The Danish Agreement Scheme and EMS

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The Danish Energy Agency
International Workshop, Mexico City, 19'th of August

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Outline

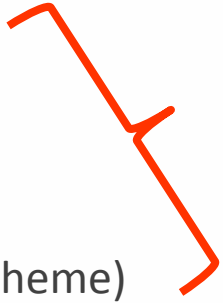
- Legal Framework Related to Energy Efficiency in Industry in Denmark
- The Danish Voluntary Agreement Scheme
- Cornerstones for Success in Industrial Energy Efficiency
  - Technical Approach
  - Management By-In
  - Requirements to EMS
  - Supportive Measures
- An Example

ENERGY POLICY ON EFFICIENCY IN INDUSTRIES

- POLICY ACTION ARE BASED ON NATIONAL OVERALL ENERGY STRATEGIES AND PLANS, INCLUDING ENERGY SAVING TARGETS BY SECTOR
- LONG TERN AND SYSTEMATIC EE POLICY (starting early 1990'ies, based on "Energy 2000")
- A NUMBER OF POLICY MEASURES COMBINED:
  - TAX ON ENERGY
  - **THE "VOLUNTARY AGREEMENT SCHEME" (starting 1996)**
  - SUBSIDE SCHEMES
  - A NUMBER OF SUPPORTIVE MEASUERS

Legal Framework for EE in Industry in Denmark

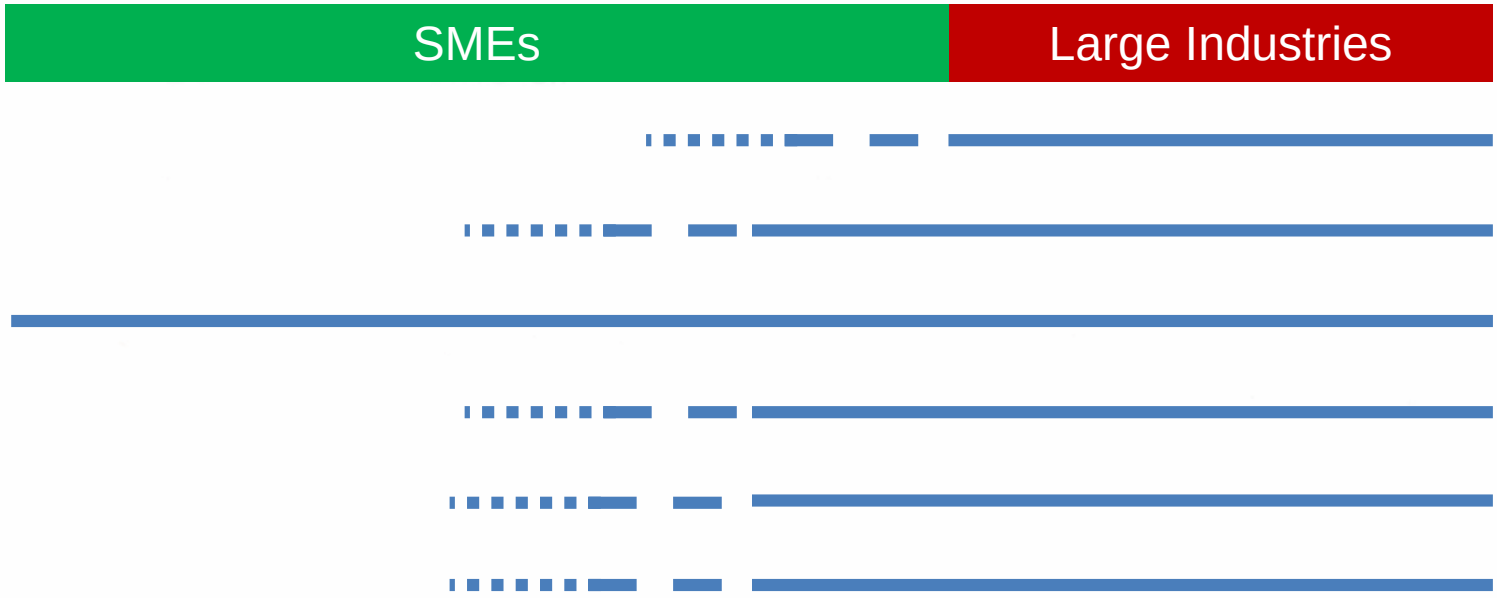
- European Emission Trading System (ETS)
- Voluntary Agreement Scheme*
- Energy Taxes (a number of measures)
- Energy Efficiency Obligation Scheme (Subsidy Scheme)
- Renewable Energy Subsidy Scheme (requires energy efficiency to be investigated)
- New European Energy Management and Audit Scheme for Industry and Buildings*



