Energy saving

Brussels, 16 May 2013
Energy Experts International B.V.

Michiel Steerneman  
(Director/senior consultant)

Strategy development  
Implementation energy management  
Feasibility studies  
Project organization  
Engineering

Julianastraat 7  
P.O.Box 151  6850 AD Huissen  
t  +31(0)26 325 63 23  
f  +31(0)26 325 80 65  
e  info@eei.nl  
i  www.eei.nl
Characteristics and Topics

- Private, independent company
- Custom made advices
- More than 30 year experiences
- Energy is the core business
- Energy management (implementation and audits)
- Feasibility and energy studies
- Project organization

Customers

- Companies
- Industrial organizations
- Dutch ministries / local authorities
- EU
Products and services

- EU projects (benchmarking)
- Energy Potential Scan, CARE+ and Energy Audits
- Implementation energy management (EN 16001, ISO 50001)
- CSR-mirror in accordance with ISO 26000
- CO2 footprint calculations in accordance with ISO 14064 and 14067
- Feasibility studies (heat and cold storage, combined heat and power), project coordination

Branches and sectors

- Graphic industry
- Rubber and plastic industry
- Fruit and Vegetables processing industry
- Animal feed industry
- Chemical industry
- Glass industry
- Supermarkets
- Health care (hospitals and nursing homes)
- Paper and board industry
- ICT sector
The European flour milling industry is the leading food industry in grain processing, using around 45 million tons of soft wheat and rye a year to produce around 35 million tons of flour on an annual basis (EU-27).

The number of flour milling company exceeds 3 000, of which a large majority are small and medium-sized companies.

The industry employs about 45 000 people and represents a turnover of 15 billion Euro. The average use of capacity is about 65%.
The European Flour Millers have been contributing to the drafting of the Best Available Techniques Reference document (BREF) for the food industry. BREFs are the basis on which Member States can set emission limit values. These values are to be part of the environmental permit granted to industrial installations as a license to operate.

Wheat flour provides 310-340 kcal/100g (1320-1450 KJ/100g) depending on the type. (~14.000 MJ/ton)
Some calculations

35 million ton flour per year
Energy/nutrient content (1320-1450 kJ/100gr):
Total 490 million GJ = 490 PJ/year

In general an active man needs about 3.000 kcal/day (12.600 KJ/day) = 4,6 GJ/year

35 million ton flour is in terms of nutrient content enough for 106,5 million (active) people
The Product Chain from wheat production to consumer takes 19,000 MJ/ton flour and causes more than 1,800 kg CO2/ton flour.
### Gross Energy Requirement (GER-value)

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Unit</th>
<th>Total GER-value (MJ)</th>
<th>Non-renewable Share (MJ)</th>
<th>Renewable Share (MJ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potatoes organic, at farm/CH S</td>
<td>kg</td>
<td>4,9</td>
<td>0,9</td>
<td>3,9</td>
</tr>
<tr>
<td>Rice, at farm/US S</td>
<td>kg</td>
<td>29,9</td>
<td>12,6</td>
<td>17,4</td>
</tr>
<tr>
<td>Wheat grains, at farm/US S</td>
<td>kg</td>
<td>21,0</td>
<td>5,4</td>
<td>15,6</td>
</tr>
<tr>
<td>Sugar, from sugar beet, at sugar refinery/CH S</td>
<td>kg</td>
<td>29,1</td>
<td>6,5</td>
<td>22,6</td>
</tr>
<tr>
<td>Palm oil, at oil mill/MY S</td>
<td>kg</td>
<td>75,4</td>
<td>14,6</td>
<td>60,8</td>
</tr>
<tr>
<td>Soybean oil, at oil mill/BR S</td>
<td>kg</td>
<td>74,4</td>
<td>26,6</td>
<td>47,8</td>
</tr>
<tr>
<td>Soybean oil, at oil mill/US S</td>
<td>kg</td>
<td>45,4</td>
<td>6,4</td>
<td>39,0</td>
</tr>
<tr>
<td>Rape oil, at oil mill/RER S</td>
<td>kg</td>
<td>75,9</td>
<td>22,1</td>
<td>53,8</td>
</tr>
</tbody>
</table>
## Product chain in numbers and percentages

