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MONITORING, IDENTIFICATION AND ACTIVE COMPENSATION, BASED ON USAGE OF THE FAST STORAGE RELEASE, OF TRANSITORY REGIMES IN CASE OF INTERMITTENT FUNCTIONING REGIMES OF THE WHITE GOODS IN HOUSE

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Introduction:
The need for the implementation of the proposed active compensation solutions is for increasing of quality of energy and for protecting of the white good against voltage and power variation due to switching on-off of the white goods in the house. The paper considers as a representative consumption equipment the refrigerator, as one of main white goods connected to the power networks of the houses. Possible solutions for reducing the footprint of the transitory regime of such equipment is considered. It is also treated the aspect of enhancing energy privacy through reducing the pattern of such consumptions against fine-grained monitoring from outside.

Content:
The paper considers a possible structure of the monitoring and of active compensation of the transient variation of power consumption in house, which usually take place in periods of up to some seconds and then it is suitable for using small storage devices capable to release high power, e.g. in the kW/kWs range, for short periods of time.
Such an equipment should have current and voltage sensors, metering IC chips and computational system which records transitory patterns and which compensates them with IGBT switching devices and storage equipment based on supercaps. The supercapacitors are releasing the energy to compensate the transitory regime, as they are appropriate for small energies delivered in short time.
In order to be able to act in real-time, the computational system may use pre-recorded patterns of the white devices transitory regime, such that it can compensate with a better quality, by compensating already known patterns.
One additional outcome may be the increase of energy privacy. There are already published studies [1] showing that use of white goods in a house can be detected by fine-grained monitoring form outside the house. Even if this is not yet a real threat on privacy, the use of the proposed compensation solution may reduce the possibility of detecting white goods activity from ouside, based on the same compensation method.

Conclusions:
The system will improve the power quality of provided by the house power network with minimal supplementary cots and having as result an increase of energy efficiency, of life span of the white goods, as result of avoidance of critical regimes.
With today technologies, the system can be cheap and reliable, opening the way for a more detailed management of energy into the residential building power networks.
Enhancing energy privacy through reducing the pattern of such consumptions against fine-grained monitoring from outside is also a possible additional outcome of the proposed technology.