Ecodesign
From products to systems

eceee
Swedish Energy Agency
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With support from Energifonden

Energy savings in product systems

Examples – EU Potentials

Nils Borg, Executive Director, eceee
Ecodesign seminar "From products to systems"
Brussels, 4 February 2014

About eceee

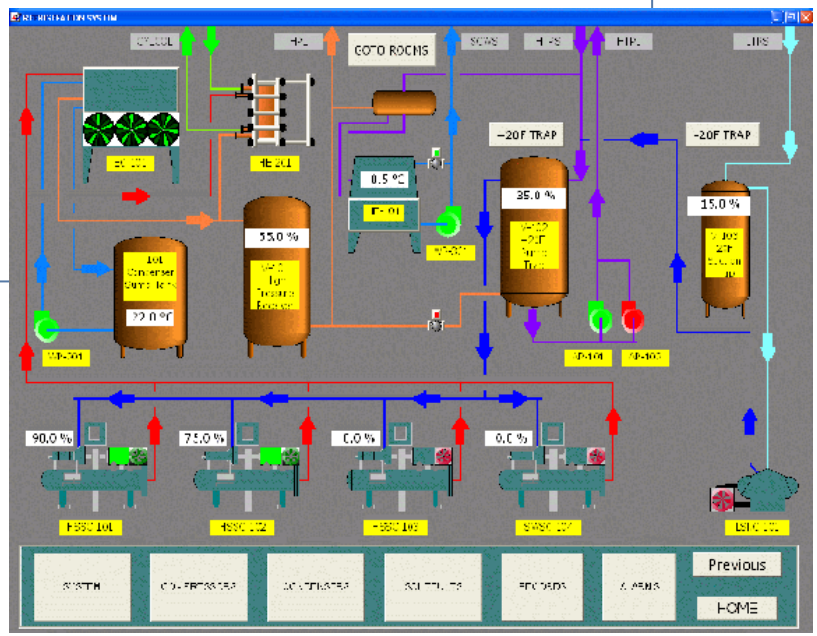
- European membership-based NGO
- Organisations and individuals can be members
  - 75 organisations
  - More than 400 individuals
- Evidence-based knowledge
- Seminars and publications
- Web site on EU policies and ecodesign portal
- Summer Study since 1993
- Industrial Summer Study since 2012


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eceee 2014
Industrial Summer Study
on energy efficiency
2–5 June 2014
RETOOL FOR
A COMPETITIVE
AND SUSTAINABLE
INDUSTRY
Papendal Hotel and
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the Netherlands

From the age of tools to the age of systems…

'Human-made artefacts are becoming systems' (Labanca, Bertoldi, 2013)