Economic instruments

**New mandatory European energy audit and energy management scheme to replace Danish voluntary agreement scheme*

Legal Framework for EE in Industry in Denmark



EU Emission Trading System (ETS)

Voluntary Agreement Scheme

Energy Taxes (several measures)

Energy Efficiency Obligation Scheme

Renewable Energy Subsidy Scheme

New Audit Scheme (Industry & Building)

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The Danish Voluntary Agreement Scheme

- Introduced in early 1990'ties
- The agreement scheme targets large industrial companies and large SMEs
- Scheme is based on a tax refund if companies implement certified ISO50001
  - A combination of "carrot" and "stick"
- In Denmark, 3 generations of the agreement scheme over 20 years:
  - Traditional energy efficiency approach (mandatory energy audits)
  - Focus on processes and energy management (DS2403 -> ISO50001)
  - New and advanced methodologies (LEAN and heat pumps etc.)
- The scheme is supported by a number of other measures
- Many lessons learned!

Management of Danish Voluntary Agreement Scheme

- The agreement scheme has comprised up to 300 industrial companies
- Resources to run scheme:
  - Managed by small dedicated team at Danish Energy Agency (6-8 persons)
  - A total of 30 consultants certified to carry out energy audits/special investigations
  - An industrial advisory board has been formed for periods
- Frequent adjustments of bottom-up requirements based on:
  - Experiences from frequent evaluations and feed-back from industries
  - New insights from data, pilot projects, surveys and specialists
- Important to have a vision and to “push” development of the agreement scheme

Results and Lessons Learned

- 1’st generation (1992)
  - Mandatory energy audits in large industries
  - Installation of meters for all significant energy users
  - Technical focus mainly on boilers, insulation, lighting
- 2’nd generation (1998)
  - Energy management system (DS2403)
  - Process focus
  - Special investigations
- 3’rd generation (2003)
  - Production, LEAN etc. included in special investigations
  - New utility and waste heat focus
  - DS2403 -> EN160001 -> ISO50001

Lessons learned:

- Small savings
- Technical approach was wrong
- Many meters hard to use

Lessons learned:

- Large savings
- Management buy-in important
- Operator influence (LEAN)
- New utility structures developed

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Energy Management Systems

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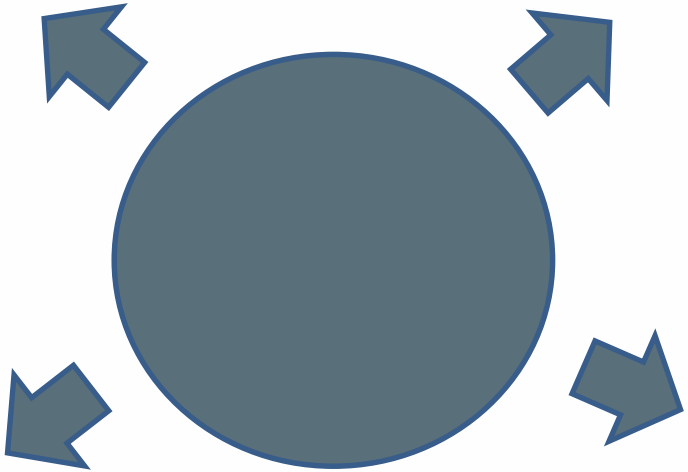
Cornerstones for Success of Agreement Scheme