<table>
<thead>
<tr>
<th>Description</th>
<th>Energy consumption (MJ/ton flour)</th>
<th>Share of energy consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat flour production</td>
<td>2.092 – 2.194</td>
<td>11 – 12%</td>
</tr>
<tr>
<td>Transport</td>
<td>31</td>
<td>0%</td>
</tr>
<tr>
<td>Collector</td>
<td>77 -79</td>
<td>0%</td>
</tr>
<tr>
<td>Transport</td>
<td>297 – 370</td>
<td>2%</td>
</tr>
<tr>
<td><strong>Milling</strong></td>
<td><strong>361 – 1.186</strong></td>
<td><strong>2 – 7%</strong></td>
</tr>
<tr>
<td>Transport</td>
<td>90 – 92</td>
<td>0 – 1%</td>
</tr>
<tr>
<td>Bakery</td>
<td>5.377 – 8.513</td>
<td>30 – 45%</td>
</tr>
<tr>
<td>Transport</td>
<td>207 – 460</td>
<td>1 – 3%</td>
</tr>
<tr>
<td>Outlet bread</td>
<td>3.105 – 3.693</td>
<td>16 – 21%</td>
</tr>
<tr>
<td>Shopping</td>
<td>1.721</td>
<td>9 – 10%</td>
</tr>
<tr>
<td>Consumer</td>
<td>2.497</td>
<td>13 – 14%</td>
</tr>
</tbody>
</table>
Some calculations

The required energy for the whole product chain is about 19.000 MJ/ton.
For 35 million ton this means
665.000 million MJ = 665 PJ

Ratio:
nutrient content / GER-value = 490 / 665 = 0,737

Rice  0,48
Potatoes  0,71
Energy consumption and costs

- Grain mill: 361-1.186 MJ/ton flour
- Total branch: 12.635 – 41.510 million MJ
- 20% natural gas: 80 – 262 million m3
- 80% electricity: 1.123 – 3.690 million kWh

With € 0,30/m3 and € 0,07/kWh

Annual energy costs, for the whole branch between:
- 103 – 337 million Euro (€ 2,90 - € 9,63/ton flour)
- 0,7 – 2,2 % from your turnover
Agenda

1. Energy from a political point of view

2. Energy saving in the industry
   - Law and regulations (EED)
   - Instruments (Energy Potential Scan)
   - Energy Management (ISO 50001)
Energy from a political point of view

World energy issues

1. Demand and supply of fossil energy in the world
2. Distribution
3. CO2 balance
4. Social disturbance
I. Demand and supply of fossil energy in the world

Global energy stocks 2006.
Percentage sustainable from the total consumption
2. Distribution of energy over the world

Winning

Use

bron: BP Statistical Review
According to our scientists,
We have fossils for one millisecond.

One hour is about 200 million years

The global CO2 emission is about 25,000 million ton per year
4. Social disturbance; supply certainty
Energy saving in the Industry

Brussels, 16 May 2013
Reasons for companies to save energy

- Costs
- Marketing
- Social aspects (corporate social responsibility)
- Law and regulations

What is for your company the main drive to save energy?
Is it a wish, a chance or an obligation?
Law and regulations

motivation or obligation
Energy Efficiency Directive

Article 8

Energy audits and energy management systems

1. Member States shall promote the availability to all final customers of high quality energy audits which are cost-effective and:

(a) carried out in an independent manner by qualified and/or accredited experts according to qualification criteria; or

(b) implemented and supervised by independent authorities under national legislation.
2. Member States shall develop programmes to encourage SMEs to undergo energy audits and the subsequent implementation of the recommendations from these audits.

On the basis of transparent and non-discriminatory criteria and without prejudice to Union State aid law, Member States may set up support schemes for SMEs, including if they have concluded voluntary agreements, to cover costs of an energy audit and of the implementation of highly cost-effective recommendations from the energy audits, if the proposed measures are implemented.

