

# SMART MEASUREMENT SYSTEM AND METHOD OF POWER ESTIMATION FOR ENERGY MANAGEMENT APPLICATIONS

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## BACKGROUND

Demand Side Management Programs (DSMs) aim to reduce overall energy consumption as well as the resources used to meet the demand of consumers. The adoption of DSM initiatives is being established by the electric providers to diminish power demand during the critical periods of the power grid. These initiatives mainly depend on implementation costs and convenience for both the utility provider and consumers.

Current DSM programs and DSM systems are based on predicting aggregated utility consumption (i.e. day-ahead or hours-ahead), scheduled utility network control, and utility consumption reduction incentives require communication between the utility provider and utility consumers.

Such DSM programs and systems rely on utility network control signals exchanged between the utility grid and the consumers. To provide these exchanges, additional implementation costs are necessary. Such DSM programs may affect the comfort level of the electric utility consumer, adding some resistance to adopt such programs.

There is therefore a need for a method and system for managing utility resources, which is more easily deployable and scalable, while proving interesting for both the utility provider and consumers.

## TECHNOLOGY

The present technology relates to a method for detecting, in real-time, power grid electric transients, analyzing these transients and providing a performance index from local measurements at the consumer side.

The performance index represents the state of power consumption seen by the power network and can be used for load management purposes at the consumer side. The estimation of the power consumption is achieved through real-time signal processing method.

This method comprises a measurement unit and analog-to-digital conversion phase, a digital filtering process, an elementary statistical analysis and finally an estimation phase.

## COMPETITIVE ADVANTAGES

The technology permits a quickly deployable solution for load management responding in real-time and an adaptive manner.

The proposed method overcomes the communications required between the electric provider managing the power grid and the local controller at the consumer side.

The technology permits to implement DSM and grid friendly Home Energy Management System programs at the consuming facility side, based on local measurements and transient analysis, and reducing costs and complexity for a massive deployment.

## APPLICATIONS

- Home Energy Management Systems
- Demand Side Management programs
- Grid responsive / friendly loads

## TECHNOLOGY DEVELOPMENTAL STAGE

-Correlation analysis of the estimated performance index with weather, seasonal, day of the week and time of the day factors has been performed to confirm the potential of the proposed technology.

- Measurements on residential power systems in Trois-Rivières region have been used for validations.

## BUSINESS OPPORTUNITY

-Patent pending technology available for partnering and licensing opportunities

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