Technical Approach

Management Buy-in



Supporting Measures

Buttom-Up Requirements ISO50001

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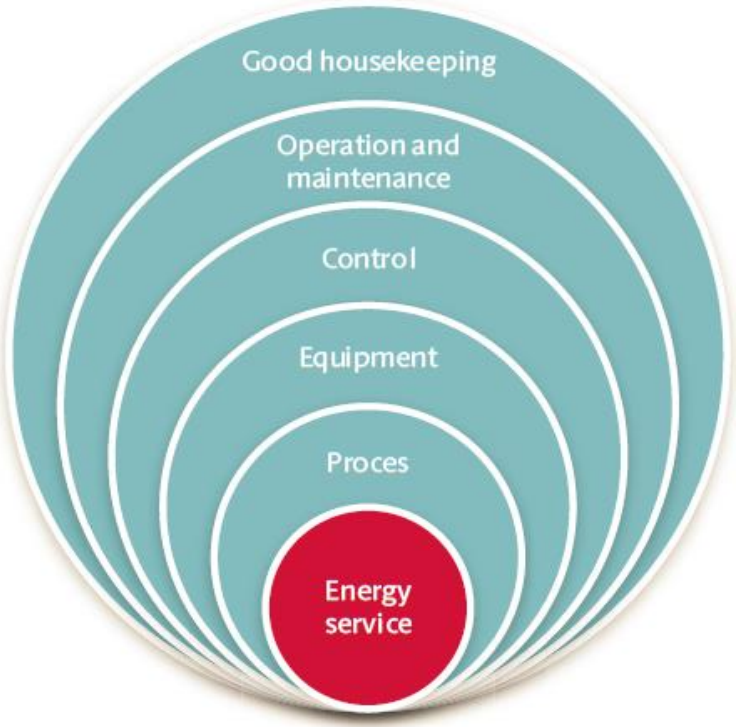
Technical Approach

Management tends to think that energy costs is about utility systems

Maintenance staff are asked to front energy efficiency activities/EMS

Our experience that most energy usage is bound inside processes and equipment

QA-people and process engineers etc. could also be engaged in EMS



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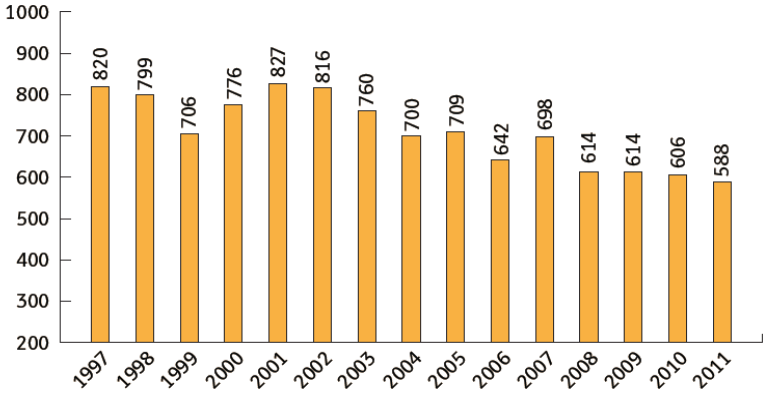
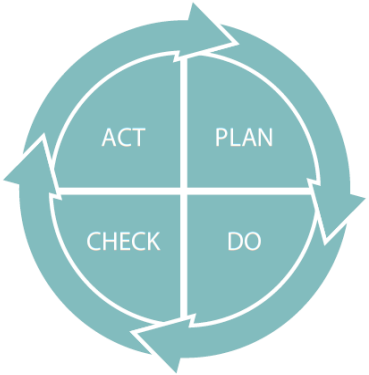
Management Buy-In

- A broad anchoring of energy efficiency necessitates top management to engage
- Energy efficiency is at its best not a about “quick wins” – it is a long term, continued and systematic effort with large savings
- Clear communication of responsibilities, resources, budgets and timelines are crucial as well as follow-up and evaluations should be carried out





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Buttom-Up Requirements ISO50001

For the Danish Agreement Scheme, the overall requirement to the companies is to implement energy management system according to IS50001

The Danish Energy Agency have launched additional requirements*:

