

Energy Efficiency Networks for SMEs – Program Theory and Ongoing Evaluation

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Introduction – Untapped energy efficiency potentials

- Efficiency potential in Swedish industry: 12%
- Twice as high for SMEs
- Only half of the viable measures in energy audits are implemented



(Thollander et al., 2013)
(Anderson and Newell, 2013)

Introduction – Problems and solutions

- Lack of time, other priorities, lack of information are common barriers
- Success factors are long-term energy strategy, concrete goals, someone being responsible, full support from top management
- Industrial energy efficiency networks (IEEN) have shown to double the implementation rate, i.e. 100%
- IEENs provide SMEs with services and support



(Johansson and Thollander, 2017)
(Koewener et al., 2011)
(Thollander and Palm, 2013)

Aim of research



- Describe the theoretical underpinnings and characteristics of the project specific IEEN model
- Present results related to two key processes
 - Recruitment of companies
 - Energy audits
- Provide insights from applying program theory and ongoing evaluation to IEENs



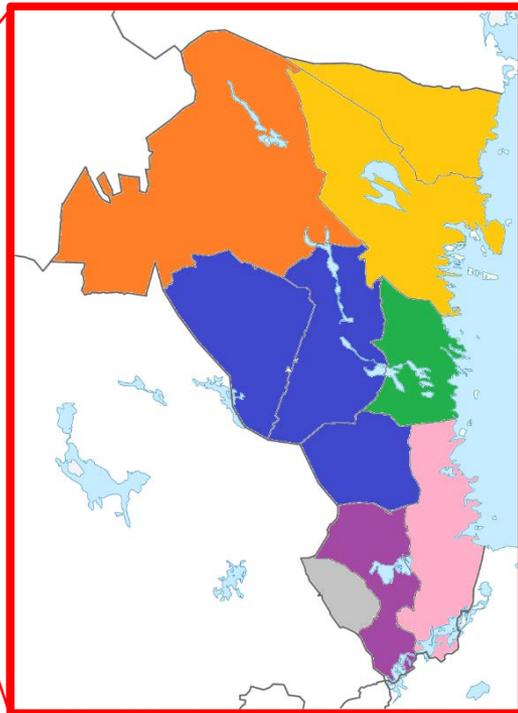
Industrial energy efficiency networks

- Key policy measures in Germany and Sweden
- Similar initiatives in Japan and China
- Stakeholders:
 - Network administrator
 - Network operator
 - Participants
 - Technical expert
- Provides SMEs with vital services and support
- Help SMEs to see technologies in a wider perspective



(IPEEC, 2016)
(SEA, 2015)

Project specific IEEN



Research pilot project

Implementation of IEEN regionally
in Sweden

6 networks in 9 municipalities

Targeting industrial SMEs

Financed by the European
Commission within the European
Regional Development Fund, the
Swedish Agency for Economic and
Regional Growth, Region
Gävleborg, and the University of
Gävle.



Project specific IEEN



Free of charge for participants



Last up to three years
Regular meetings



Initiating energy audits, formulating goals and action plans,
knowledge exchange and follow-up activities

