SmartCoDe: Microelectronic Platform for Smart Contol of Demand in Buildings and Environments

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Reductions in carbon dioxide emissions are often assumed to be achieved by new machines or improved processes in large. However, computer science and microelectronic systems do contribute in a very significant way. We give an overview of outcomes of the FP7 project "SmartCoDe". One major objective of this project is to provide an appropriate microelectronic platform for energy management in buildings and environments. Inexpensive, small, secure, and despite that ultra-low standby power microelectronic platforms or Systems-in-Package (SiP) are key requirements to enable application of methods from "SmartGrids" to really take place in all kind of devices.

Such a microelectronic platform must provide devices with a preferably wireless communication interface. In SmartCoDe, ZIGBEE is used as a wireless communication interface. Via this communication link, a "smart appliance" can exchange estimations or constraints for power consumption with a central energy management. The central energy management then considers local availability of power from e.g. photovoltaics or local wind turbines, and plans energy consumption of all appliances.

For economic success of "SmartGrids" the cost per "smart device" may only be marginal, because the saved energy or cost of such devices is pretty small (however, there are many such devices). This motivates considering mostly fully-integrated solutions.

For microelectronic implementation, low cost and ultra-low standby power while being connected with mains power supply are important research challenges. A challenge here is that low cost requires fully integrated solutions with a minimum amount of external components.

References

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