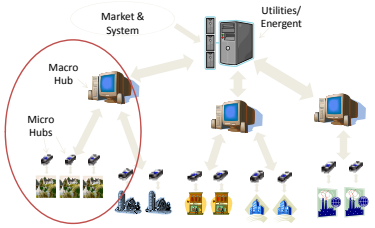
Energy Hub Management System's Streams

Software Stream

Purpose

Led by project partner, Energent, the purpose of this stream is to provide the 'plumbing' for bi-directional communications between the on-site 'energy hub' and the external data centre; connectivity between the energy hub and local energy consuming/producing/storing devices will also be established with on-site controls. Finally, appropriate interfaces - communicating information to energy managers - will also be developed.

Overall Structure



Hardware Stream

Purpose

Led by project partner, Energent, the purpose of this stream is to develop a single board computer platform that functions as the local 'energy hub' and that links effectively to the smart meter being used on-site (as well as to external sources of information and external repositories for data).

ZigBee™ [1]

BACnet™ [2]

Modelling Stream

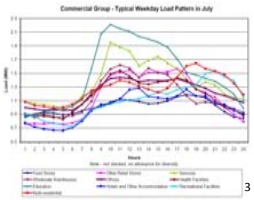
Purpose

Led by the Faculty of Engineering at the University of Waterloo, the purpose of this stream is to develop models that serve to optimize energy consumption, production and/or storage within individual energy hubs, as well as across collections of energy hubs.

Conservation and Demand Management (CDM) Modelling

The modeling of CDM includes the following aspects:

- Linear and dynamic optimization models
- Load Duration Curves
- Load behaviour models
- Customer and utilities' needs, and economics
- Comfort level of customers



[3]

Community Stream

Purpose

Led by the Faculty of Environment at the University of Waterloo, the purpose of this stream is to improve our understanding of how technological innovations could be effectively deployed in different settings -- more specifically, pilots in commercial, institutional and residential buildings, as well as agricultural and industrial businesses.

Encouraging Innovation's Adoption

Factors to consider when developing a strategy to recruit pilot participants include:

1) Relative advantage – innovation's perceived economic benefit, convenience, satisfaction, and status
2) Compatibility – how does the innovation fit with participants' values and needs, and with existing ideas and products in the marketplace?
1) Complexity – innovation's relative ease of use
2) Trialability – can the innovation be tested on a limited basis?
3) Observability – what is the innovation's public level of visibility? [4]

Energy Hub Management System

References

1 Zigbee Alliance. (2009). Accessed at http://www.zigbee.org.
2 Bacnet. (2009). Accessed at http://www.bacnet.org.
3 ICF Consulting (2005). Electricity demand in Ontario: A retrospective analysis.
4 Caird, S., Roy, R., Herring, H. (2008). Improving the energy performance of UK households: Results from surveys of consumer adoption and use of low- and zero-carbon technologies. *Energy Efficiency*, 1, 149–166.

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