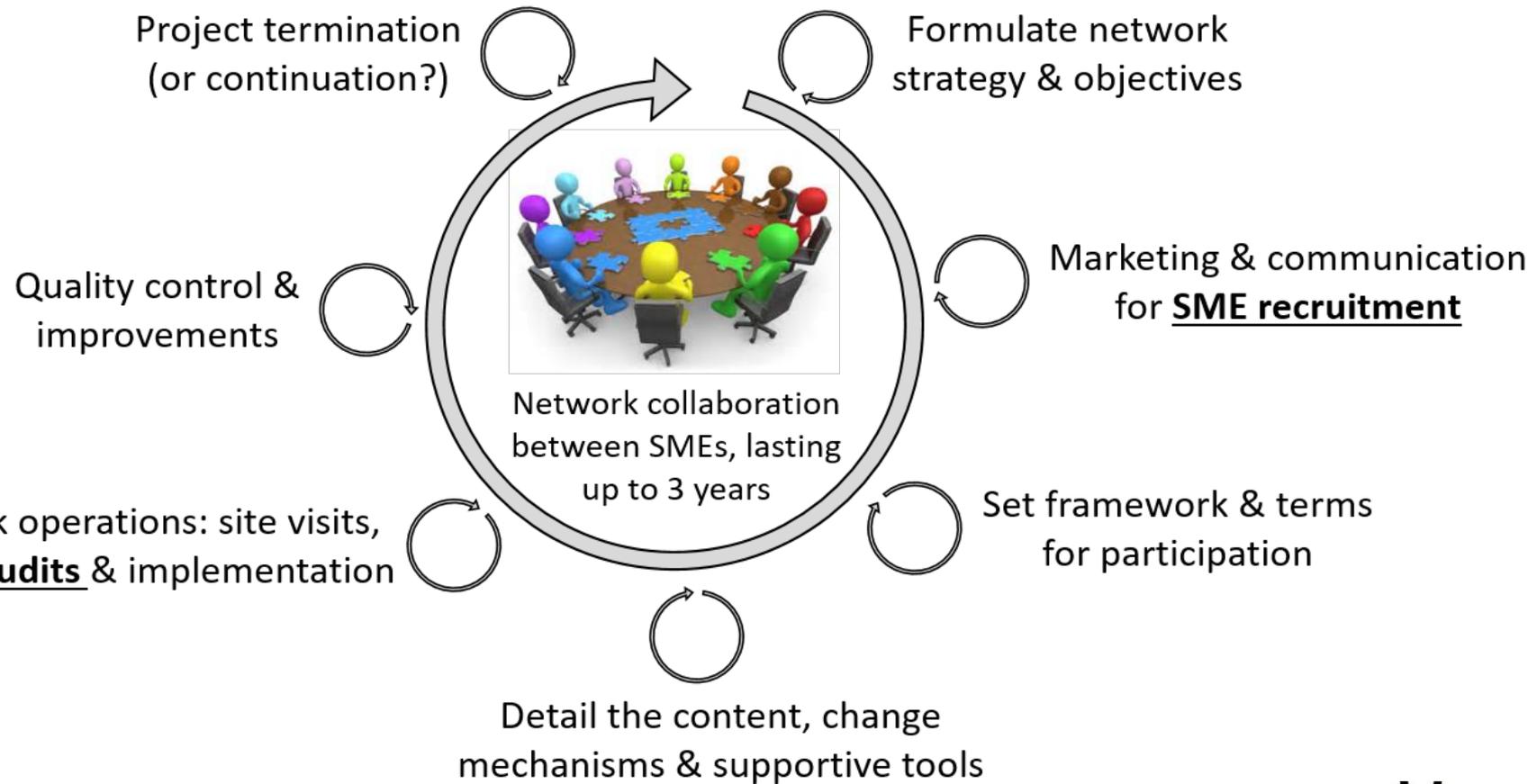


Innovative energy audit software
Available database of energy efficiency measures



Led by network operator

Key processes and logic for implementation



Combined evaluation approach

- Program theory evaluation:
 - clarifies project logic from the outset (see appendix of paper),
 - explores intended change mechanisms (see previous implementation logic),
 - search for project's strengths/weaknesses in relation to objectives/targets,
 - project logic serves as a yardstick for judging merits/demerits (rather than e.g. control group),
 - gives structure to evaluation plan and builds common understanding between evaluator and project organisation.
- Ongoing evaluation:
 - keep track on project implementation and external factors, to gain understanding about processes, deemed and achieved impacts,
 - involves mixed-methods but will require participation and dialogue,
 - aims to provide useful results and give continuous feedback to enable learning and improvement (i.e. being formative).



(Weiss, 1997)
(Svensson et al., 2009)



Results – Recruitment of companies

- **Barriers:**

- Establish contact
- Lack of time
- Lack of resources
- High workload
- Other priorities
- Management