Member States shall bring to the attention of SMEs, including through their respective representative intermediary organisations, concrete examples of how energy management systems could help their businesses. The Commission shall assist Member States by supporting the exchange of best practices in this domain.
4. Member States shall ensure that enterprises that are not SMEs are subject to an energy audit carried out in an independent and cost-effective manner by qualified and/or accredited experts or implemented and supervised by independent authorities under national legislation by 5 December 2015 and at least every four years from the date of the previous energy audit.
Energy Efficiency Directive

6. Enterprises that are not SMEs and that are implementing an energy or environmental management system - certified by an independent body according to the relevant European or International Standards - shall be exempted from the requirements of paragraph 4, provided that Member States ensure that the management system concerned includes an energy audit on the basis of the minimum criteria based on Annex VI.
Minimum criteria for energy audits including those carried out as part of energy management systems

The energy audits referred to in Article 8 shall be based on the following guidelines:

(a) be based on up-to-date, measured, traceable operational data on energy consumption and (for electricity) load profiles;
(b) comprise a detailed review of the energy consumption profile of buildings or groups of buildings, industrial operations or installations, including transportation;
(c) build, whenever possible, on life-cycle cost analysis (LCCA) instead of Simple Payback Periods (SPP) in order to take account of long-term savings, residual values of long-term investments and discount rates;
(d) be proportionate, and sufficiently representative to permit the drawing of a reliable picture of overall energy performance and the reliable identification of the most significant opportunities for improvement.

Energy audits shall allow detailed and validated calculations for the proposed measures so as to provide clear information on potential savings.

The data used in energy audits shall be storable for historical analysis and tracking performance.
Energy saving! Were and hoe to start? Who should be involved? Expert model?

Look to your home situation:
- Insulation
- LED
- HR-boiler
- PV-cells

Were to start with, when you only have € 1.000,=
Effect of the traditional approach is temporary
Energy Potential Scan = a participative energy audit. Consultant working with an EAT)

$$E = Q \times A$$

(Effectiveness = Quality * Acceptance)

- Structured and scheduled
- Energy Action Team
- Commitment of the management
- Total overview of all possibilities (techniques, GHK, organizational)
Energy Experts International B.V.

1. ECA
   - Kick-off

2. Efficiency Scans
   - Production
   - Accommodation
   - Facility
   - Purchasing

3a. Monitoring

3b. Energy Management

4. ESP

Presentation of the result
Gathering energy saving measures

1. Select the most important energy consumers based on your analysis. For every selected consumer

2. Ask the responsible persons to tell the EAT about the process, how it works, how they control it etc.

3. Questions and answers concerning the process deliver an overview of saving opportunities. Besides a list with all kind of saving options.

4. Make a ranking from the options and indicate the investment and saving for each option
Total overview

All energy saving possibilities

Three kinds of measures
Selection and ranking

<table>
<thead>
<tr>
<th>measures</th>
<th>Facilities</th>
<th>Accommodations</th>
<th>Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>technical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>organizational</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good House Keeping</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Energy saving measures in the grain mill

1. Hot water and steam boilers
2. Compressed air
3. Lighting
4. HVAC installations
5. Buildings
6. Electro motors
7. Production
   - Heating water for humidification
   - Use air emissions of cyclones of the mills
   - Optimization flour drying
   - Optimization blower transport
1. Measures: Good House Keeping Boilers

- Inspect and service your boilers and boiler house equipment regularly, at least once per year.
- Trend the efficiency of each of your boilers at least on a monthly basis in relation to the produced steam.
- If you operate multiple boilers in parallel, apply load management to optimise the overall efficiency.
- Ensure a safe and reliable combustion in your boilers with a burner safeguarding system in place that complies with the safety standards.
- Measure the excess $O_2$ in the boiler flue gases and trim the air/fuel ratio to the minimum acceptable excess combustion air amount in order to minimise the stack losses.
- Check and repair where necessary the insulation of boilers and piping and valves.
- Ensure that water treatment of boiler feed water, boiler water and condensate return is up to standard and is functioning properly. Make sure that regular analysing of water samples is being done.
- Check the blow down ratio setting with the boiler water quality.
- Check whether the deaerator works at the required minimum pressure.
- Check the functioning of steam traps.
- Check for steam leakages in the system.
- Regularly check for scaling and fouling in the boilers.
- Regularly check heat exchanger surfaces for scaling and fouling.
1. Measures boilers (steam and hot water)

