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Energiemanagement



How can we facilitate the introduction of Energy Management Systems?

Jonas Mey @eceee summer study 2011

About Me

- born 1970, married, one son (2y.)
- Engineer for Energy & Processing Technology
- 2 ½ years project engineering (GEA AG)
- 2 years consultant for Berlin Energy Agency
- own company since 2005
  - Consultancy to enterprises, many SME
  - Studies, material and publications for Greenpeace, Friends of the Earth (BUND) and German Energy Agency (dena)
- Since 2010 new company name: Abado GmbH

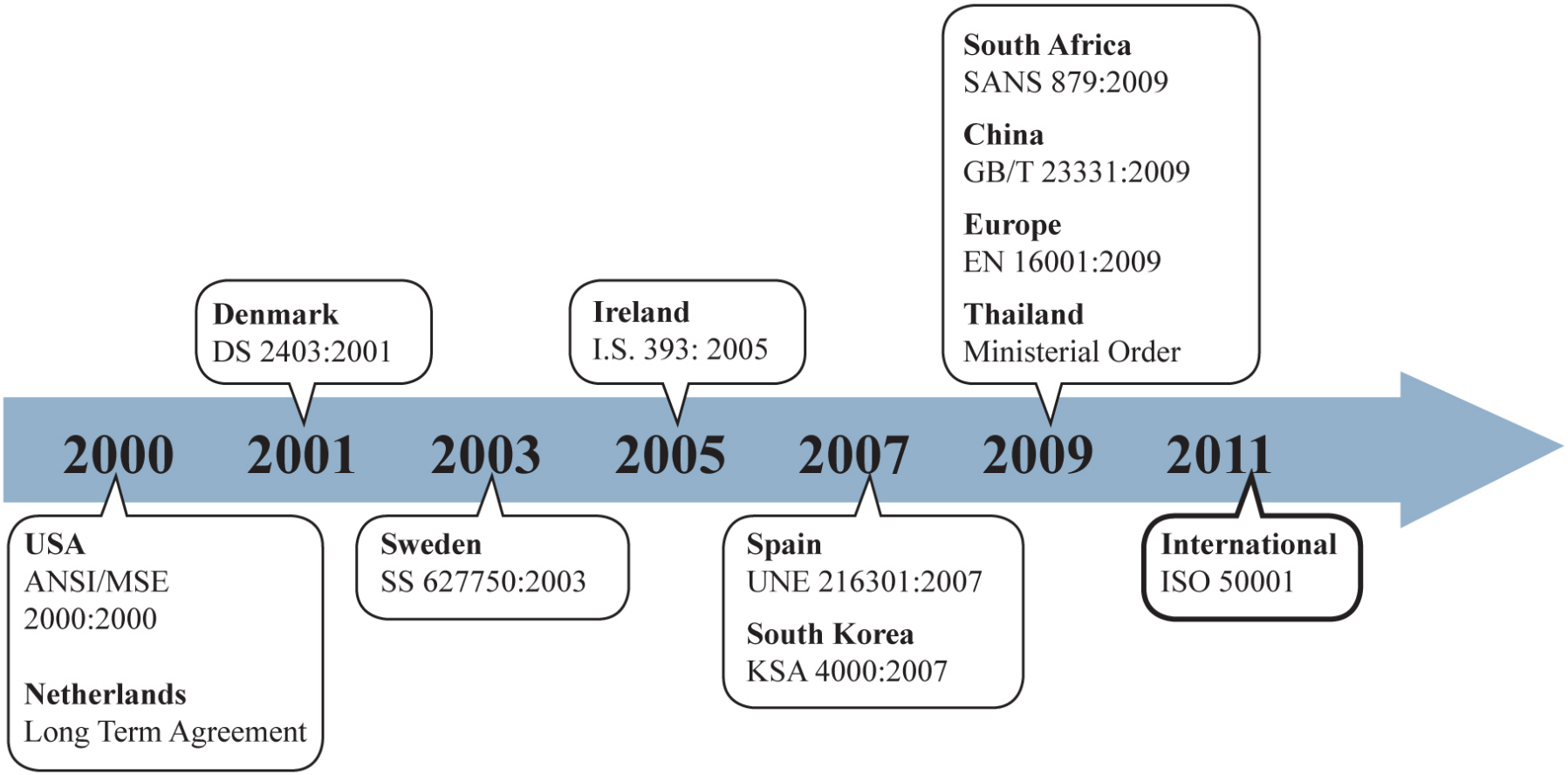
Objectives of this presentation

- Speed up introduction of Energy Management Systems in Industry
  - Analyze obstacles
  - Discuss means of support
  - Discuss the right scope for an EnMS (minimum requirements?)
- Present our approach (methodology and software)
- Find ways to cooperate on a European level

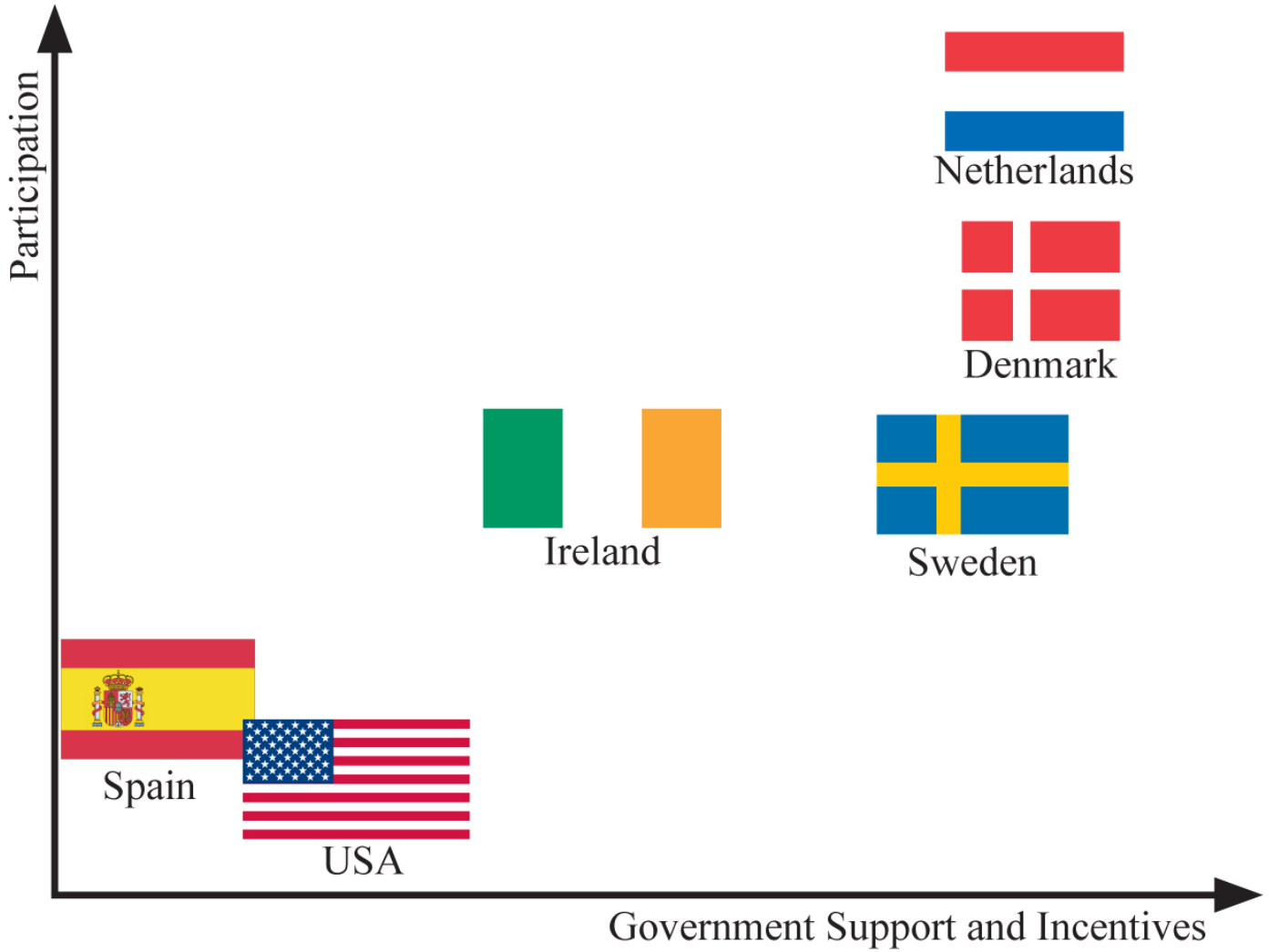
Obstacles to widespread introduction of Energy Management Systems