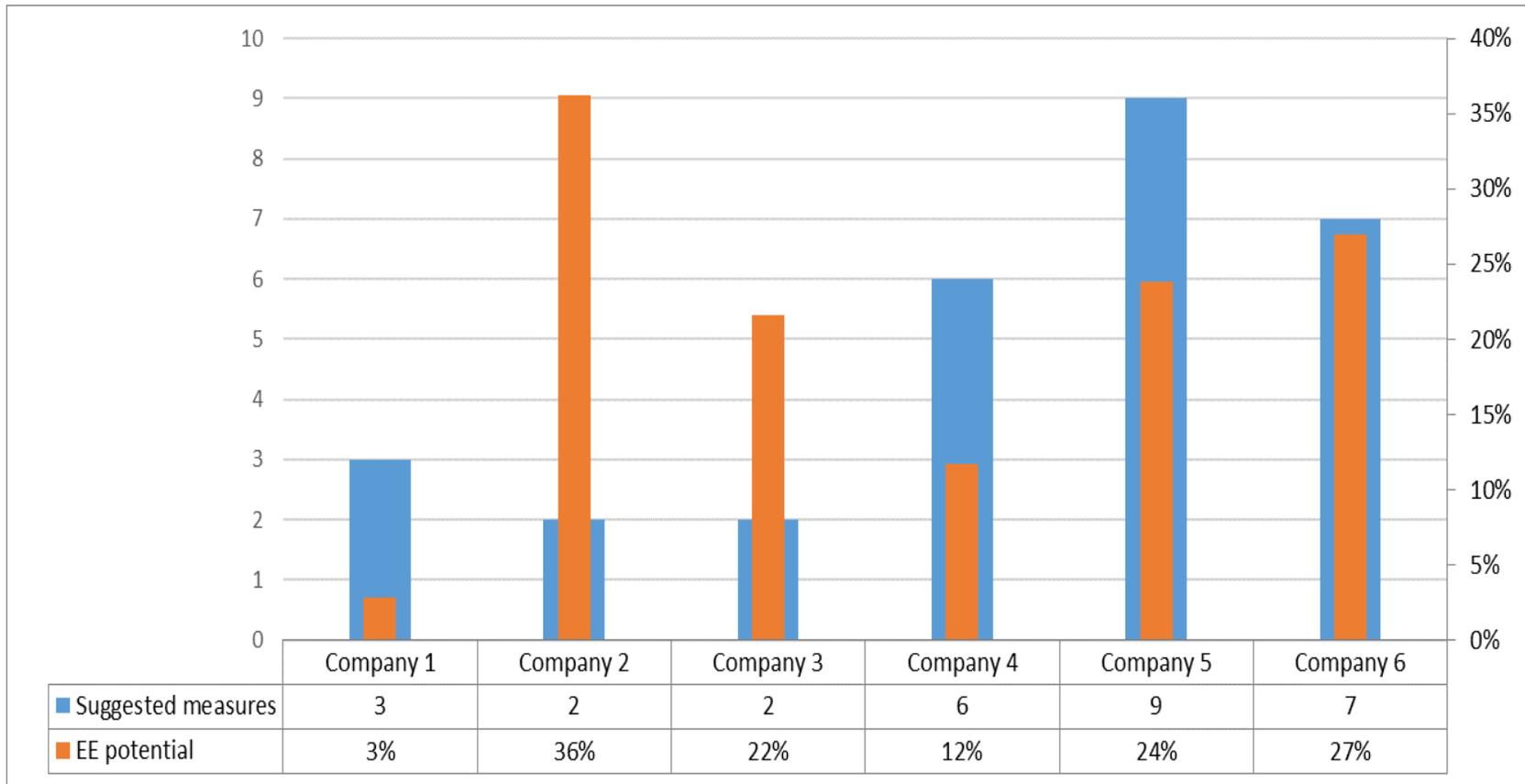
- **Drivers:**

- Interest in energy issues
- Decrease environmental impact
- Strengthen brand name
- Be a part of research project
- Share information and knowledge

