What are the Most Important Research Challenges in Energy Data Management? (panel)

Torben Bach Pedersen
Aalborg University
tbp@cs.aau.dk

ABSTRACT

This panel paper aims at initiating discussion at the Fourth International Workshop on Energy Data Management (EnDM 2015) about what the most important research challenges within Energy Data Management are. The author is the panel organizer, extra panelists will be recruited from the workshop audience.

Keywords

Energy Data Management

1. RESEARCH CHALLENGES

The panel should try to answer (at least) the following questions:

- What are the research challenges within energy data management?

- What are their nature (scientific, technical, interdisciplinary,..) ?

- Which ones are the most interesting from a scientific point of view?

- Which ones are the most important from a societal point of view?

Below, some of the panel organizer's personal opinions on these questions are listed.

Research challenges within energy data management are abundant. Among the important scientific ones are a) the modeling and management of energy flexibilities, including more powerful flexibility models as well as scalable techniques for aggregating, scheduling, and disaggregating flexibilities; b) creating open and realistic benchmarks with associated open datasets; and c) development of robust and effective methods and techniques for predicting and forecasting energy consumption and production, as well as their associated flexibilities, at a very fine-grained level.

Technical research challenges include d) creating community-wide agreed-upon common definitions of data and information concepts, e.g., standardized ontologies specifying common concepts and e) the standardization of communication protocols, e.g., for communicating available flexibilities.

Interdisciplinary challenges, which are perhaps the most important from a societal point of view, include f) the interplay between hardcore data management techniques/tools and user-oriented human-computer interaction concepts to determine how and at which level of detail to interact with a smart grid system; and g) realizing the economic potential in energy data management systems by inventing, implementing, and taking to market new economics-based business models and energy taxation schemes that can ensure the (financial) interest, and thus the participaton, of all the many involved parties in solving the challenge of using very high rates of renewable energy in the grid. An example of such interdisciplinary collaborations is found in the Danish Totalflex project www.totalflex.dk.

2. PANEL ORGANIZER

Prof. Torben Bach Pedersen is full professor of computer science at Aalborg University, Denmark. He received his Ph.D. in 2000. His research interests span Big Data and business intelligence topics such as data warehousing, multidimensional databases, OLAP, and data mining, with a focus on non-traditional and complex types of data. He has published more than 140 peer-reviewed papers on these topics. He has served as PC Chair for DaWaK 2009+10, DOLAP 2010, and SSDBM 2014, General Chair for SSTD 2009, and on numerous program committees, including SIGMOD, (P)VLDB, ICDE, and EDBT. He has worked on energy data management since 2007, was involved in the MIRABEL EU FP7 project on energy data management, as is now leading the research in the large interdisciplinary Danish project, TotalFlex.