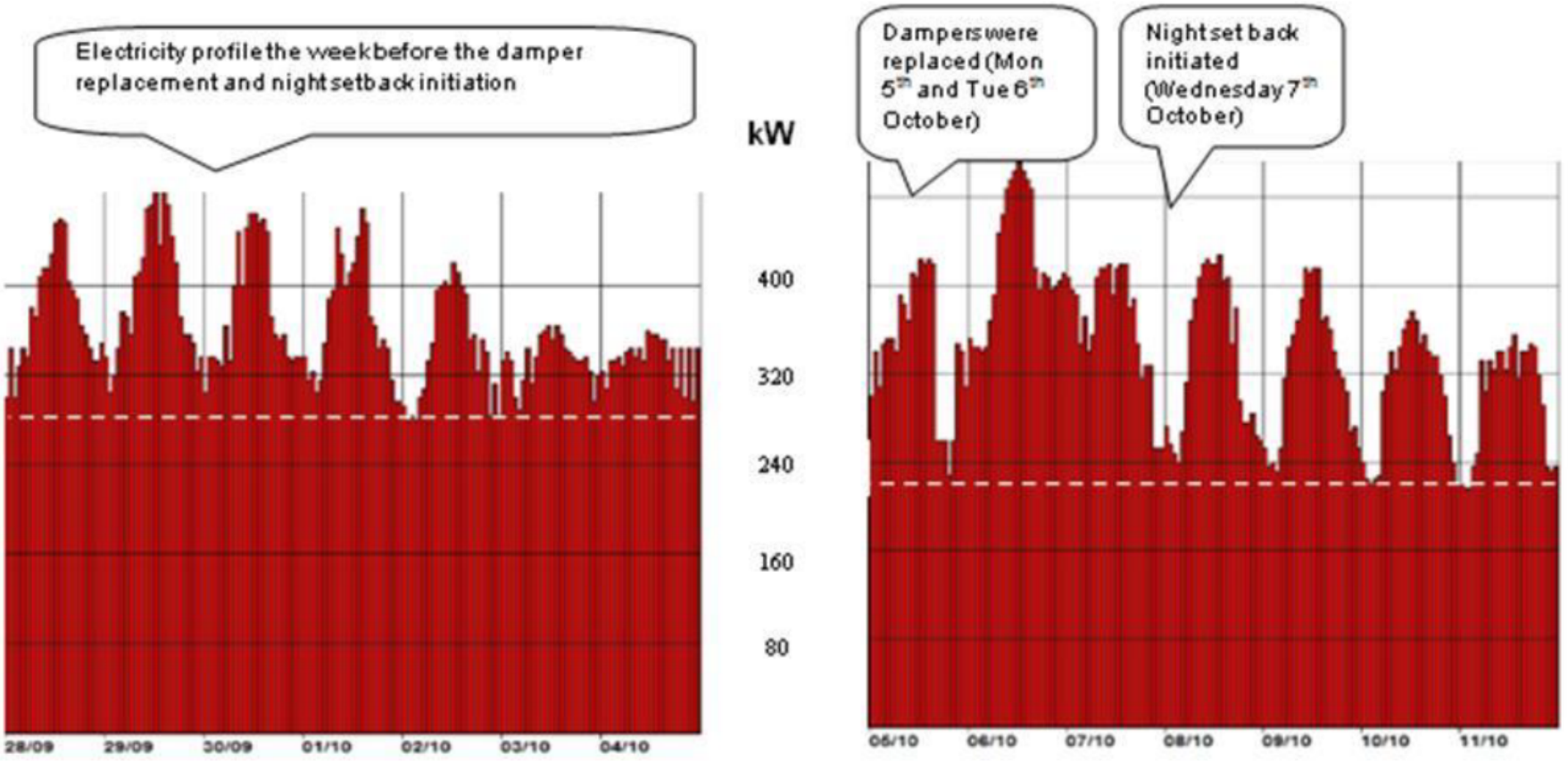




Building example

Source: Waide Strategic Efficiency (2013)

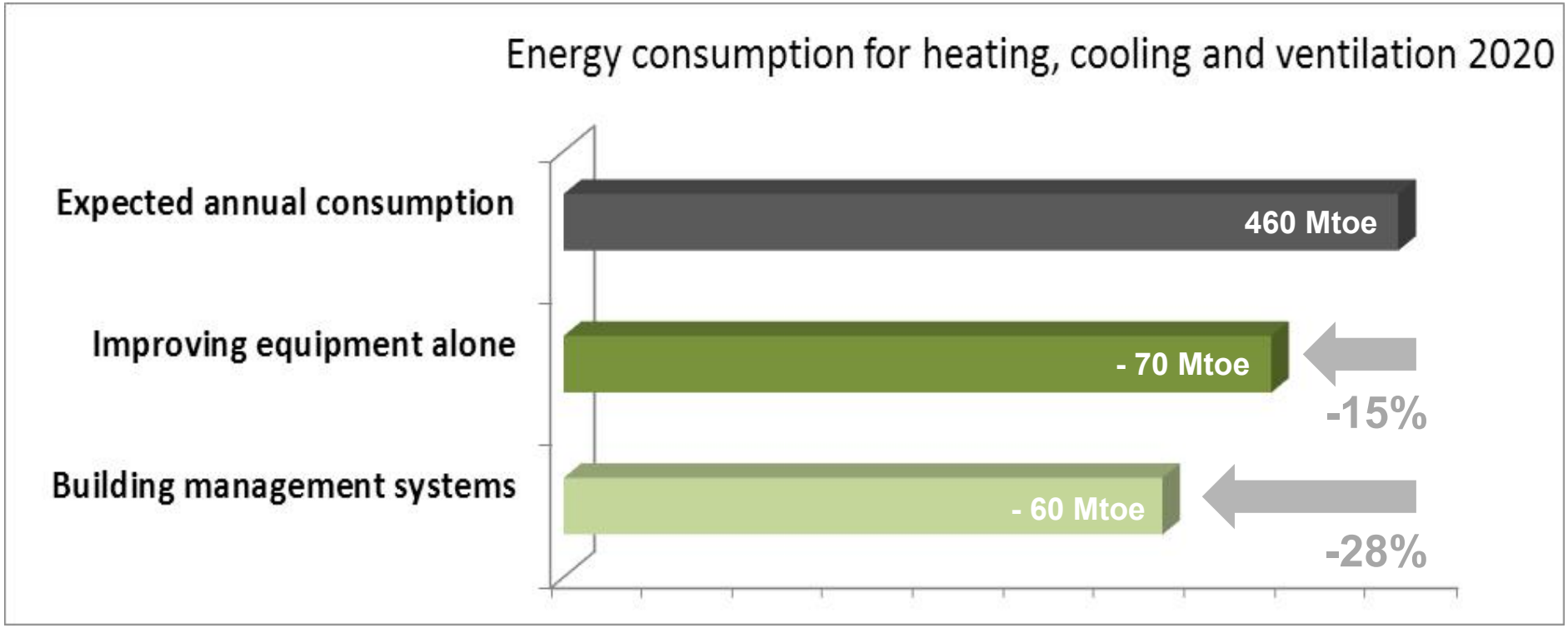
Energy savings achieved in a laboratory building at Imperial College, London, UK.



