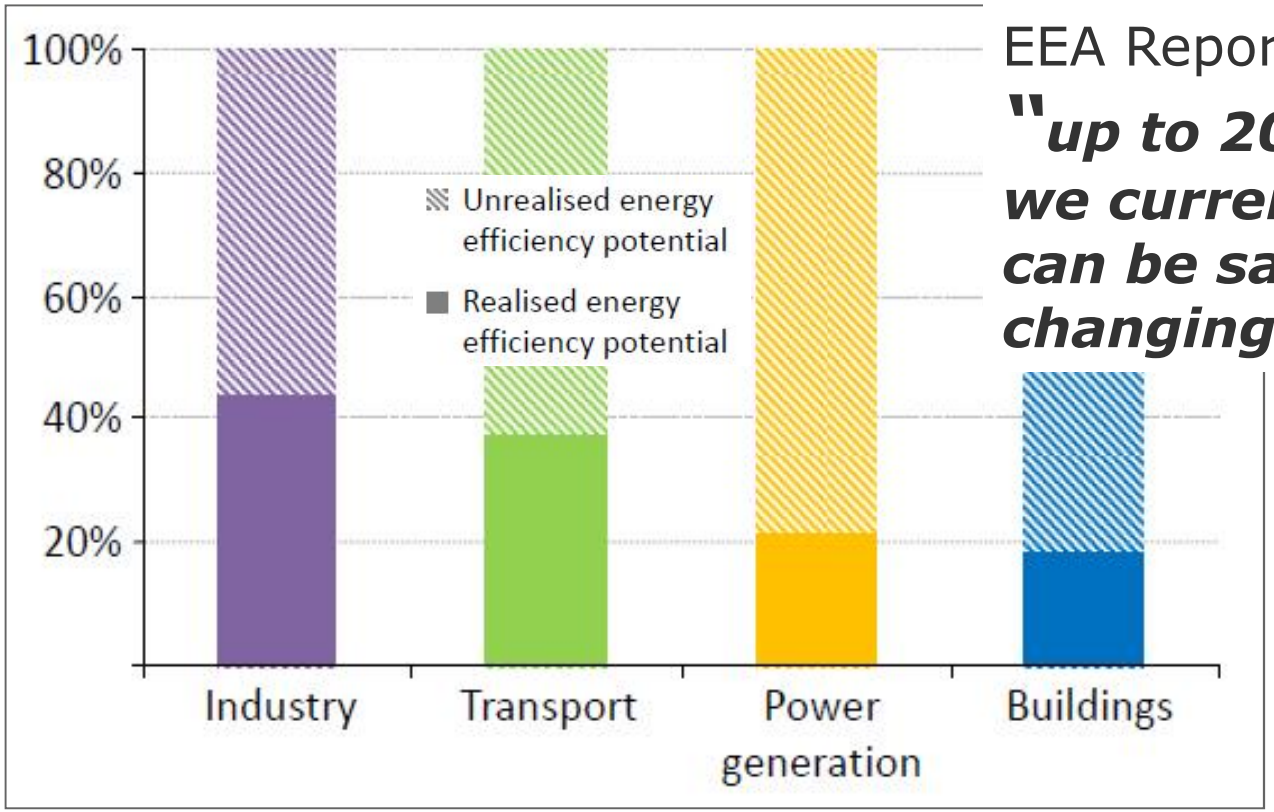
It's Cultural: Energy Efficiency & Behavioral Programs for the Industrial Segment

Ulrika Wising & Sophie Chirez

Behavior change is "key"



EEA Report, April 2013

"up to 20% of the energy we currently consume can be saved through changing behavior"

One of the factors that contributed, in part, to the downward trend of our energy consumption was the engagement of the workforce.