- Energy mapping should be presented in breakdowns of a certain level of detail (by end-use)
- Energy saving projects are to be identified by saving potential and pay-back periods
- All energy saving investment projects with pay-back less than 4 years must be implemented
- Complex process energy saving analysis must be nominated as “special investigations” and carefully planned
- New investments should be planned following a guideline on “Energy Efficient Design”

**Experience has shown that it is important that the responsible authority sets quality requirements for energy efficiency work performed in the industries*

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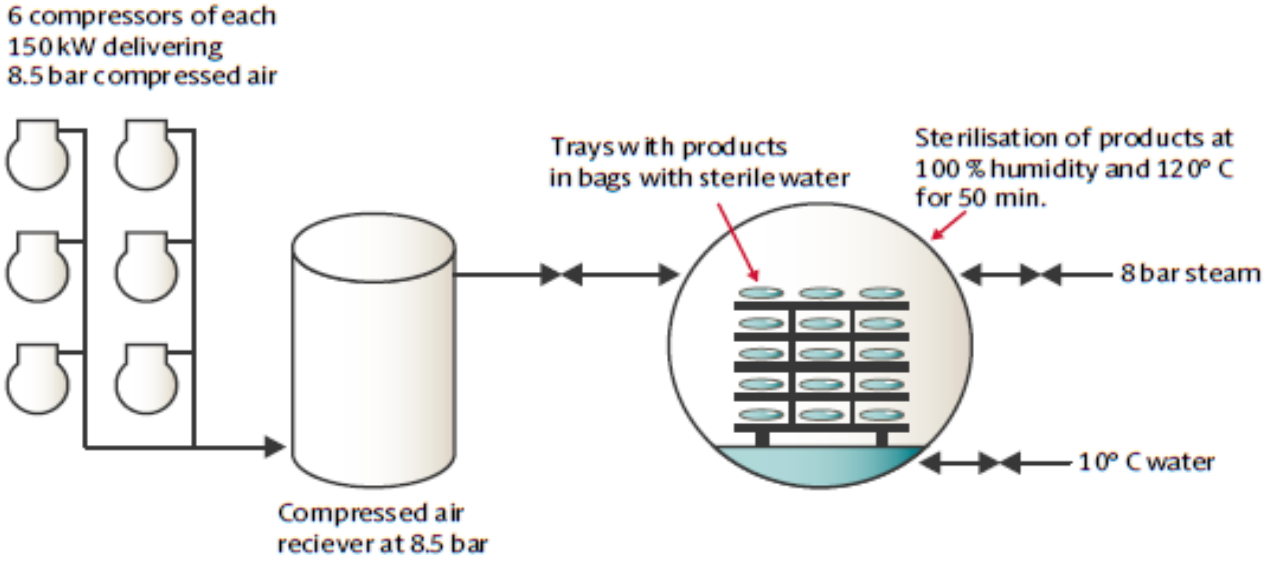
Supportive Measures

- Grant schemes necessary to support investments – industry often consider energy efficiency investments as risk-related and somehow out of strategic focus.
- Competence scheme for energy consultants and specialists necessary to support industry in more complicated saving areas, by example complicated processes
- Pilot projects to demonstrate new technologies and new ways of working are highly appreciated by industry
- Data and surveys necessary to identify and promote new efforts

