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Benchmarking and Energy Management Schemes in SMEs (BESS)

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- Introduction
- Goals, activities & organization
- Tools
- Pilot Results
- Follow up

- In past focus on large energy intensive companies
- Energy efficiency in the “forgotten group” of SMEs
- Reluctance in SMEs to focus on energy management and to invest in energy efficiency measures
- Resources in SMEs are limited and information about opportunities and possibilities & tools are scattered .
- Idea of BESS: SMEs can benefit from a European approach and sector information on EE possibilities
- Pillars of BESS:
 - a) Benchmarking possibilities to trigger companies
 - b) implementation of energy management to secure continuous attention for energy improvements.



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Goals

- Develop energy management and energy benchmark applications for SMEs
- Insuring continued attention of energy efficiency and energy management to SMEs
- reduced production costs and reduced energy intensity in SMEs



Activities

1. Tool development
2. Pilot SME recruitment
3. Tool testing and adjustment
4. Dissemination

Organization

European cooperation of:

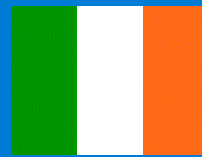
- SME companies,
- Energy Agencies and
- Industrial associations from:



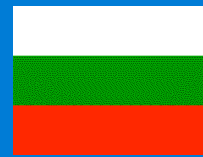
Finland



Austria



Ireland



Bulgaria



Lithuania



Netherlands



Norway



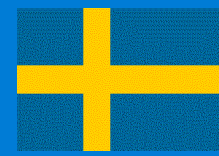
Greece



Slovenia



Spain



Sweden



Europe



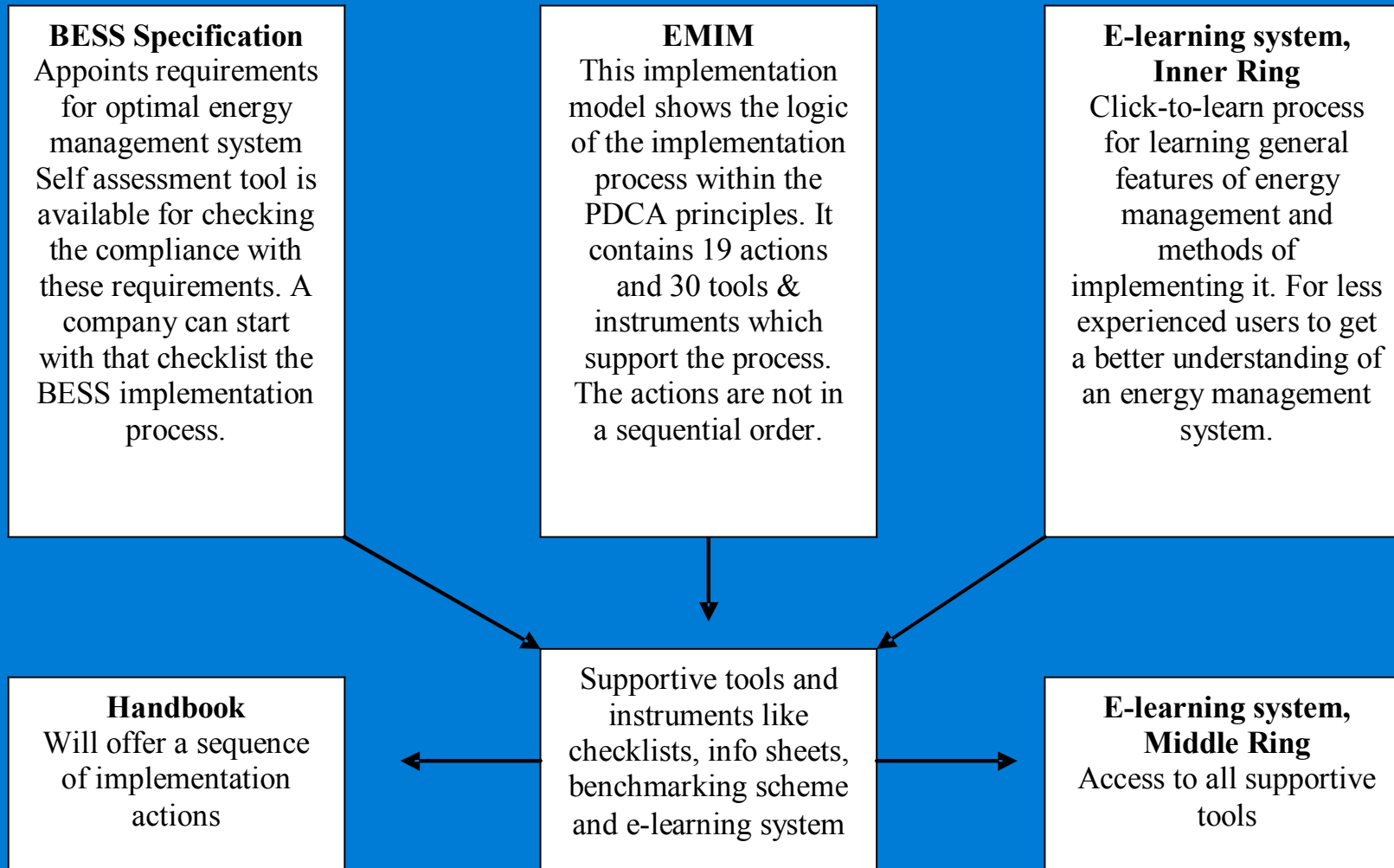
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Overview BESS tools