- Lack of information
  - about benefits
  - about what it is
  - about how to…?
- High Costs
  - compared to (assumed) possible savings
  - excessive requirements (?)
  - lack of tools and help

International Experience: Introduction of standards and policies



International experience: Government support and success of EnMS schemes

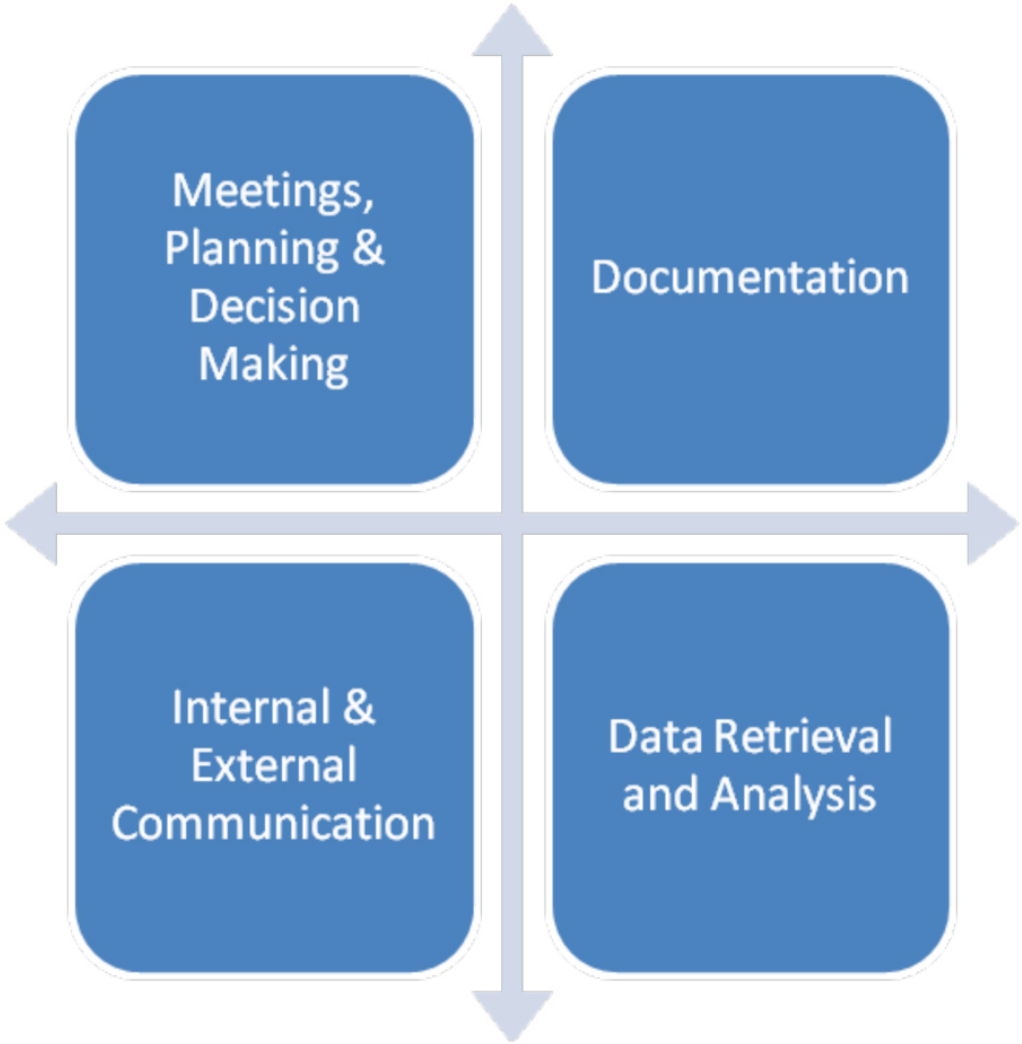


What is the right scope?