System optimisation through differential pressure sensing between rooms, motorising balancing dampers, commissioning the system to reduce air flow during silent hours.

Annual savings: € 60,000.

Residential & service buildings
Estimation of EU 2020 potentials



(excluding insulation and refurbishment!)

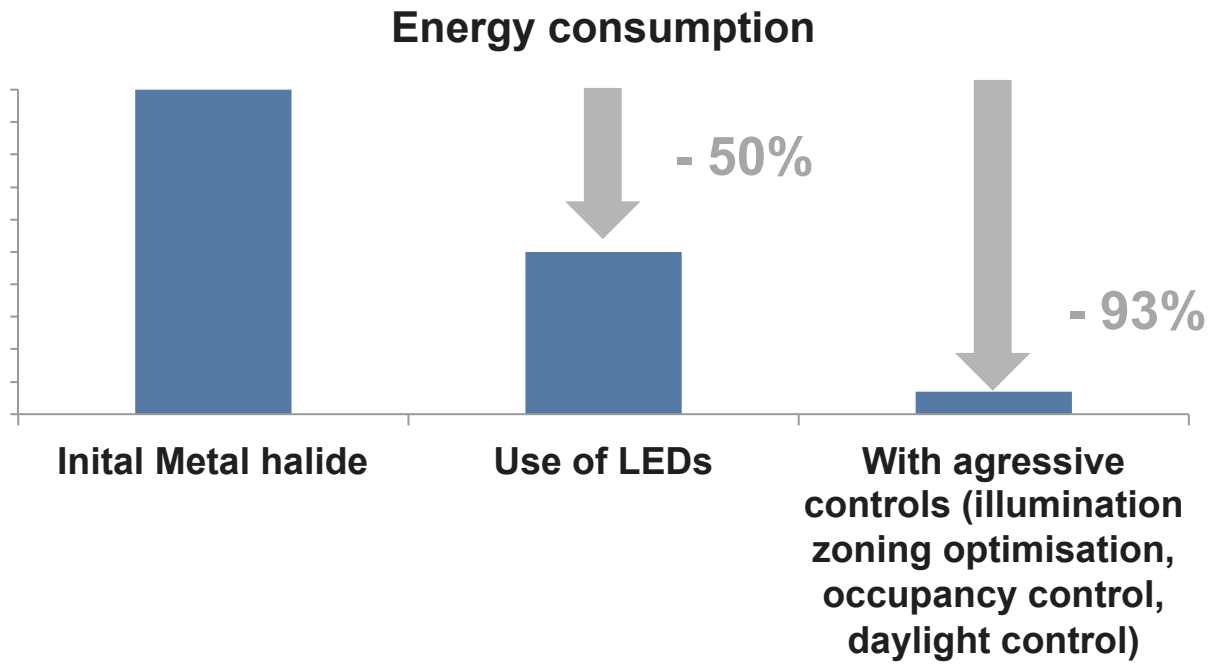
Source: EC Ecodesign regulations ; Waide Strategic Efficiency (2013), The scope for energy and CO2 savings in the EU through the use of building automation technology

Lighting example

Source: PG&E Ace Hardware LED High-Bay Lighting and Controls Project (2013)