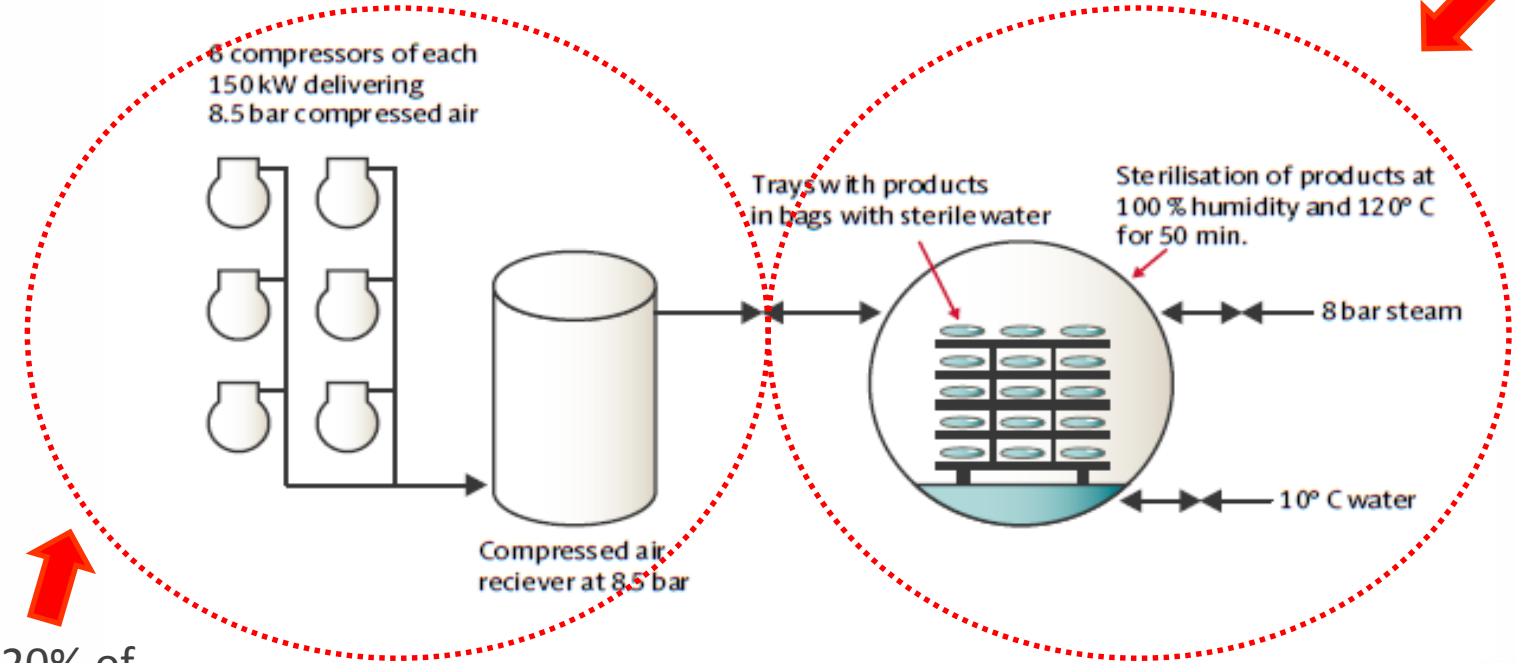
An Example

An Autoclave (Packed Food Products)



An Autoclave (Packed Food Products)

80% of saving potential



20% of saving potential

Management Danish Voluntary Agreement Scheme

- Managed by small dedicated team at Danish Energy Agency
- Frequent adjustments of bottom-up requirements based on:
  - Experiences from frequent evaluations and feed-back from industries
  - New insights from data, pilot projects, surveys and specialists
- Important to have a vision and to “push” development of the agreement scheme*

**Henry Ford:*

“If we had asked the costumers what they would like,
they would have asked for a faster horse”

Summary

- ENERGY EFFICIENCY NOT A STRATEGIC FOCUS IN MOST INDUSTRIES
  GREAT POTENTIAL FOR COST-EFFECTIVE ENERGY SAVINGS IN INDUSTRY
- GOVERNMENTAL ACTION NECESSARY
- LONG TERM PERSPECTIVE AND SYSTEMATIC EFFORTS NECESSARY
- INCOLVEMENT OF VARIOUS STAKEHOLDERS IMPORTANT
- EVALUATE AND FOLLOW UP ON A REGULARLY BASIS
- COMBINE A NUMBER OF EE-MEASURES (CARROT AND STICK)
- PROVIDE SECTOR WITH TOOLS, GUIDELINES, DATA, SURVEYS, ETC.
- KEEP RULES AND ADMINISTRATION SIMPLE

For more information:

Danish Energy Agency's new publication

Energy Policy Toolkit on **Energy Efficiency in Industries**
Experiences from Denmark

www.ens dk/lctu

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Thank you for your attention

Gracias por su atención

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