Energy Management Implementation Model and how to implement

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Basics			Definitions	Specifications		
Start			Business Case 1	Pre-Self Assessment 1	Energy Management Implementation Project Plan 1	
Understand	Plan	A	Energy audit 4	Analysis Tools 4	Legislative & Regulative Framework 4	
Plan	Plan	B	Energy Action Plan 5	Roles & responsibilities 1+5		
Commit	Do	C	Energy Coordinator 2	Energy Team 2	Energy Policy 3	
Implement	Do	D	Implement Energy Action Plan 6	Operation & Maintenance 6		
Evaluate	Check	E	Indicators 7	Monitoring & Targeting 7	Benchmarking 8	Energy Management Checklist 8
Review	Act	F	Revision 9	Improve 9		

First create a common understanding (a)

- Set of definitions
- The BESS EnergyManagement Specification

BESS Energy Management Specification <i>(italic/blue requirements are desirable)</i>	Explanatory notes (adopted from the EIE EMS-Textile project)
<p>1 Energy Policy</p> <p><i>1.1 Energy policy statement</i></p> <p><i>1.1.1 The organization has specifically included energy as an <u>important</u> aspect of its (environmental) policy. The energy policy is appropriate to the environmental impact of the operations.</i></p> <p><i>1.1.2 The organization has explicitly defined that legislation and regulations, - and if <u>applicable</u> - any LTA or the energy aspects of an environmental covenant will be complied with.</i></p> <p><i>1.1.3 The organization has defined its <u>commitment</u> to continual improvement of the energy efficiency and prevention of unnecessary energy consumption.</i></p> <p><i>1.1.4 The energy policy has been communicated to all employees</i></p> <p><i>1.1.5 The energy policy is available to the public</i></p>	<p>Top management of the organization should establish and maintain the energy policy of the organization. The energy policy expresses the organization's <u>commitment</u> to energy efficiency and respective continuous improvement. Top management ensures that the energy policy:</p> <ul style="list-style-type: none"> ☞ is appropriate to the nature, scale and energy consumption of the organisation's activities, products and services ☞ includes a <u>commitment</u> to continual improvement in energy performance and abatement of unnecessary energy consumption ☞ includes a <u>commitment</u> to comply with the legislation and the regulations related with energy and with other requirements to which the organisation subscribes ☞ provides the framework for setting and reviewing energy performance objectives and targets ☞ is documented, implemented, maintained and communicated to members of the <u>organisation</u> ☞ is available to the public



First create

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a common understanding (b)