<table>
<thead>
<tr>
<th>Low-cost / short term opportunities</th>
<th>Action to Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reduce excess combustion air to minimum</td>
<td>1. CO₂/O₂ measurement</td>
</tr>
<tr>
<td>2. Maximise completeness of combustion</td>
<td>2. Soot/CO measurement</td>
</tr>
<tr>
<td>3. Maintain boiler cleanliness (soot/scale)</td>
<td>3. Monitor for rise in flue gas temperature</td>
</tr>
<tr>
<td>5. Insulate feedwater tank and cover tank</td>
<td>5. Check possible feedwater temperature losses</td>
</tr>
<tr>
<td>6. Insulate condensate return lines</td>
<td>6. Check possible heat loss from condensate return lines.</td>
</tr>
<tr>
<td>7. Optimise quality of make-up water and feedwater</td>
<td>7. Monitor quality of make-up water and feedwater: hardness, acidity, O₂.</td>
</tr>
<tr>
<td></td>
<td>8b. Improve blowdown controls</td>
</tr>
</tbody>
</table>
| 9. Maintain nozzles, grates, fuel supply pressure/temperature at manufacturers’ specifications | 9a. Ensure specifications are available and in use.  
| | 9b. Regular check and resetting/maintenance. |
| 10. Maximise combustion air temperature | 10. Draw air from highest point in boilerhouse. |
| 11. Reduce steam pressure where it exceed system/process requirements. | 11. Check system/process needs; adjust controls. |
| 12. Use duct for intake of warmer combustion air | 12. Install duct from combustion air intake to higher parts of room. |
| 13. Install an automated gas leakage detector. | - |
| 14. Repair leaks in steam pipework. | - |
1. Measures boilers (steam and hot water)

<table>
<thead>
<tr>
<th>Energy Saving Opportunity</th>
<th>Action to Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. For rapidly varying demand, convert one or more boilers to</td>
<td>1. Monitor/evaluate demand change patterns.</td>
</tr>
<tr>
<td>live accumulator (buffer tank).</td>
<td></td>
</tr>
<tr>
<td>“Modulating-Low-Off”</td>
<td></td>
</tr>
<tr>
<td>3. Install flash steam heat recovery</td>
<td>3. Consider in large capacity situations with high (continuous/frequent) blowdown.</td>
</tr>
<tr>
<td>4. Improve combustion controls.</td>
<td>4a. Provide adequate heat input to meet demand.</td>
</tr>
<tr>
<td></td>
<td>4b. Minimise fuel/pollution.</td>
</tr>
<tr>
<td></td>
<td>4c. Protect personnel/equipment.</td>
</tr>
<tr>
<td>5. Waste heat recovery</td>
<td>5a. Economizer</td>
</tr>
<tr>
<td></td>
<td>5b. Air heater (recuperator)?</td>
</tr>
<tr>
<td>6. Install boiler blowdown heat recovery.</td>
<td>6. Consider in large capacity situations with high (continuous/frequent) blowdown.</td>
</tr>
<tr>
<td>7. Use process integration</td>
<td>7. Couple process units that have significantly different heat requirements (i.e. low-pressure steam leaving a high-pressure steam consuming production process can be used for a process requiring low-pressure steam).</td>
</tr>
</tbody>
</table>
# 2. Compressed air. Air leakages and costs

<table>
<thead>
<tr>
<th>Hole</th>
<th>Pressure in bar (O)</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,5</td>
<td>0,196</td>
<td>12</td>
<td>15</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>1,0</td>
<td>0,785</td>
<td>45</td>
<td>65</td>
<td>85</td>
<td>105</td>
</tr>
<tr>
<td>2,0</td>
<td>3,140</td>
<td>170</td>
<td>240</td>
<td>310</td>
<td>380</td>
</tr>
<tr>
<td>3,0</td>
<td>7,065</td>
<td>375</td>
<td>520</td>
<td>675</td>
<td>825</td>
</tr>
<tr>
<td>4,0</td>
<td>11,560</td>
<td>700</td>
<td>980</td>
<td>1,250</td>
<td>1,500</td>
</tr>
<tr>
<td>5,0</td>
<td>19,625</td>
<td>1,050</td>
<td>1,500</td>
<td>1,870</td>
<td>2,300</td>
</tr>
<tr>
<td>6,0</td>
<td>28,260</td>
<td>1,520</td>
<td>2,120</td>
<td>2,750</td>
<td>3,350</td>
</tr>
<tr>
<td>7,0</td>
<td>48,240</td>
<td>2,700</td>
<td>3,770</td>
<td>4,800</td>
<td>5,850</td>
</tr>
<tr>
<td>10,0</td>
<td>78,500</td>
<td>3,400</td>
<td>4,700</td>
<td>7,500</td>
<td>9,200</td>
</tr>
</tbody>
</table>