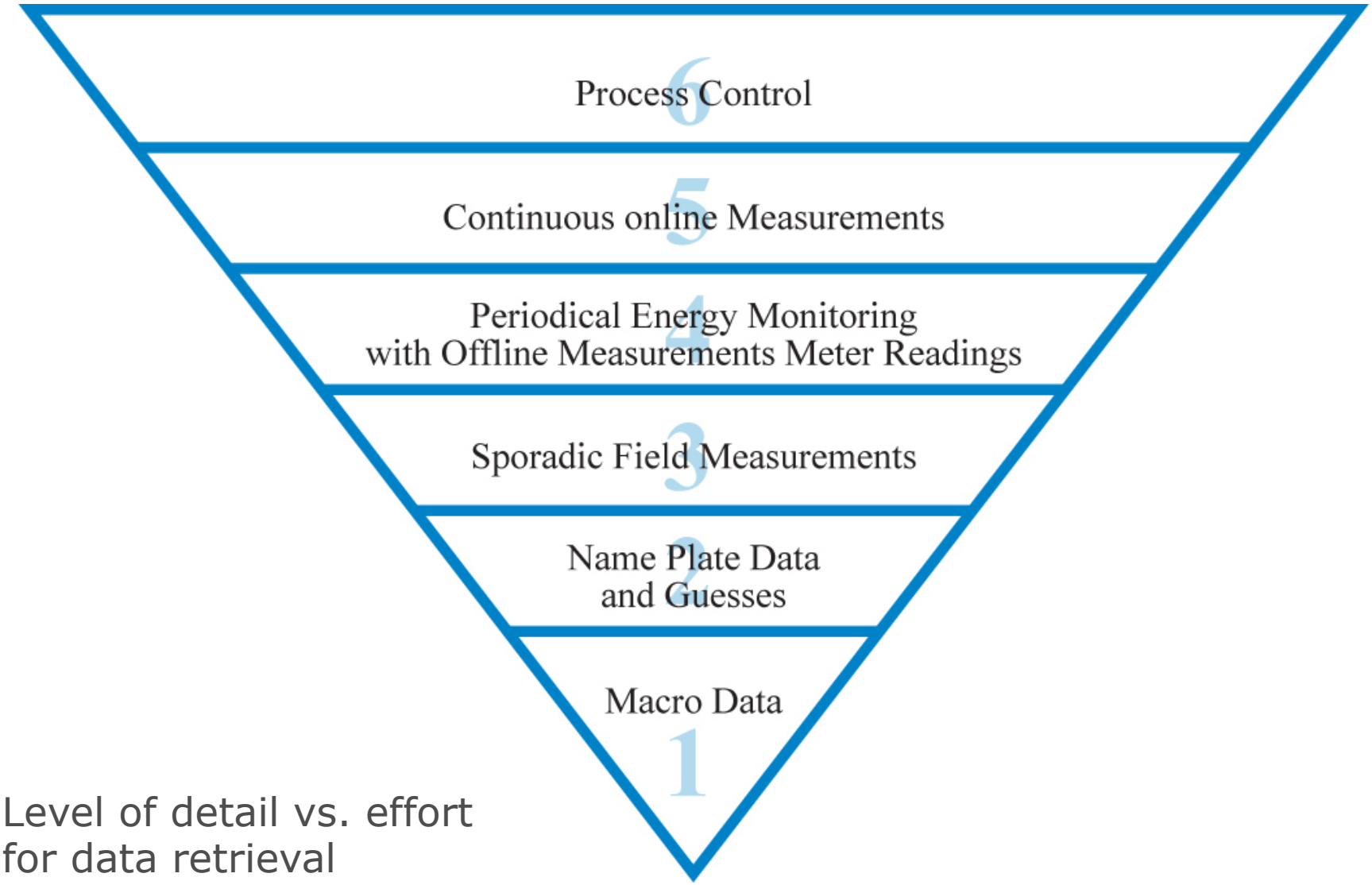
- How to set the minimum requirements for an EnMS when there are (tax) incentives?
- Low requirements: Companies may establish an EnMS "pro-forma" and not live it, just to get the benefits ("**Mitnahmeeffekte**" ~ freerider effects, windfall gains)
- High requirements: Some companies may be deterred, others may be forced into **inefficient allocation of resources**

