One of the most interesting features of SMART FACADE is that it can benefit from evaporative cooling without any problem. Moreover, both the evaporative cooling of the outside air and the evaporative cooling of the exhaust air can be applied in high efficiency.