- Hole: \( \phi \) 1 mm
- Hours per year: 8,760 hour
- kWh prize: € 0,05

<table>
<thead>
<tr>
<th>Costs in €/year</th>
<th>4 bar (o)</th>
<th>6 bar (o)</th>
<th>8 bar (o)</th>
<th>10 bar (o)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ltr./min</td>
<td>45</td>
<td>65</td>
<td>85</td>
<td>105</td>
</tr>
<tr>
<td>KWh/year</td>
<td>2,200</td>
<td>3,490</td>
<td>5,200</td>
<td>7,160</td>
</tr>
<tr>
<td>Costs/year [€]</td>
<td>110</td>
<td>175</td>
<td>260</td>
<td>358</td>
</tr>
</tbody>
</table>
## 2. Measures Compressed air

<table>
<thead>
<tr>
<th>Energy Saving Opportunity</th>
<th>Action to Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Switch off whenever possible.</td>
<td></td>
</tr>
<tr>
<td>2. Install low-cost solenoid valves on air supply lines to individual machines. Switch off compressed air supply as soon as machine is switched off.</td>
<td></td>
</tr>
<tr>
<td>3. Clean air intake filters regularly</td>
<td></td>
</tr>
<tr>
<td>4. Use lowest possible operating pressure. Reduce pressure locally if possible.</td>
<td></td>
</tr>
<tr>
<td>5. Use lowest air intake temperature possible.</td>
<td></td>
</tr>
<tr>
<td>6. Fit 2-speed motors.</td>
<td></td>
</tr>
<tr>
<td>7. Fix leaks</td>
<td></td>
</tr>
<tr>
<td>8. Check on correct pressure setting regularly.</td>
<td></td>
</tr>
</tbody>
</table>
## 2. Measures Compressed air

<table>
<thead>
<tr>
<th>Higher cost / longer term opportunities</th>
<th>Action to Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fit a small (jockey) compressor to meet off-peak demand.</td>
<td>-</td>
</tr>
<tr>
<td>2. Duct air intake to ensure coolest possible.</td>
<td>-</td>
</tr>
<tr>
<td>3. Fit air flow and kWh meters to monitor power and air use.</td>
<td>-</td>
</tr>
<tr>
<td>4. Install modern controls on multi-compressor installations.</td>
<td>-</td>
</tr>
<tr>
<td>5. Fit a standard heat recovery unit.</td>
<td>-</td>
</tr>
<tr>
<td>6. Air pre-cooling.</td>
<td>-</td>
</tr>
<tr>
<td>7. If some users are using low pressure air (2.5 - 3 bar), install two separate systems.</td>
<td>-</td>
</tr>
<tr>
<td>8. Use frequency control for compressor.</td>
<td>-</td>
</tr>
<tr>
<td>9. Use an individual compressed air supply for special applications.</td>
<td>-</td>
</tr>
<tr>
<td>10. Replace pneumatic tools be electrical tools</td>
<td>-</td>
</tr>
</tbody>
</table>
3. Measures lighting

<table>
<thead>
<tr>
<th>Energy Saving Opportunity</th>
<th>Action to Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Use the most efficient lamps consistent with required illumination levels and colour rendering.</td>
<td>-</td>
</tr>
<tr>
<td>2. Use the light output from lamps efficiently.</td>
<td>-</td>
</tr>
<tr>
<td>3. Maintain lamps and fixtures clear of light-blocking dust and dirt.</td>
<td>-</td>
</tr>
<tr>
<td>4. Switch off lights where lighting is not needed.</td>
<td>-</td>
</tr>
<tr>
<td>5. Consider automatic control of lighting (time clocks and/or photo cells).</td>
<td>-</td>
</tr>
<tr>
<td>6. Make the best use of daylight.</td>
<td>-</td>
</tr>
<tr>
<td>7. Avoid the absorption of light by the surroundings (light-coloured wall, ceilings, and floors).</td>
<td>-</td>
</tr>
<tr>
<td>8. Replace lamps which have exceeded their rated life.</td>
<td>-</td>
</tr>
<tr>
<td>9. Use “switch-off” and “save-it” stickers as a tool of good housekeeping.</td>
<td>-</td>
</tr>
<tr>
<td>10. Consider new technologies in order to reduce installation cost, such as infrared switching.</td>
<td>-</td>
</tr>
<tr>
<td>11. Divide the lighting system of a large space into several independent lighting groups.</td>
<td>-</td>
</tr>
<tr>
<td>12. Use presence detection switches</td>
<td>-</td>
</tr>
<tr>
<td>13. Use a lighting system that is continuously variable (e.g. high-frequency fluorescent lighting).</td>
<td>-</td>
</tr>
</tbody>
</table>
4. Measures Good House Keeping HVAC