- BESS Energy Management Checklist
- Pre-self assessment checklist

Print		Company			Supported by
		Print:			Intelligent Energy Europe
		Filled out by:			
		Seen by management:			
<u>Energy Management Checklist</u>		<p>Number of "Priority 1" questions: 19 Number of "Priority 2" questions: 7 Number of "Optional": 14</p>		<p>If you want to enter another line in the Comments field, type "Alt Return".</p>	
Results:		This is a blank Energy Management Checklist.		This is a blank Energy Management Checklist.	
<p><i>Energy aspect= everything that results in the consumption of energy. Anything that has a positive or negative effect on the energy consumed by the operational activities is an energy aspect. Think in this respect of technology (e.g. equipment and starting up), organization (such as work processes and maintenance) and behaviour (e.g. compliance with job instructions).</i></p>					
A Basic information				Comments	Explanation of the question
1	Are the energy consumption figures known and available (e.g. in the ECP or from your monitoring information)?	<input type="checkbox"/> Yes	Priority 1		You are expected to have access to a summary (Energy Consumption Analysis) of the processes, buildings and utilities with energy consumption data, for example per product line or per sub-process.

Getting started and organize internal management

- Business case
- Pre-self assessment checklist
- Template of company commitment
- Description of the roles and responsibilities
- Template for organizing an energy management team

BESS - Benchmarking and Energy management Schemes in SMEs

Tasks, Responsibilities and Authorization (TRA) Matrix

The TRA matrix is a list of tasks, responsibilities and authority to clearly identify which individuals in the organization are directly a for a properly-functioning en what and who bears responsibility

Everyone involved in an ener bears responsibility

Everyone involved in an ener bears responsibility, but esp management with a clear task In compiling the TRA matrix, energy consumption? Every in in the TRA matrix.

Ultimate responsibility for the

Tasks, responsibilities and authorization Energy Coordinator			
Task	Responsible for	Actions	Authorization
Work plan	Translating the Plan of Action into a yearly Energy Plan	Compile energy work plan each year, including time	Call for cooperation needed to
Energy scans	Organ energy in ord update		
Tasks other individuals in energy managem			
Position	Task	R	
<i>Managing director</i>	Energy management programme	A	ol



MANAGEMENT
 COMMITMENT

Execute/Update an energy audit

- Energy audit description
- Energy audit data collection sheet
- Measure lists and good housekeeping
(in BESS 3 pilot sectors: dairies, bakeries and meat processing)

BESS - Benchmarking and Energy management Schemes



Energy auditing

To identify energy savings opportunities, to conduct an energy audit, to collect data on energy use and equivalent CO₂ emissions, to provide recommendations for energy savings. An energy audit can vary a lot in scope and depth associated with a specific organisation's current energy management system.

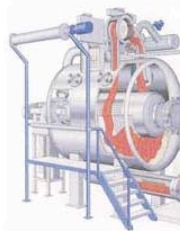
The work undertaken includes:

- investigating the energy consumption of the equipment within the organisation
- identifying the energy saving opportunities and its percentage against the current energy consumption
- identifying cost-effective energy saving measures

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ENERGY AUDIT DATA COLLECTION SHEETS




Measure List Dairy

Process-related Improvement Opportunities

Fluid Milk Processing

Process Area	Operating Low Cost/No Cost	Retrofit Higher Cost
1. Raw Milk Receiving and Tanker Wash (Raw Area)	1. Nozzle maintenance for CIP to ensure minimal hot CIP use	1. Infrared heating for receiving bay. 2. Exterior Tanker Wash with recycled water from elsewhere in plant. 3. CIP system improvements
2. Raw Milk Holding Silos (Raw Area)	1. Enhance silo insulation. Ensure	

By Courtesy of the EMS-Textile Project



ENERGY ACTION PLAN



Energy Action Plan & Energy savings register

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EIE/04/246/S07.38678

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BESS Template for an Energy Action Plan & Energy Savings Register

Introduction

An essential part of the energy management system in the company is the Energy Action Plan. It is part of the PLAN phase within the cycle for continuous improvement of energy efficiency.