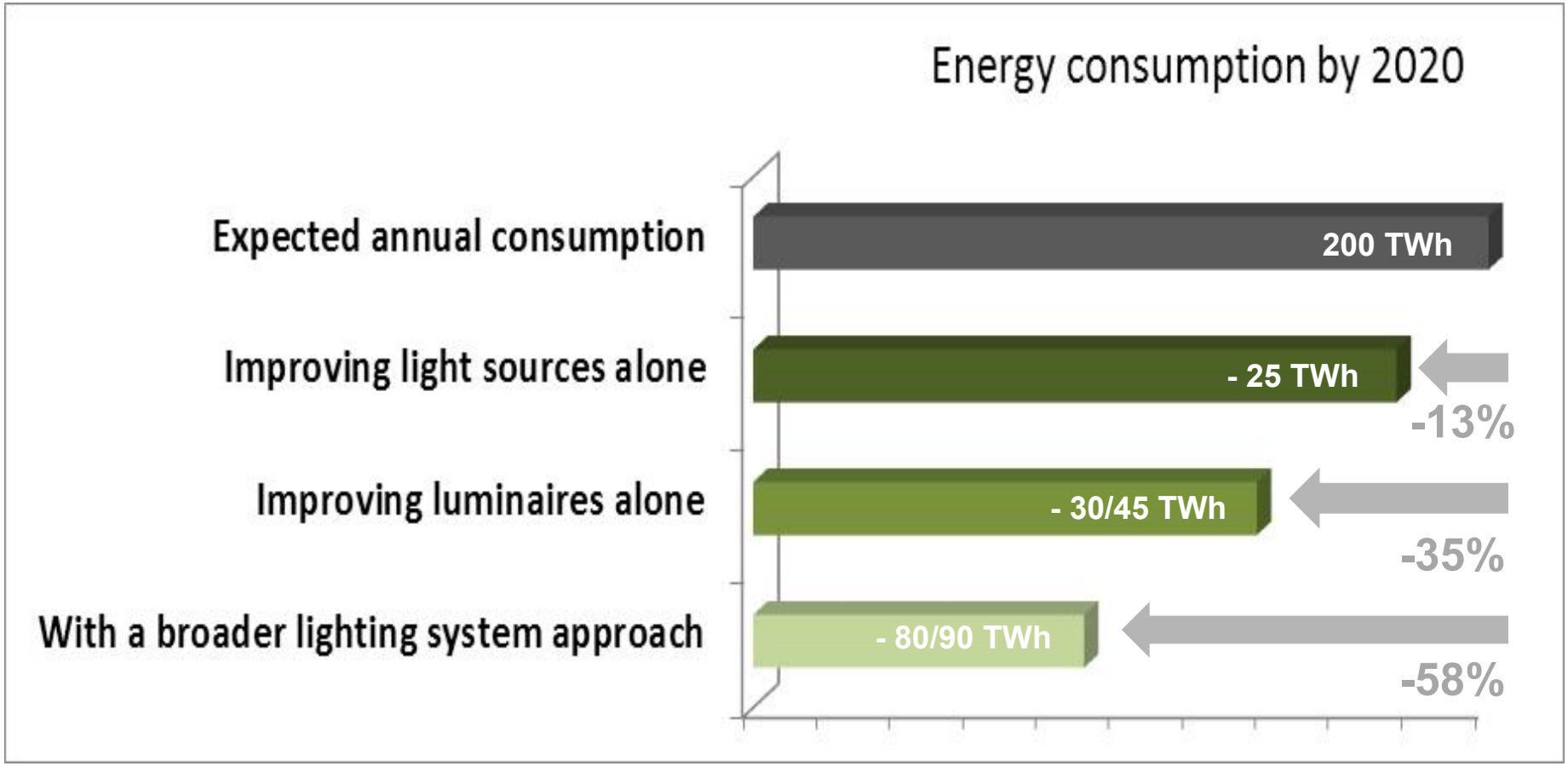


Integration of LEDs in combination with lighting controls in a warehouse space (with part natural light).