Requirements of an EnMS

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Effort of energy data retrieval & analysis



Level of detail vs. effort
for data retrieval

The right scope: Example calculation

Medium sized company (small factory)		
Energy costs	1 000 000	€/year
Investment 1st year:		
Human resources: 1 person half time, others sporadically	50 000	€
New submetering systems: 20 meters + software	20 000	€
Implementation of efficiency measures	150 000	€
Sum of initial investment	**220 000**	**€**
Annual return		
Assumed savings by EnMS: 10% after 1st year?	100 000	€/year
Human resources	-30 000	€/year
Maintenance and licensing of submetering system (20%)	-4 000	€/year
Net return before pay-back of investments:	**66 000**	€/year
Further efficiency action	?	€/year

The right scope: Conclusion

- In previous example (1 000 000 € energy cost p.a.) the ROI of EnMS is just acceptable
- In smaller company (e.g. 100 000 € energy cost p.a.) assumed savings of 10% (=10 000 €/year) do not pay for human resources to analyze data continuously and perform extensive documentation
- The first company may have an annual turn-over of 20 Mio €

  (@ energy costs = 5% of turn-over)

  "SME": <50 Mio €/year

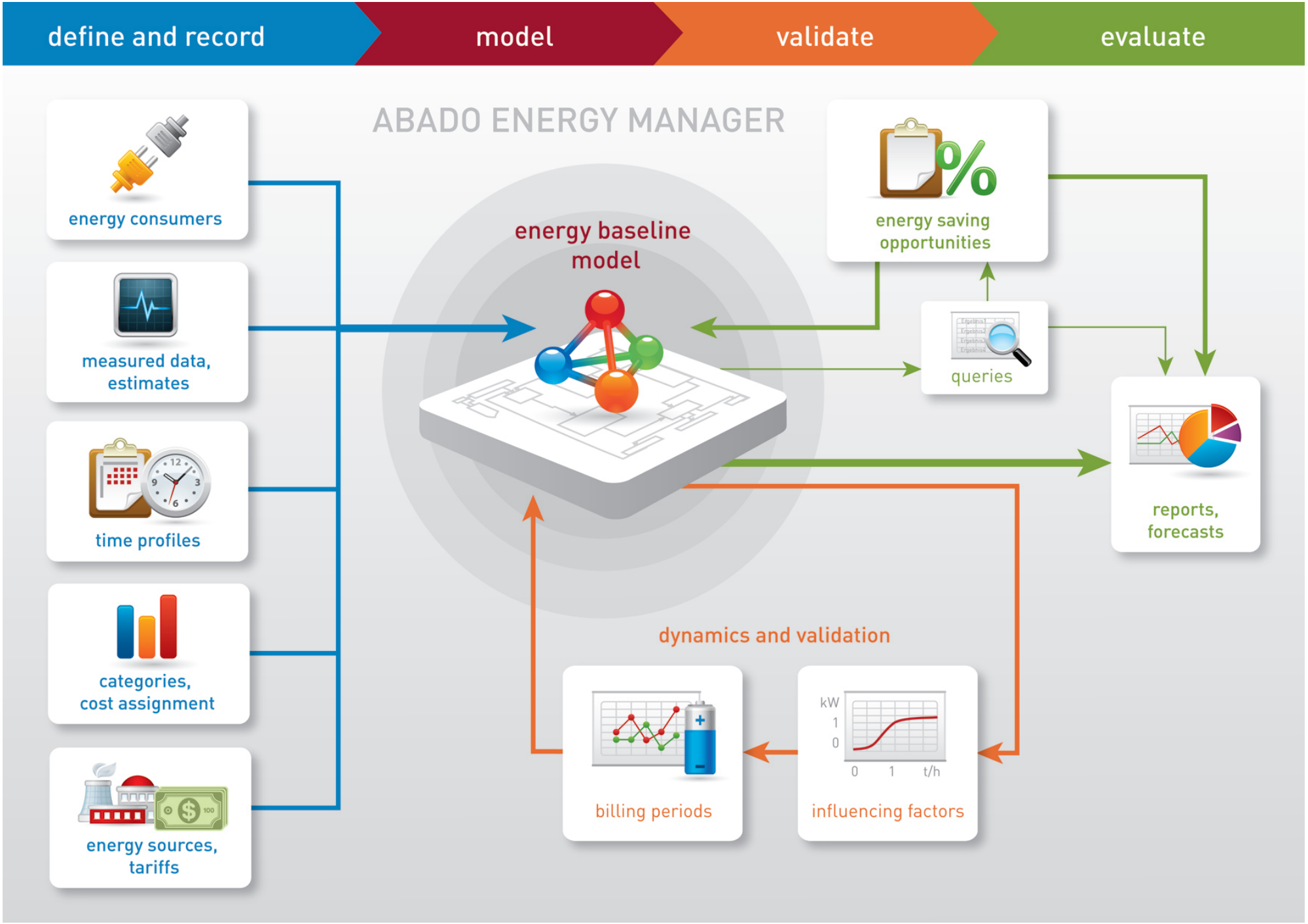
- **Conclusion: There should be less demanding requirements for smaller or less energy intensive companies**

Our approach

- Detailed understanding of energy situation is important!
- Continuous energy controlling (online submetering) may be to costly
- Energy Model of company + simple energy bookkeeping rather than large submetering system
- Make use of field measurements and offline submeters
- Compare model data to measured data periodically

