Energy Efficiency in industry
experience from Denmark

Anders H Kristensen, Chief Policy Adviser
Ukraine-Denmark Energy Center

Government cooperation on strategic energy planning between
Ukraine and Denmark
EE incentive in DK industry

- CO2 tax on energy consumption in all sectors introduced in Denmark in 1993
- Between 25 & 100 DKK/ton depending on type of consumption
- Revenue received from industry returned through tax compensations and through subsidies for investment in EE
- Precondition: Industry to enter into an agreement with Danish Energy Agency

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<tbody>
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<td>Heavy process no agreement</td>
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<td>Heavy process with agreement</td>
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<td>Light process with agreement</td>
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About agreements

• Agreement on Energy Audits and introduction of Energy Management Systems
• Obligation to implement EE investments with low pay back times
• Possibility to receive state subsidy amounting to 30% of investment
• Duration 1993 – 2013
• Examples of industries: sugar, malt, steel, aluminium, chemical, medical, paper, bricks and glass
• No. of agreements: ex. 370 (2000), 280 (2008) and 100 (2013)
# Stakeholders involved

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<thead>
<tr>
<th>Stakeholders</th>
<th>Roles</th>
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<tbody>
<tr>
<td>Danish Energy Agency</td>
<td>Agreements with industries, contact to tax authorities, delegated tasks to accreditation organization and accredited companies</td>
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<tr>
<td>Industries</td>
<td>Agreement with DEA, implements certified ISO 50001</td>
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<tr>
<td>Tax authority</td>
<td>Informed by DEA on industries entitled for subsidy</td>
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<td>Accreditation Organization</td>
<td>Monitors the accredited companies, close contact with DEA</td>
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<td>Accredited companies</td>
<td>Control of industries implementation of ISO 50001, close contact to DEA</td>
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<tr>
<td>Technical experts</td>
<td>Accompanying accredited companies certifying ISO 50001 etc. at industries</td>
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<tr>
<td>Special experts</td>
<td>Accompanying accreditation organization when accrediting companies</td>
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Timeline / Cost profile

- Natural delay in retransfers:
- Agreements being concluded during the first years
- Feasible EE investments identified as Energy Audits implemented
- Applications for subsidies and project implementation

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<tr>
<td>-205</td>
<td>-15</td>
<td>-25</td>
<td>335</td>
<td>175</td>
<td>250</td>
<td>355</td>
<td>460</td>
<td>570</td>
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- Net expense for industry during first years of taxation scheme
- Accumulated retransfers to industry
Conclusion

• Substantial impact on energy consumption and CO2 emission from industry
  – CO2 reduction of 330,000 tons/year calculated in 2013 based on projects implemented during previous 8 years (2006 – 2013)
  – 8 % reduction of consumption in industry equal to 3,7 PJ/year

• The Danish Industry agreements proved to be a strong tool to promote Energy Efficiency in manufacturing industry
  1. Raising awareness of consumption and cost of energy
  2. Tax on consumption increase feasibility for investment in EE
  3. Revolving tax payment finance subsidy scheme
  4. Subsidy scheme increase feasibility in investment projects further