Tertiary lighting
Estimation of EU 2020 potentials

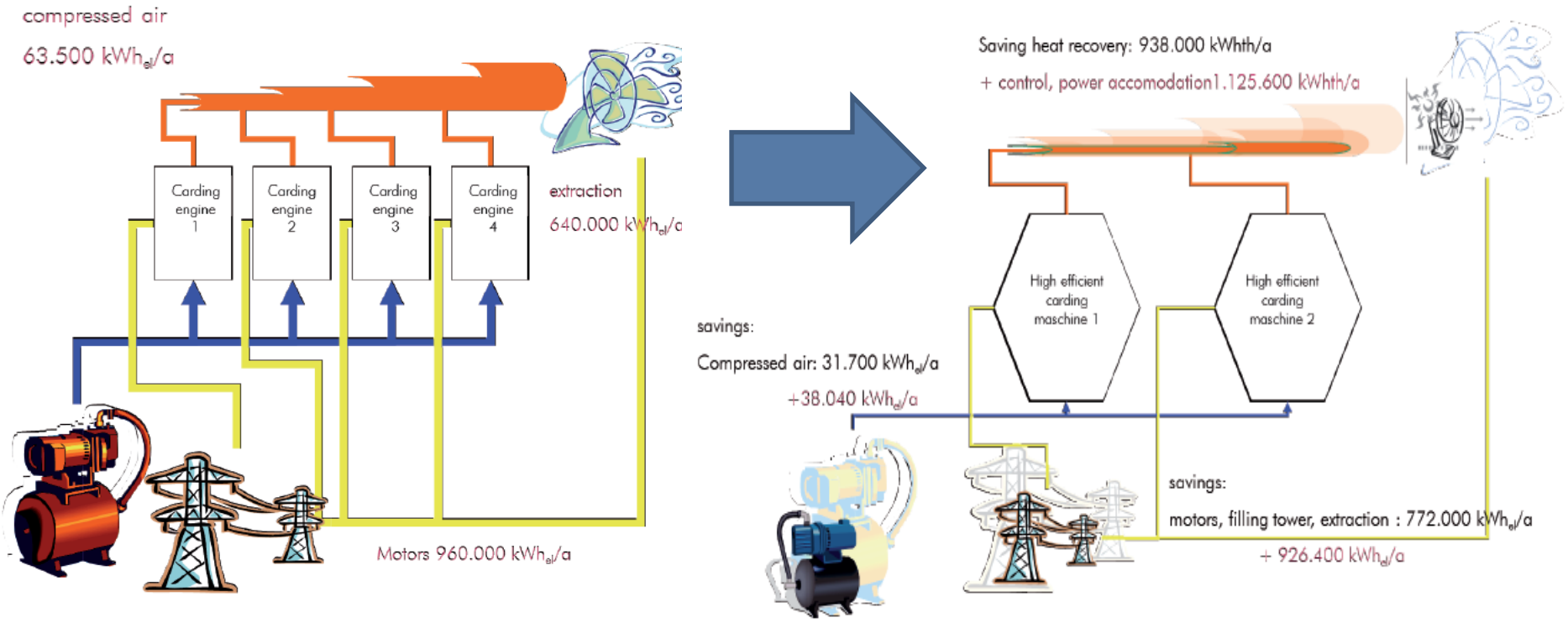


Source: EC Working document and Impact assessment study on measures targeting the energy efficiency of lighting in the tertiary sector (2009/10)

Example in industrial processes


Made in New Zealand

Source: Sattler Energie Consulting (2012), Extensive energy savings by applying the system-approach



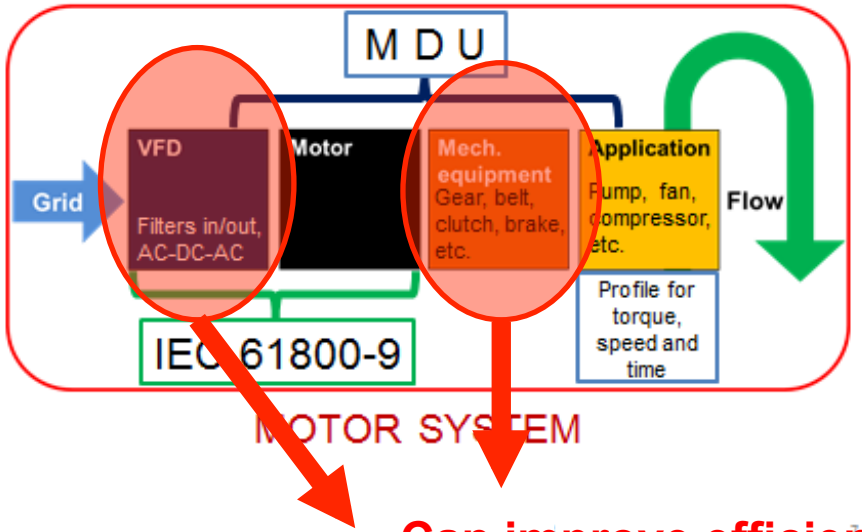
System optimisation of a carding process
(mechanical process that breaks up fibre locks and aligns the fibres).

