

building is developed. This represents the amount of energy consumed in a precise way.

Today the environmental awareness and maintaining comfort of residents are leading to a rethinking of the integration and utilization about innovative solutions for the habitat to offer more functionalities and better energetic performance.

Emerging of news computing technologies and communication on the home automation domain (Ethernet network, on-board Web server, e-mail and messages service, supervisory screen...) helps against some potential dysfunction or control parameter remotely.

To complement the first aspect related to access to information, a second research axis concern the strategy command to execute knowing that the main item is to minimize the energy used by a building. For example, it can be more interesting for an objective of thermal comfort in a room to act on the windows automatically applied then used reversible air-conditioning. However, this reasoning is valid for a room but it can't be valid for a house because of the different sun exposure. More generally, the command strategy to execute has to satisfy the constraints imposed by intelligent home for the comfort, the security and also the energetic consuming.

References:

1. Smart building: vers une gestion énergétique optimisée written by Fabien Clanche, Jérôme Gautier and Frédéric Hamelin. Published on <https://hal.archives-ouvertes.fr/hal-00827454>

THE STORAGE OF ELECTRICAL ENERGY. CAPACITORS AND SUPERCAPACITORS

A. Perez

National Research Tomsk Polytechnic University

This article gives an overview of a fundamental problem of electrical engineering: the storage of electrical energy. And with the decreasing resources, storage of electrical energy is more than ever a necessity. An evolution is observable in this area but energy demand is still increasing. So we talked a primary means of storage: the capacitors.

In capacitors, the energy $W = \frac{1}{2} C.V^2$ is limited by the dielectric breakdown of the insulation. But it also proportional to its disruptor field (Ed) and permittivity (Eo.Er) $W = \frac{1}{2} Er.Eo.Ed^2$. There are different technologies capacitors:

Electrolytic technology but it is limited in voltage, energy as well as discharge power.

Ceramic capacitors are of interest for the storage of small amounts of energy.

Film capacitors are increasingly used, they achieve better performance but are more expensive.

New types of dielectric are contemplated, as well as a deposit thickness reduction, which could offer better returns but must then solve problems of electric fields.

The principle of supercapacitors is close to that of capacitors but the dielectric film is replaced by an ion-conducting electrolyte. Supercapacitors are typically placed in series unlike capacitors. This series connection may carry a risk of imbalance but this rarely occurs. The benefits of supercapacitors is obtaining better energy density but with a constant upper discharge time.

Substantial progress is observed in the areas of electrical engineering and electronics. But only the field of storage of electrical energy, has changed little. The capacitor to the advantage of being stable and have a long lifetime, it can also provide considerable powers. But its storage capacity is very low. For supercapacitors, greater progress is expected with a storage capacity and significant overload.

HOW TO ESTIMATE A PV PLANT PRODUCTION

F. AKAR

National Research Tomsk Polytechnic University

With the fossile energy decrease, renewable energy are more and more used just like Photovoltaic (PV). Nowadays, photovoltaic energy is growing fast. As real power plant struture or as small structure for private individual. Every PV plant is composed by the same things that they are big or small. Each P vis coposed by a PV generator witch provide a current, a voltage and an electrical power (IDC,VDC,PDC) coming from panels. This parameters are varying du to the environnement (Sunshining,tilt and temperature, infrastructures). The static converters, witch are the essential elements of the PV production line allow on one hand to extract by using algorithms (MPPT) the maximal power and on the other hand to transform DC into AC to be able to reinject it on the network or to use it directly according to applications. It remains however difficult today to know the performances in real conditions throughout the life expectancy of the power plant PV. To estimate and analyze performances of an installation PV, numerous Studies use a method named "Méthode de l'indice de performance IEC61724". Several models, based on this method, take counts various indicators. At the end a ratio is calculated (the sun's energy supposly received divided by the reference