The Action Plan documents:

- the commitment of your company to carry out current and future actions (for the duration of the plan e.g the coming 4 or more years) for further steps to implement energy management and actions to be taken to increase energy efficiency of the company.
- an overview of the current status of the Planning and the Implementation of the actions so far (the energy savings register part contain the achievements)

The energy action Plan contains the following items:

- the commitment and ambitions related to the energy policy of your company
- the energy (specific) consumption figures of your company in the reference year*

Planned actions and status 2006-2010

Overview of planned actions and their contribution to the Energie Efficiency Index-improvement

electricity consumption in the reference year ----- (kWh)	1000000
natural gas consumption in the reference year -----(m ³)	1000000
Primary energy use in the reference year --- (GJ)	40650

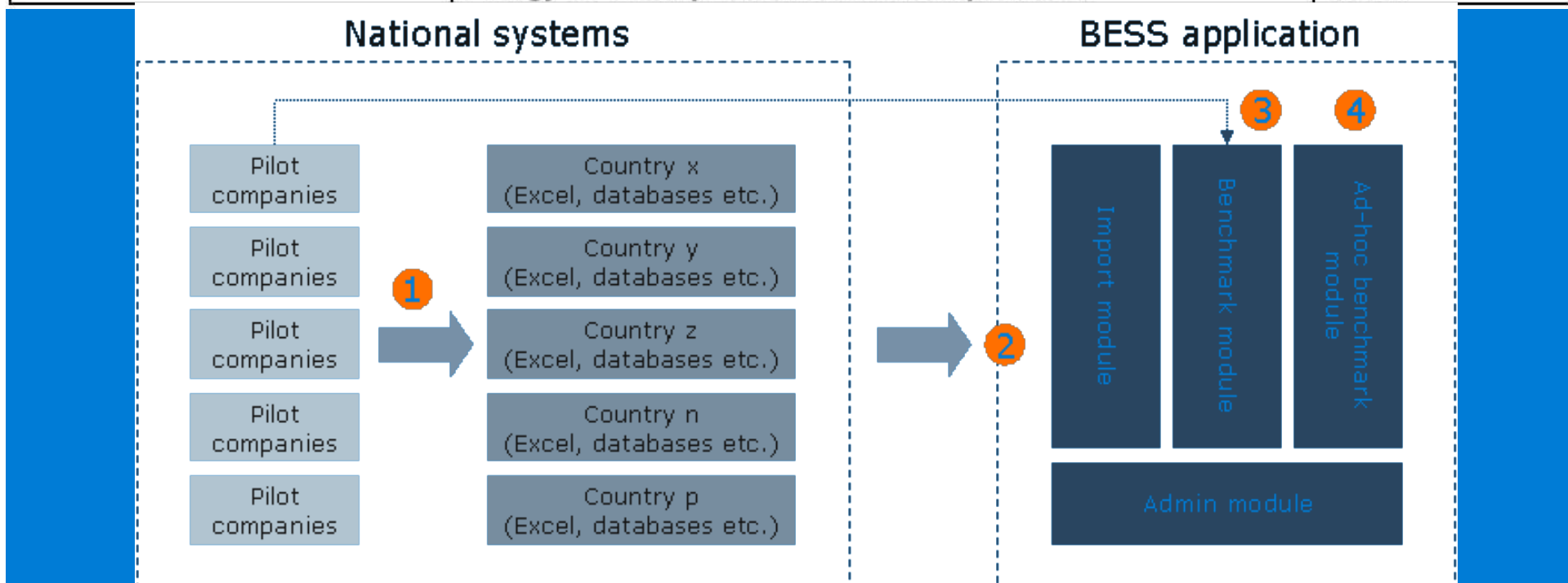
Energy saving measure ¹ (number and description)	year of execution of the action	planned year measure in use	status 2006	s	s	s	investm needed staff &	pay back period yrs	savings in kWh per year
Energy Management & good housekeeping									
1)									
2)									
etc)									
Energy saving projects in processes									
Energy saving projects in utilities & buildings									
Strategic projects									
Total energy efficiency									0