- **Improving the carding machines and basic process alone: 50% savings on electricity**
- **Optimisation of process steps and peripheral systems: further savings of 20% on electricity, and on heat recovery equivalent to 13% of initial energy load**

Sources: IEA 4E Annex Motors; LBNL (2011), Max Tech Appliance Design : Potential for Maximising U.S. Energy Savings through Standards.

Focus on motor-driven systems

Motor Driven Unit



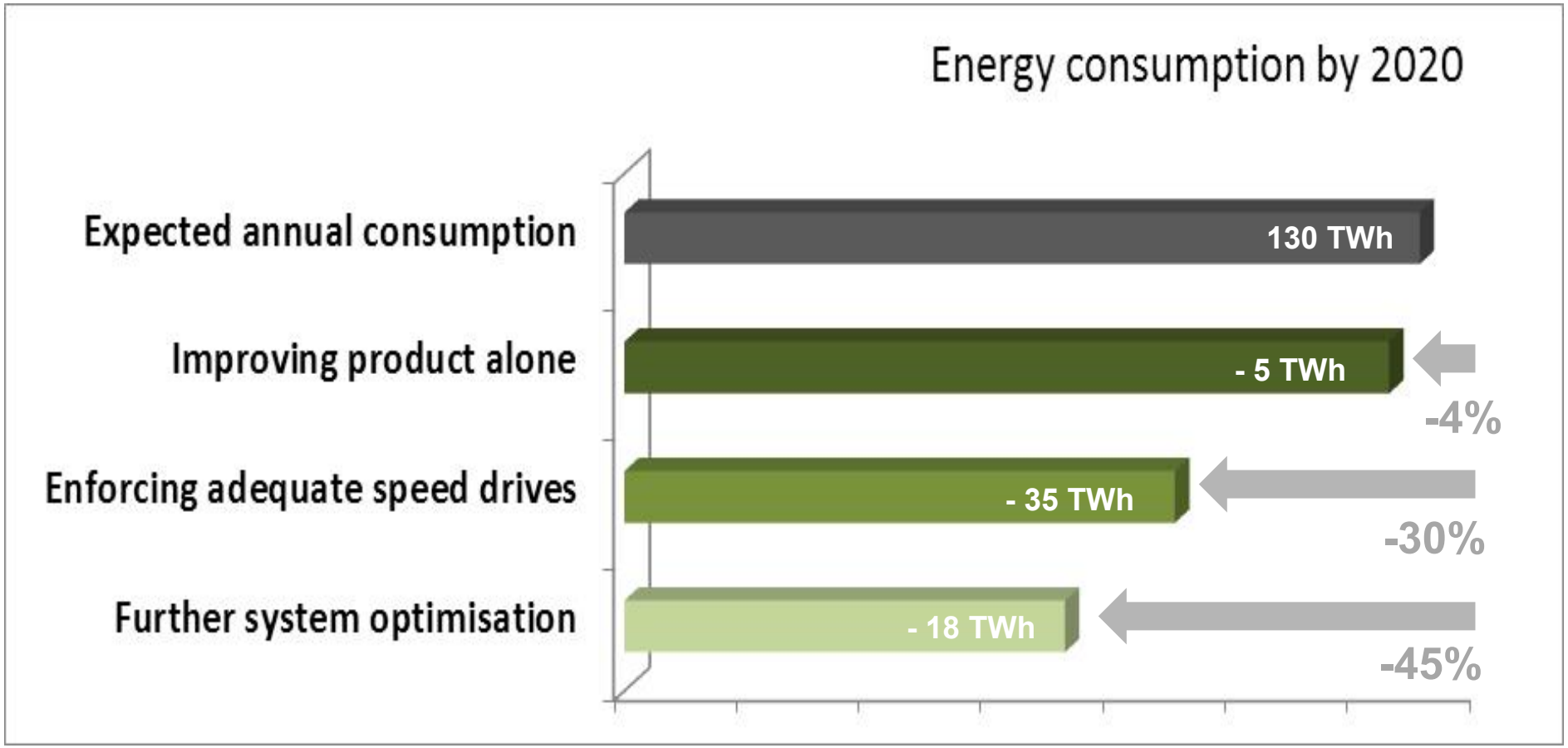


Can improve efficiency of the system by 30-50%

Other possible system optimisation: replacing a large equipment by a network of multiple smaller ones that can be turned off

