

Energy Data Management: Where Are We Headed? (panel)

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

ABSTRACT

This panel paper aims at initiating discussion at the Third International Workshop on Energy Data Management (EnDM 2014) about the important research topics and challenges within Energy Data Management. The author is the panel organizer, extra panelists will be recruited from the workshop audience.

Keywords

Energy Data Management, Architectures, Information Models

1. QUESTIONS AND CHALLENGES

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

- What was already done within energy data management, and what is still missing?
- What are the scientific challenges?
- What are the technical challenges?
- What are the challenges that necessitate an interdisciplinary approach?

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

One thing that is still missing is a broad range of open benchmark datasets that can be used to develop robust and effective methods for various energy data management tasks, e.g., datasets that provide detailed measurements of device usage and energy consumption at a fine-grained level for a larger number of households.

Several scientific challenges are still open, including a) the development of robust and effective methods and techniques for prediction of energy production and consumption down to the device level; b) the development of methods capable of extracting and predicting flexibilities in energy usage;

c) the development of scalable techniques for aggregating, scheduling, and disaggregating micro-level flexibilities, e.g., in individual device consumptions, to large-scale macro-level units suitable for balancing energy supply and demand at the higher levels;

On the technical level, there is still a lack of community-wide agreed-upon common definitions of data and information concepts, e.g., standardized ontologies specifying common concepts. Also, the standardization of communication protocols, e.g., for communicating available flexibilities, is very important.

Interdisciplinary challenges are perhaps the hardest to meet, and include the interplay between computer scientists developing scalable techniques for energy data management, human-computer interaction designers exploring how and at which level of detail to interact with a smart grid system, e.g., in the home, and economists developing new business and energy taxation schemes that can ensure the (financial) interest of all the many involved parties (consumer, producers, distributors, traders, balance responsible parties, etc.) while still generating a tax revenue at the same level as current schemes. An example of these disciplines continuously interacting to develop viable solutions for the truly smart grid is found in the Danish Totalflex project www.totalflex.dk.

2. PANEL/WORKSHOP 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.

(c) 2014, Copyright is with the authors. Published in the Workshop Proceedings of the EDBT/ICDT 2014 Joint Conference (March 28, 2014, Athens, Greece) on CEUR-WS.org (ISSN 1613-0073). Distribution of this paper is permitted under the terms of the Creative Commons license CC-by-nc-nd 4.0.