PLAN → DO → CHECK → ACT : - Monitoring & Targeting

- Review and Corrective Actions 15

Benchmarking (a) system

Level	Indicator	Unit
Level 1: Company	Total energy consumption/ton produced	kJ/ton
	Total electricity consumption/ton produced	kWh/ton
	Quality level on Energy Management Checklist	%
Level 2: Process/product	Process related energy/quantity produced	kJ/quantity
	Non-product depending energy use/square meter heated	kJ/m ²
Level 3: Equipment	Electricity for compressed air applications/ton produced	kWh/ton
	Energy for steam production/ton steam produced	kJ/ton





Benchmarking (b) SEC

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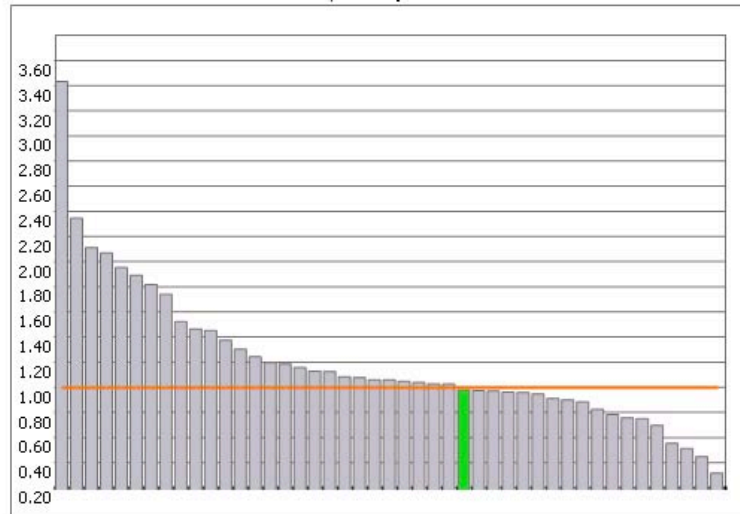
BESS | European Energy Benchmarking

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Introduction **Specific Energy Consumption** % Improvement Historical progress Qualitative score

Select year for benchmarking 2005

kWh/milk equivalents



■ Your company: 0.98
■ Other companies in industry, Best value: 0.32
■ Arithmetic average value: 1

Industry **Dairy industry**

Countries included in benchmark

- Netherlands Ireland
- Greece Spain
- Norway Sweden
- Finland Austria
- Lithuania Bulgaria
- Slovenia

Energy report unit:

- kJ
- kWh

Adjustment factors

- Production mix with equivalents
- Boiler efficiency
- Utilization of capacity
- Climatic corrigitations

Update benchmark

Notes:

This benchmarking result can be influenced by several country and production specific circumstances. Companies taking part in the benchmarking are in the optimum position to interpret their results best and to identify key opportunities to improve their own energy efficiency



Benchmarking (c) historical progress

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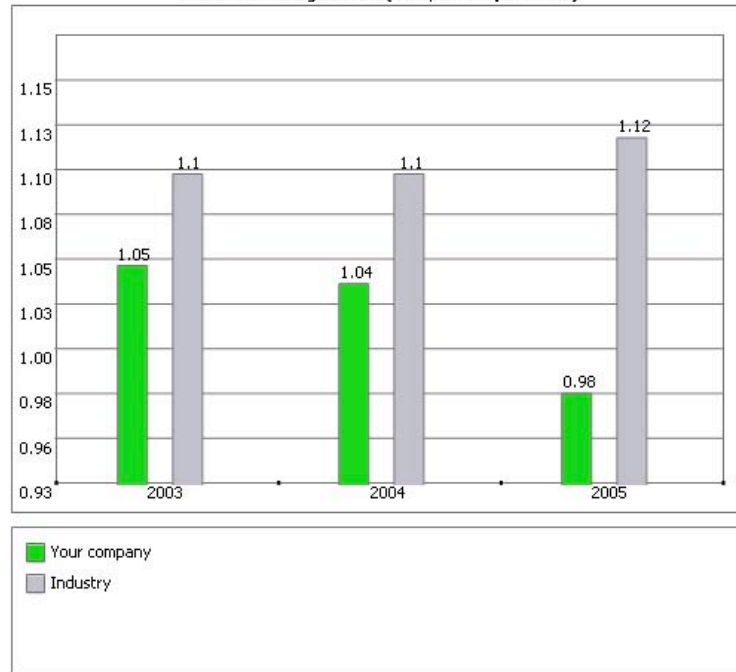