- Ensure regular inspection and servicing of heaters/boilers and air conditioning equipment
- Ensure that air fans, and air ducts are cleaned and filters are replaced regularly.
- Ensure that evaporators and condensers of air conditioning units are clean and well maintained
- Determine minimum heating requirements for individual areas in buildings and ensure that room thermostats work with the correct set points for climate control (heating, cooling, humidifying)
- Ensure timers of thermostats are working, and on the correct setting
- Where appropriate consider installation of thermostat valves on radiators
- Consider energy conservation measure such as insulation, and outside sunlight shading
- Shut off unnecessary heating elements
- Repair broken windows
- Ensure boiler controls are working, and at the correct settings
- Remove any obstructions in front of radiators or heaters
- Avoid heaters and air conditioning units operating simultaneously in the same space
- Check whether there are complains about room temperatures (too high when heated, too cold when air conditioning on)
- Check whether there portable electric heaters in use
- Check how hot water is being provided
- Check if windows and doors are closed when heating or air conditioning is on
- Check for any cold draughts coming from windows or doors
5. Measures buildings

Energy savings can be achieved in two ways:

- reducing the heating/cooling needs by:
  - building insulation
  - efficient glazing
  - air infiltration reduction
  - automatic closure of doors
  - destratification
  - lower temperature settings during non-production periods (programmable regulation)
  - reducing set point
  - improving the efficiency of heating systems through:
    - recovery or use of waste heat (see Section 3.3)
    - heat pumps
  - radiative and local heating systems coupled with reduced temperatures in the unoccupied areas of the buildings.
6. EU legislation electromotors

- **IE4**: Super Premium efficiency
- **IE3**: Premium efficiency
- **IE2**: Hoge efficiency
- **IE1**: Standaard efficiency

**Efficiency Levels**
- **EFF 1**: 1 jan. 2017 > 0.75 kW
- **EFF 2**: 16 juni 2011
- **Nieuwe wereldwijde IEC60034-30 standaard**
Energy Management

Deming circle

1. Energy Policy

2. Plan

3. Do

4. Act

5. Check

Secured by means of a management system

Continual improvement

Deming’s Circle

Time

Performance
Energy Management (ISO 50001)

Continual improvement

- Energy policy
- Energy planning
- Implementation and operation

Management review

Checking

- Internal audit of the EnMS
- Monitoring, measurement and analysis
- Nonconformities, correction, corrective and preventive action
Conclusions and recommendations

– **Energy consumption mills** 2-7 % (from the whole chain)

– **Energy costs mills** € 103 – 337 million Euro (€ 2,90 - € 9,63/ton flour; 0,7 – 2,2 % from your turnover)

– **Energy Efficiency Directive (EED):** obligation to Audits and/or Energy Management (ISO 50001)

– **Companies with energy costs > € 250.000,=:**
  1. Energy Potential Scan
  2. Implementation Energy Management

– **Companies with energy costs < € 250.000,=:**
  1. Develop a standard audit on EU level and integrate the experiences/measures from the EPS
  2. use benchmarking for stimulating
Conclusions and recommendations

– **Saving possibilities**: generic lists for utilities and buildings are available. For production you need your employees with a consultant (EPS).

– Perhaps that some generic “energy” themes can be initiated from the EU flour millers level and made available for all EU flour mill companies (on the website) f.i.
  - Audit format;
  - Best practices;
  - Measure lists;
  - Performance indicators
Thank you for your attention

Questions?