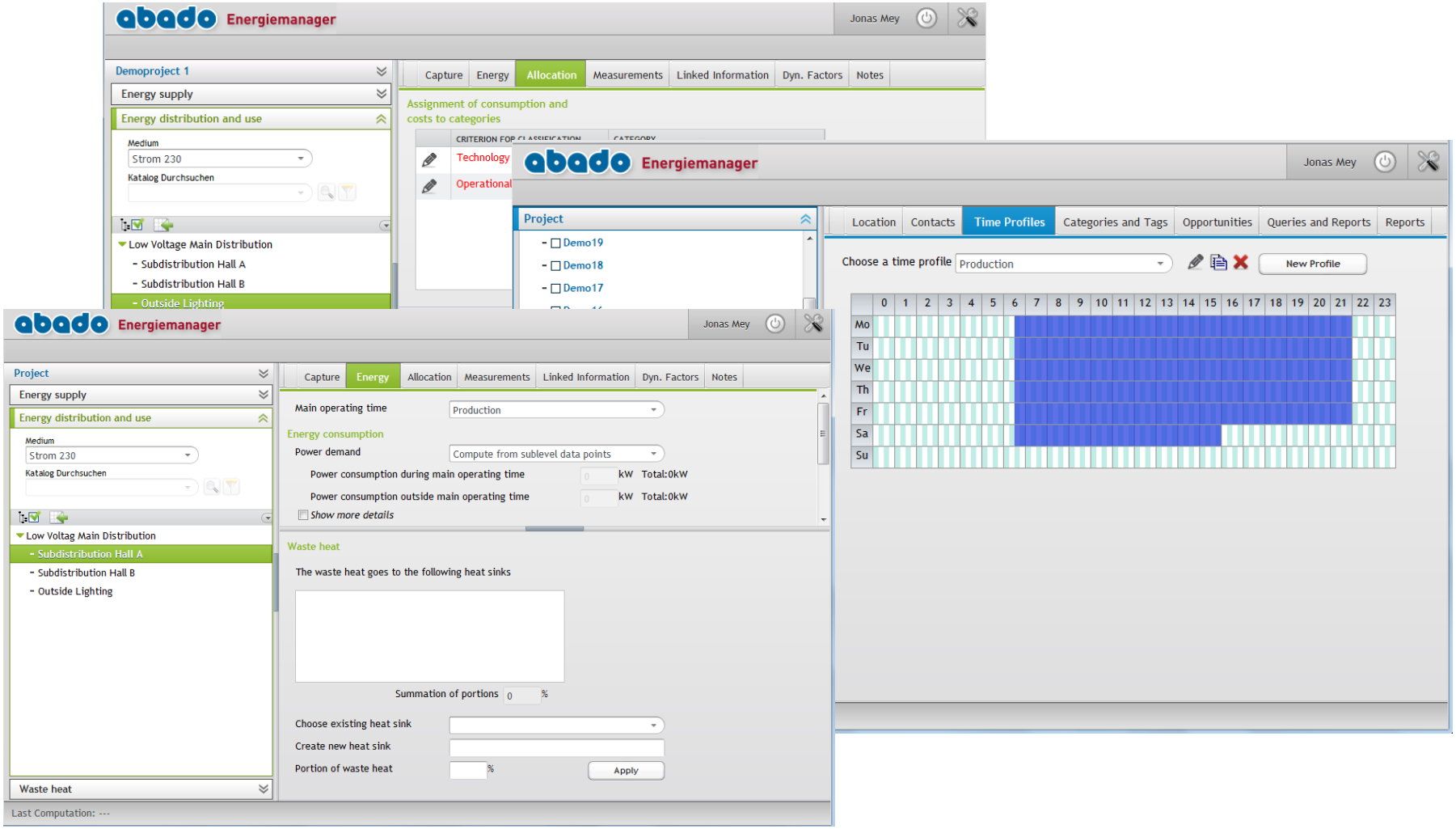
Energy Model

- **Consumption** = Average Demand * Operating hours
  (= Installed Power * Utilization Factor * Operating hours)
- **Cost** = Consumption * Price
- Dynamically: Energy Consumption = Standard Consumption * **Adjustment Factor**
- **Energy Management Opportunity** (possible saving for specific measure) = Annual Cost * Relative Saving (%)



Online Tool: Workflow

Screenshots



Output / Benefits

- Reports
- Scenarios
  - Comparison ex ante / ex post
- Collection of ideas and opportunities
  - Automatic recalculation under changed conditions
- Energy management baseline
  - Adjustment to standard conditions
- Key Performance Indicators
  - Adjusted to standard conditions
  - More specific, more microscopic

Call for cooperation

- EnMS standards are European / Global; Companies are global

  → Management tool should be available on a European level / globally, too
- Internet based tool can be used for binding target group and for dissemminating information
  - (e.g. info on BAT at point-of-use)
- Could be used in EU-Project
- Multi-language capability is already installed



Thank you!

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Questions for discussion

- How demanding should EnMS support programmes be?
- Should continuous sub-metering be mandatory?
- Must data be automatically processed?
- What should be the requirement for the management of documents?
- Should there be separate requirements for SME?
- Should introduction of EnMS be supported financially, by capacity building, by (free/low cost) information material and tools, be obligatory or all/none of the above?
- How could we develop a support scheme together?