BESS | European Energy Benchmarking

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Introduction Specific Energy Consumption % Improvement **Historical progress** Qualitative score

Historical change in SEC (kWh/milk equivalents)



Industry **Dairy industry**

Countries included in benchmark

- Netherlands
- Ireland
- Greece
- Spain
- Norway
- Sweden
- Finland
- Austria
- Lithuania
- Bulgaria
- Slovenia

Energy report unit:

- kJ
- kWh

Adjustment factors:

- Production mix with equivalents
- Boiler efficiency
- Utilization of capacity
- Climatic corrigitons

Update benchmark

Note:

This benchmarking result can be influenced by several country and production specific circumstances. Companies taking part in the benchmarking are in the optimum position to interpret their results best and to identify key opportunities to improve their own energy efficiency



Benchmarking (d)

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quality of energy management system



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Introduction

Specific Energy Consumption

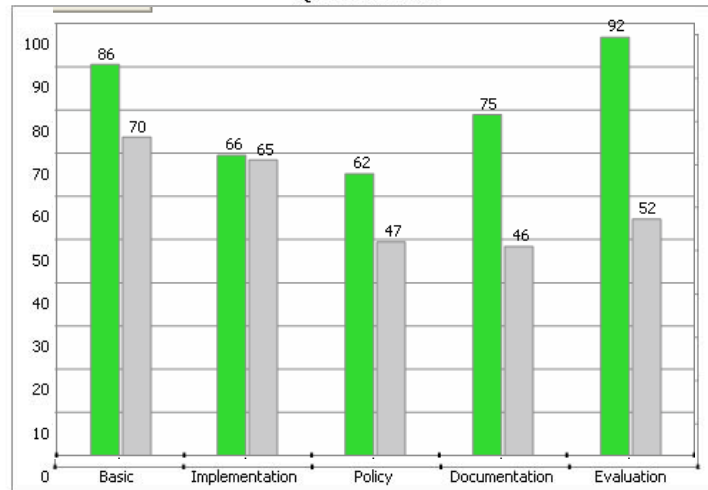
% Improvement

Historical progress

Qualitative score

Select year for benchmarking 2005

Qualitative score



Your company
 Industry

Industry Dairy industry

Countries included in benchmark

- Netherlands
- Ireland
- Greece
- Spain
- Norway
- Sweden
- Finland
- Austria
- Lithuania
- Bulgaria
- Slovenia

Energy report unit:

- kJ
- kWh

Adjustment factors

- Production mix with equivalents
- Boiler efficiency
- Utilization of capacity
- Climatic corrigitations

Update benchmark

Note:

This benchmarking result can be influenced by several country and production specific circumstances. Companies taking part in the benchmarking are in the optimum position to interpret their results best and to identify key opportunities to improve their own energy efficiency



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Benchmarking and Energy management Schemes in SMEs



the BESS project

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- Are you a dairy, meat or bakery company or association?
- Would you like to improve your energy efficiency and thus your profit?
- Are you interested in evaluating your energy efficiency score in comparison with other European colleagues?
- Do you want to learn more about energy management?
- Do you want to see some case studies of your colleagues?

