Intelligent use of green electricity in industry: new research project at Jacobs University Bremen

The use of green electricity is a common practice for private households, but not for energy intensive industrial companies. How can they too succeed in consuming more electricity from renewable sources in the future? This is the subject of a project initiated by Hendro Wicaksono, Professor of Industrial Engineering at Jacobs University, together with SWT, the public utility company in Trier, and seven other scientific and economic partners. The three-year project is being funded by the German Federal Ministry of Economics and Energy with around 2 million euros. Around a quarter will go to Jacobs University.

A group of researchers from Jacobs University Bremen, the Karlsruhe Institute of Technology (KIT) and the Research Center for Information Technology (FZI) is scientifically supporting the project. "It presents us with interdisciplinary research challenges in the fields of energy and data management, artificial intelligence and production optimization," explained Wicaksono, the scientific leader of the project.

The research project includes the integration and processing of data from heterogeneous sources, such as power plant, sensor, weather and production data. "Therefore, we are developing a concept of data management and data integration using semantic technologies and a service-oriented architecture," Wicaksono described the task. Semantic technologies serve as a key technology in the use of "big data". They help standardize different types of data, to combine and to merge them.

The public utility company SWT operates more than 50 green power plants and is coordinating the project. "We provide the market with around 170 million kilowatt hours of green electricity every year," said Rudolf Schöller from SWT. Green electricity production depends on when the sun shines or when the wind blows, therefore it is subject to strong fluctuations. "Nevertheless, manufacturing companies need a predictable and reliable energy supply," stressed Thorsten Zoerner, Executive Director of the green power supplier STROMDAO, which is also involved in the project.

Two small and medium-sized companies with energy-intensive production processes are also involved in the project – Kautenburger, a special machine manufacturer from Merzig, and MaTec Gummiwerk, a manufacturer of molded rubber parts for technology. "We are confident that we will succeed in producing more efficiently and sustainably in the future," said André Henning, Managing Director of MaTec Gummiwerk. With devolo and Pumacy Technologies, two technology companies contribute to the development of technical solutions.

About Jacobs University Bremen:

Studying in an international community. Obtaining a qualification to work on responsible tasks in a digitized and globalized society. Learning, researching and teaching across academic disciplines and countries. Strengthening people and markets with innovative solutions and advanced training programs. This is what Jacobs University Bremen stands for. Established as a private, English-medium campus university in Germany in 2001, it is continuously achieving top
results in national and international university rankings. Its more than 1,500 students come from more than 120 countries with around 80% having relocated to Germany for their studies. Jacobs University’s research projects are funded by the German Research Foundation or the EU Research and Innovation program as well as by globally leading companies.

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In a new research project, Professor Hendro Wicaksono from Jacobs University is looking for intelligent ways to use green electricity together with partners.