→ **20-50% improvement potential. Can apply to compressors, pumps, transformers, power supplies.**

Pump example
Estimation of EU 2020 potentials



Source: EC Impact Assessment Studies; BPMA (2011), Product, Extended Product and Systems Approach Developments within the Pump Industry across Europe

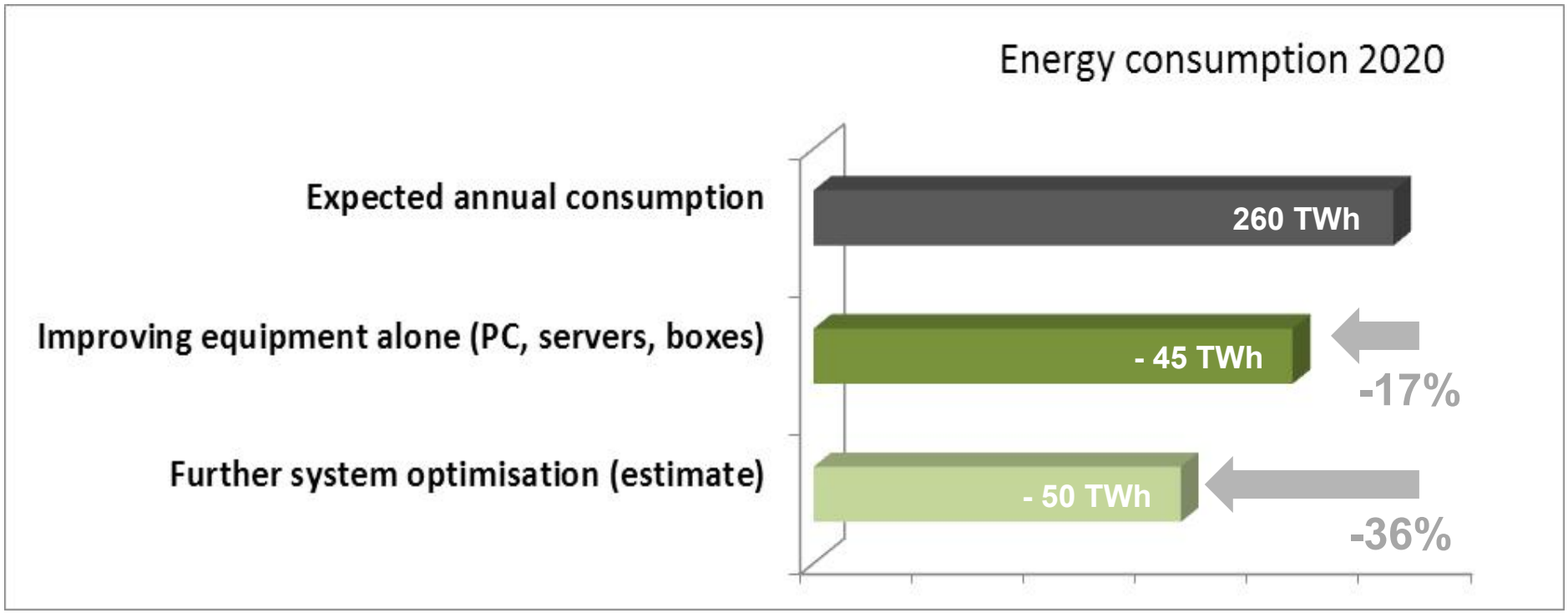
Other system examples

ICT networks!



