

OGEMA 2.0 – OPEN GATEWAY ENERGY MANAGEMENT

SECURE AND FLEXIBLE FRAMEWORK FOR ENERGY MANAGEMENT SYSTEMS

Motivation and Context

Not every plug fits in every socket – it is the same as in future energy management. Each manufacturer has its own devices with different communication interfaces and protocols. For each usage scenario the user needs separate devices and applications as well as software tools, which are usually not compatible.

Especially in the areas of Smart Energy, Smart Building, Smart Industry and Smart Facility Management these problems hinder a quick and easy installation and configuration and setup. A retrofit or expansion of existing systems is usually only possible with great effort and interruption of the operation. Often a connection to the »Internet of Things« is desired, but that involves the high risk of unauthorized access.

Our Solution – OGEMA 2.0

Fraunhofer IIS has developed an »adapter« for these devices and components. The flexible and secure open source framework for energy management systems OGEMA 2.0 is based on Java/OSGI and supports many popular communication interfaces and protocols. The dynamic channel manager enables interaction between various low-level communication interfaces and high-level device drivers. A uniform resource concept provides access and control of the energy supply, such as generators, storage systems and consumers. With an integrated web server, components can be configured and mobile access to resources and applications is available. Through the multi-level security concept, based on Federal Office for Information Security (BSI) requirements, a permission-based access for each user is possible.

**Fraunhofer Institute for
Integrated Circuits IIS**

**Networked Systems and
Applications Department**

Nordostpark 84
90411 Nuremberg, Germany

Contact:
Jasmin Specht
Phone: +49 911 58061-9335
jasmin.specht@iis.fraunhofer.de

Peter Heusinger
Phone: +49 911 58061-9310
peter.heusinger@iis.fraunhofer.de

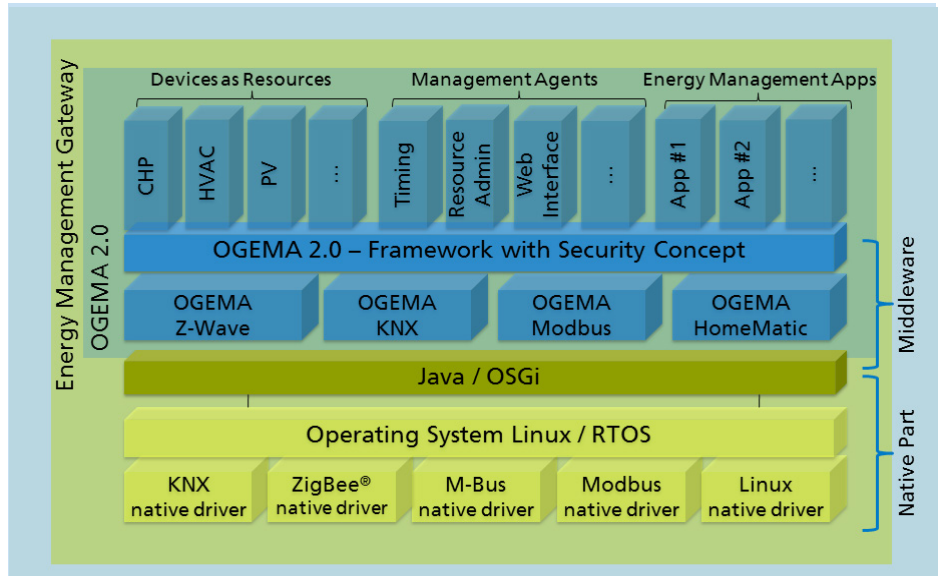
www.iis.fraunhofer.de/ogema

Application Scenario: Smart Building

The control and monitoring of buildings with the help of mobile devices reflects on latest trends. The offer of Fraunhofer IIS is: OGEMA 2.0 – a framework which integrates different systems, components and applications for energy and building automation and management. It enables the implementation of individual and needs-based solutions and applications, especially for local energy management. Typical applications include public buildings such as schools and hospitals, businesses and private households. Photovoltaic systems or combined heat and power plants can also be included in the OGEMA 2.0 system as well as household appliances and lightings systems. The framework is designed for modularity and therefore allows customized extensions and adaptations.

Application Scenario: Smart Industry

OGEMA 2.0 can be used to implement various function and processes in the context of Smart Industry. The energy consumption of individual plants and machines can easily be detected, displayed and optimized. The Framework allows the accounting for factual unit cost or individual process steps. By that the utilization of self-produced electricity is more efficient and accountable. OGEMA 2.0 also serves as interface to industrial plants or to control units (e.g. SPC). Standalone OGEMA 2.0 apps are easy to implement and provide the basis for programming. So an app can serve as an interface to the cloud or to other local and global components. With OGEMA 2.0 an individual production is facilitated with a lot size of one. As energy management in industry is becoming increasingly important, one of the priorities of OGEMA 2.0 lies in the optimization of the energy flow of individual panels and the sustainable and economic use of self-produced energy for the production process.



Modular Kit Structure of OGEMA 2.0 – Application Scenario Smart Building

Application Scenario: Smart Living

For energy management in Smart Living the room temperature, humidity and carbon dioxide rate can be measured and displayed on mobile devices. An optimization for a healthy indoor climate is automatically done or by personal recommendations, local and remote. In addition, the system can generate warnings or alerts based on sensor information in various hazards such as smoke or flooding. The interaction of apps and devices helps you to save energy costs and increase the living comfort. In addition to the energy management purposes other applications like Ambient Assisted Living is feasible.

Your Benefit

OGEMA 2.0 is an open source framework, so it can effortlessly be tested with your requirements. Enhancements and adjustments are possible during the operation of the system. Permission-based access schemes enable secure data exchange between systems, applications and users. Special service applications simplify the configuration, installation and operation of energy management devices, systems and processes.

Unique Selling Proposition

- Flexible extension and adaptation based on a modular system design
- Integration of many communication interfaces in one system
- Hardware independence of the framework
- Efficient use of storage
- Interoperability between various processes, services and technologies
- Access to data in the field and via Internet (IoT)
- Multi-level security concept
- Permission-based access to data provides high data security and multiple user management
- Protect your networks against external attacks

Our Offer

As an independent research institute, we help to find the best solution for your problems and demands. With existing equipment, components and technologies we develop new and perfectly fitting solutions for your applications. Together with industry partners, we investigate the optimal and application-oriented solution.