Research Questions

- How can operational data knowledge help reduce this performance gap.
- Linking buildings and districts, how best to take a multi-level approach for energy management.
- What objectives/constraints should be considered for a holistic energy management decision.
- Can an ontological approach help conceptualise this theory.

Research gap

- In Europe, appropriate Building management systems (BMS) use can save up to 50% of the energy used. (Huber et al., 2015)
- Important to consider not just buildings alone but their interactions in an urban context. (Allegrini et al., 2015)
- Urban energy model should capture both supply and demand within a local context considering energy production, storage, transportation, and conversion to end service. (Keirstead, 2012)
- an urban energy model must be capable of incorporating a broad spectrum of technologies and should leverage existing methodologies through a common ontology.

AIM

An ontological approach to energy management for buildings and their districts using artificial intelligence.

Research Approach

- Action Research – Experience gained from involvement
  - EU FP7 – Sporte2 (Building scale)
  - EU FP7 – Resilient (District scale)
- Grounded theory approach - Reflective process of progressive problem solving.
- Working with stakeholders to address problems through use cases/scenarios
- Scope of research: Operational stages.

Research outputs

- District energy optimization technique using multi-objective genetic algorithms.
- R.E.M.O Ontology for aiding facility managers in decision making.
- Boost to BIM for holistic energy analysis

Publications


Title - An ontological approach to energy management for buildings and their districts using artificial intelligence.

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