

Evaluation of Danish energy efficiency programs

- What gaps exist in the evaluation of EE multiple benefits?

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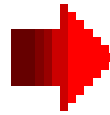
Production of liquid gasses

- Temperature of the cooling water influence on the energy consumption
 - Systematic metering, indicated rising temperature over time, due to smudge of the heat exchanger.
 - In spite of chemical treatment of the cooling water.
- Investigation suggested an ozone unit together with a sand filter
 - Temperature decreased with 1-2 degrees
- Energy saving: 153 MWh/year
 - Energy-only-payback: 3.6 years
 - Energy+chemical+reduced-labour-costs-payback: 0.5 year



Optimal diffuser design in fish farm

Traditional Trout Farm



Model Trout Farm



- Environment
 - Restricted feed quotas and restriction on water intake from the water course
- Increase in production
 - 2.5 higher production with same water intake



EVALUATION DESIGN

Examples

- Evaluation of energy efficiency obligation for energy companies
 - Ongoing
- Evaluation of Knowledge centre for energy efficiency in buildings
 - 2012
- Evaluation of all Danish energy efficiency activities
 - 2008

Non energy benefits

- Non energy benefits can be very individual
 - Improvement of building (maintenance)
 - Productivity
 - Ease of use
 - Aesthetics
 - Comfort
- End users are qualified to evaluate all these impact
 - Asking about overall satisfaction can reveal relevant information
 - Ask about the relative importance of energy and non-energy benefits

Evaluation of all Danish energy efficiency activities

General features	NEB evaluation
Portfolio evaluation	Questions about the overall satisfaction
Interviews based on experience with concrete projects	
Use of control groups	
Focus on net impact (free riders)	
Massive impact on Danish energy efficiency policy	

Evaluation of Knowledge centre for energy efficiency in buildings

General features	NEB evaluation
Review type of evaluation: Existing documents, interview with knowledge centre	Questions about the overall satisfaction
Interview with target group and control group	

Evaluation of energy efficiency obligation for energy companies

General features	NEB evaluation
Triangulation: Review of documentation / Interview with installers and end-users	Questions about the overall satisfaction to end-users
Control group	Questions about the overall satisfaction to installers
Statistical analyses about net impact	

Policy instruments

- End-users are strong decision makers
 - Know how to weight
 - Economic other benefits
 - Energy and non-energy benefits
- Some policy instruments are better in activating NEB
 - Taxes
 - All decision-making is left to end-user
 - Danish obligation for energy companies
 - Flexibility in designing instruments: End-users have an important say
 - The contrast: Labelling of house (old version)
 - Expert produce energy report based on in-flexible rules

Conclusion

- Many energy efficiency activities have challenges with net impact
 - Important to maintain this focus in evaluations
- Non energy benefits can be included
 - Asking about overall satisfaction
 - Asking about the relative benefit
 - Energy impact
 - All other impact

Danish NEB project

- Documentation of cases
 - Fish industries
 - Building materials
- Process and supply functions (pressurized air, ventilation, boilers, lighting)
 - Focus on productivity and reduction of failure rate
 - Analyses of accuracy and sources of error in NEB estimation
- Start in 2012 and completed in 2013

Thank you!

- Feedback is welcomed
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Paper about 2008 portfolio evaluation and its impact on policy:

- Energy Efficiency (2012) 5:37–49

Energy Efficiency (2012) 5:37–49
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SPECIAL ISSUE - VINE

A Danish case: portfolio evaluation and its impact on energy efficiency policy

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Abstract A political agreement from 2005 stated that an evaluation of the entire Danish energy efficiency policies in the evaluation. Examining the