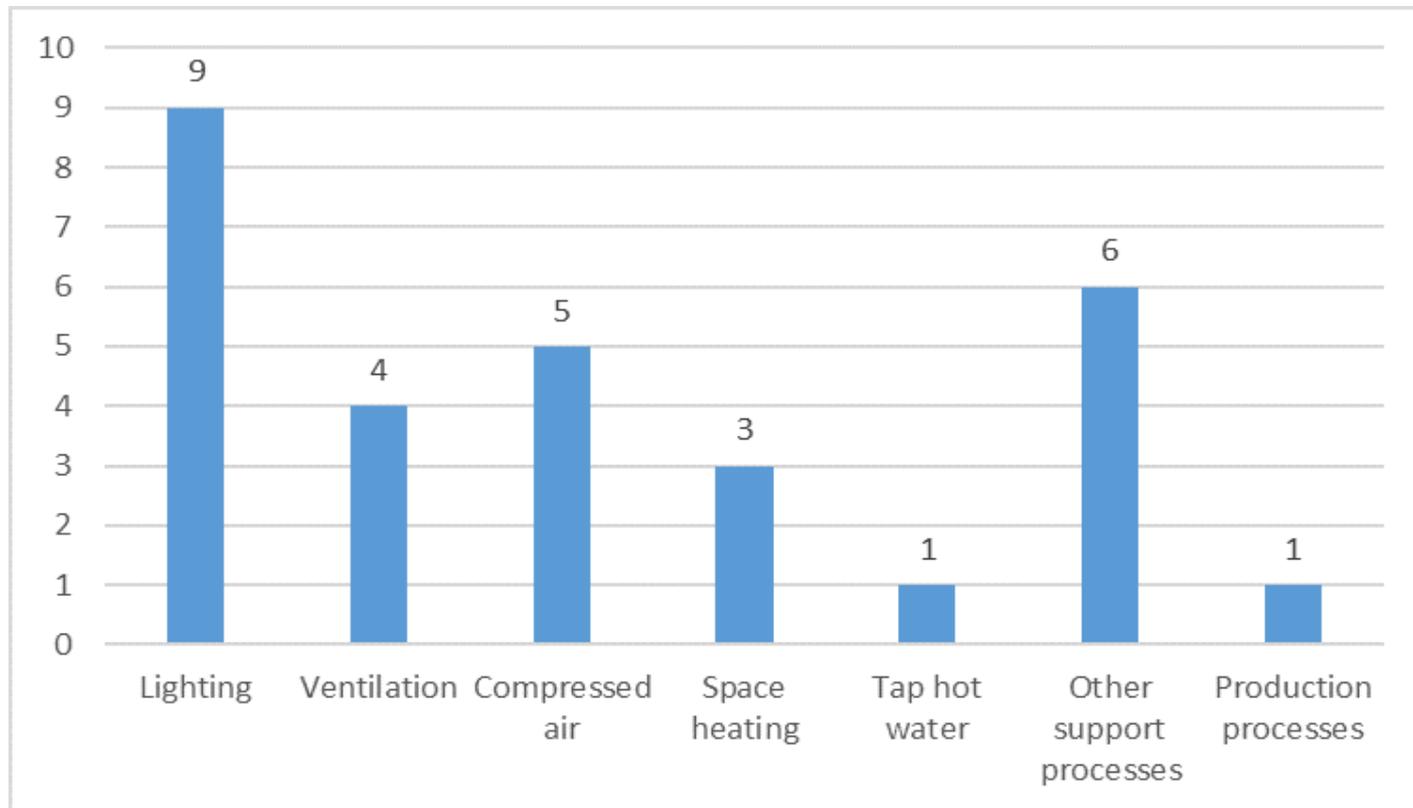
Municipality	Contacted companies	Participating companies	Output (%)
Gävle	18	7	39%
Ljusdal	26	3	12%
Hudiksvall	37	15	41%
Sandviken	17	9	53%
Bollnäs/Edsbyn	29	5	17%
Söderhamn	29	5	17%
Total	156	44	28%



Results – Energy audits



Results – Energy audits



Results – Evaluation findings



- Project is informed by solid evidence about potential for IEEN to promote and achieve energy efficiency improvement in SMEs.
- Recruitment is challenging → targeted output of 80 SMEs in ten networks is not yet achieved, which affects related output targets
 - time and resource consuming recruitment is preferably settled in a pre-project phase
- Energy audits point out energy efficiency potentials of around 30% in some SMEs, which if realized will fulfill the deemed long-term impacts.
- Pilot, knowledge-transfer, scale-up → forthcoming evaluation and dissemination activities important to provide main lessons to be learnt
- Project more than half way through, but most interesting aspects and change mechanisms related to network collaboration remains to reviewed.

Conclusions

- Combined evaluation approach contributes by clarifying project logic and identifying aspects that require attention.
- Suits the project type (i.e. pilot, research and implementation) and requires interactive evaluation, preferably introduced at early stage, to be formative.
- Out of 156 companies, 44 currently participates in a network (28%)
- Lack of time and staff were the major barriers for SMEs to participate
- Number of suggested measures in energy audits increased if the auditor was experienced or with access to database
 - Important with well-developed tools and training/certification of auditors
 - Database resulted in a more diverse range of measures
- Database is an important tool
- Formulation of goals and action plans
- Further evaluation ahead



Thank you for your attention!

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