NEB for dummies
Hands on non energy benefits
Steam Up aims to assess the substantial and easy to reach energy saving potential of steam systems in heavy industries, to support the EU objectives for energy efficiency. To this end, Steam Up is going to present concrete business cases to decision makers, based on 75 detailed audits from several European countries. A capacity building program for technical staff and consultancies ensures a good return on investments.

You can now visit the Energy Management Centre!
Find here an Introduction to the Energy Management Center!

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What is NEB?

- Any real or perceived financial or intangible benefit received from an energy efficiency activity.
The result of the energy audit

- Industry juice production:
  - Energy consumption:
    - Electricity 10,000 MWh
    - Heavy fuel oil 43,000 MWh
- Proposals
  - Compressed air 750 MWh (elec.)
  - Cooling 635 MWh (elec.)
  - Lighting 235 MWh (elec.)
  - Process 3,500 MWh (h.f.o.)

- Is this the right focus??
What are NEBs (co-benefits, total value of energy projects)

<table>
<thead>
<tr>
<th>Non-energy benefits from efficiency improvements</th>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Waste</strong></td>
<td><strong>Emissions</strong></td>
</tr>
<tr>
<td>Use of waste fuels, heat, gas</td>
<td>Reduced dust emissions</td>
</tr>
<tr>
<td>Reduced product waste</td>
<td>Reduced CO₂, NOx, SOx emissions</td>
</tr>
<tr>
<td>Reduced waste water</td>
<td></td>
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<tr>
<td>Reduced hazardous waste</td>
<td></td>
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<tr>
<td>Materials reduction</td>
<td></td>
</tr>
<tr>
<td><strong>Production</strong></td>
<td><strong>Working environment</strong></td>
</tr>
<tr>
<td>Increased product output/yields</td>
<td>Reduced need for personal protective equipment</td>
</tr>
<tr>
<td>Improved equipment performance</td>
<td>Improved lighting</td>
</tr>
<tr>
<td>Shorter process cycle times</td>
<td>Reduced noise levels</td>
</tr>
<tr>
<td>Improved product quality/purity</td>
<td>Improved temperature control</td>
</tr>
<tr>
<td>Increased reliability in production</td>
<td>Improved air quality</td>
</tr>
</tbody>
</table>

Ref.  E. Worrell
How can they be assessed?

• Use the values from research 2.5

NON-ENERGY BENEFITS FROM COMMERCIAL AND INDUSTRIAL ENERGY EFFICIENCY PROGRAMS: ENERGY EFFICIENCY MAY NOT BE THE BEST STORY

Nick P. Hall, TecMarket Works
John A. Roth, TecMarket Works

The results indicate that businesses place significant importance on the non-energy benefits associated with the installed technologies, and that the value of these benefits are equal to about 2.5 times the projected energy savings for the installed measures. In summary, businesses report that the

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How can they be assessed? 2

- Questionnaire
  - Change, with positive value
  - Change, with negative value
  - Change, don’t know value
How can they be assessed?

- Calculation
  - Identify and describe the benefits associated with a given measure
  - Quantify the impacts
  - Assess which ones it is possible to put monetary value on
  - Assess which ones has a positive, negative or neutral value

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Case study – pump

Research from Danish project concludes that coating can:

- Protect a new pump from corrosion and erosion and improved energy efficiency
- Renovate and protect existing pumps, bring the pump back to year zero, and improve its energy efficiency compared to new
- Improved energy efficiency 3-29%
- Extended life time 2-3 times


So you save energy however the value of the reduced maintenance and downtime is worth much more

Industrial electricity use for pumps in DK 10%
Case Production of liquid gasses

Savings due to lower cooling water temperature:
153,000 kWh/year or 12,000 US dollar

However, "what did the company achieve besides saving energy?"

Reduced:
- Use of chemicals: 50,000 US dollar/year
- Corrosion inhibitor: 12,000 US dollar/year
- Reduced corrosion: 20,000 US dollar/year
- Reduced labour cost: not calculated
- Reduced down time: not calculated
- Reduced environmental influence: not calculated
- Better working environment: not calculated

- Pay back less than half a year
Intro to workshops, so what happens if you go from halogen to LED in the Kalkscheune?
What do you achieve besides saving energy?

• Reduced maintenance LED life 25,000 hours, halogen 1,000 hours.
  • Reduced procurement and installation costs.

• Reduced air-conditioning.
  • Less heat from LED, less air-con leads to less energy consumed by air-con, less time for air-con means less maintenance and extended life of air-con.

• LEDs reduce fire risk
  • May bee reduce insurance cost

• LEDs do not warm people up, which means people stay concentrated longer and more attentive. 😊

• LEDs give the Kalkscheune a green image
Workshop form groups with 2 - 3 in each 10 min group work, 5min for presentation, chose one

- G1 - Steam traps
- G2 - Technical insulation
- G3 - Improve boiler efficiency
- G4 - Reduce steam demand
- G5 - Improve condensate recovery
- G6 – Implement a leak seal program for compressed air
- G7 – Use high efficient motors
- G8 – Implement energy efficient design
- G9 – Improve the building insulation (envelope)
- G10 – Implement change of filters in ventilation units due to pressure drop over the filter

- G11 – Use of automatic light controls systems
- G12 – Use of sun protections on buildings
One by one the NEB are discussed with the responsible department, for maintenance as an example you ask the maintenance people what will an steam traps maintenance lead to reduced make up water chemical procurement better steam quality etc.

For each of the benefits you will discuss it is possible to put monetary value on the benefit or not, if yes calculate it if not assess whether the benefit is positive or not.
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