- **Smart auto-powering down of products through networks (‘*system standby command*’)**
- **Scaling the network power in proportion to the task requirements**
- **Optimising communication between components**
- **Etc.**

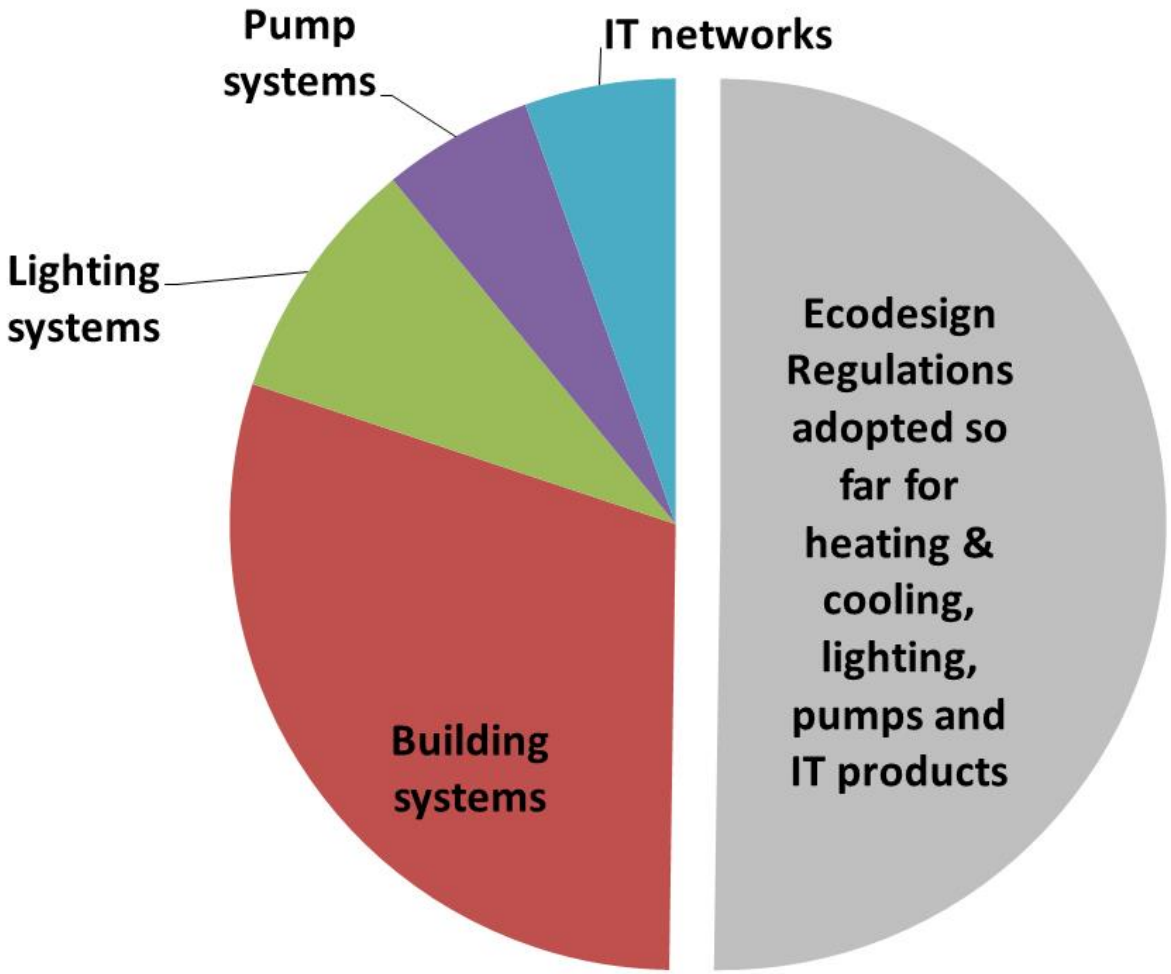
ICT network example
Estimation of EU 2020 potentials



Source: EC Ecodesign Regulations; BIOIS (2008), Impacts of Information and Communication Technologies on Energy Efficiency; own estimates

Overview

System potentials match product potentials!



Energy saving potentials by 2020 against business-as-usual

Recommendations for policy

Source: BRE study for DEFRA (2011)
Policy Making for Energy Saving in Systems

Initial steps

1. Identify serviceable functions and most promising potentials
2. Decide what type and level of intervention is practicable
3. Investigate current system benchmarks
4. Check potential conflicts with existing legislation
5. Define the system using an extended product approach
6. Justify the choice of the system vs product/component

Implementation

1. Develop methodology/measurement to evaluate performance (aim for a single index of performance)
2. Ensure that evaluation is based on installed conditions
3. Identify critical aspects of design, installation, maintenance
4. Identify requirements for inspection, measurement, replacement
5. Ensure provision of guidance and training
6. Promote and then review scheme

Thank you for your attention

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Nils Borg, eceee - Ecodesign seminar “System Approaches in Product Policies”
4 February 2014