Then [click here!!](#).....or [contact us](#) for further information



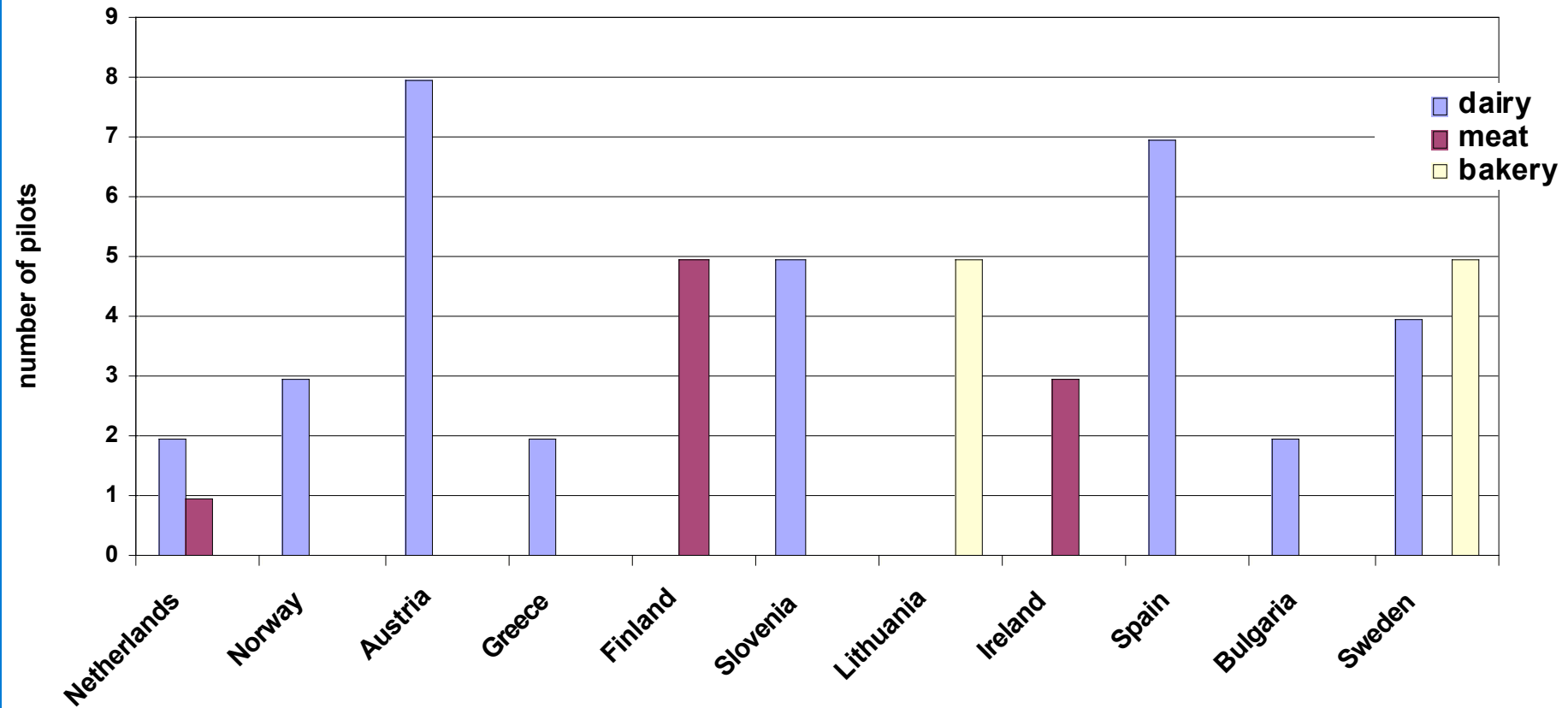


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Pilot Companies





Summary of results)

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- Feed back on tools from more than 50 companies
- Analyses of economic and energy data of BESS pilot companies shows the results of energy management: Profit increase by 3 – 10%. In one case even by 250%!
- Associations helpful sometimes even crucial
- Personal contact between the initiator/facilitator of EE activities (e.g agency or consultant) and the companies !
- Commitment of the highest manager in the company !
- Lack of time and insufficient human resources (consultant and subsidised energy audit can be helpful)
- Benchmarking is the main trigger for many companies to consider their energy management



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Follow Up

- Pilot shows BESS approach is successful
- Continuation/outreach via IEE ExBESS and BESS follow up with existing and other interested parties
- (Ex)BESS continues cooperation with national energy agencies, and industrial sector associations
- Coordination with relevant EIE projects like EMS Textile, E-Check in Craft, Optipolygen, RECIPE (Plastics) etc.
- For more information and cooperation regarding BESS
- Contact the authors and www.bess-project.info and bess@senternovem.nl