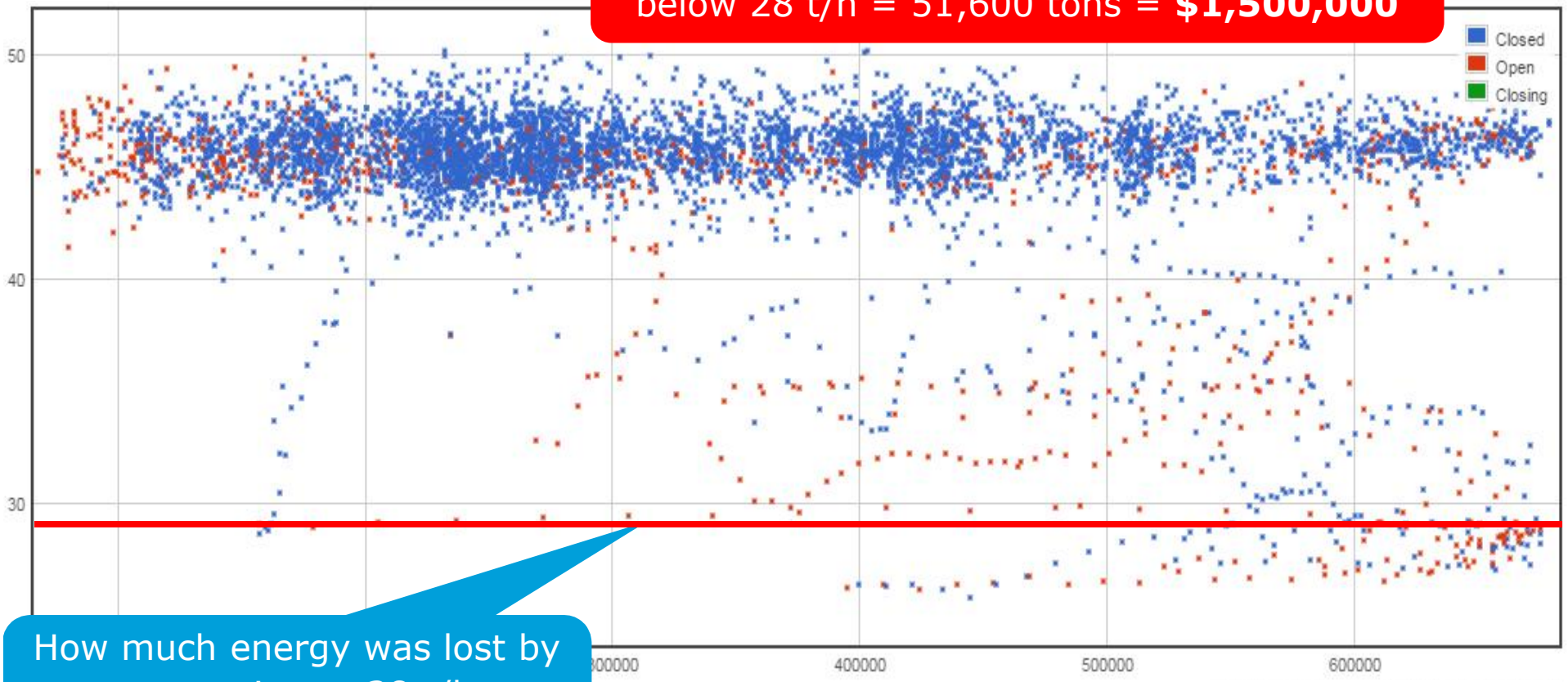
"Two-thirds of the economic potential to improve energy efficiency remains untapped in the period to 2035"

IEA, WEO 2012

Roughly 50% of the savings were achieved by engaging the workforce to improve existing assets.

Variability of how the process is run is directly linked to behavior

Saved amount of steam if all red dots were below 28 t/h = 51,600 tons = **$1,500,000**



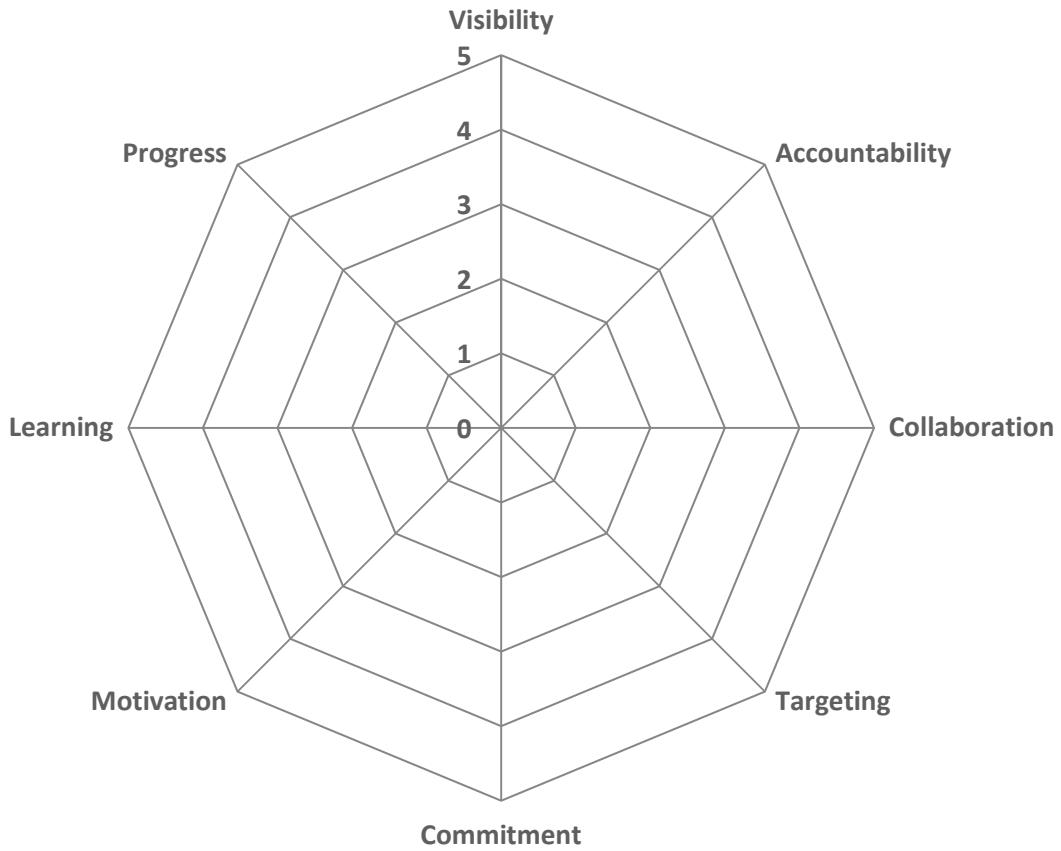
How much energy was lost by not operating at 28 t/h or below when valve was Open?

What is Energy Culture?

A **shared mindset** that creates and sustains an environment conducive to continual improvement of the energy performance of the energy performance of the organization

How to measure and change Energy Culture?

Energy Culture is quantified in **eight** characteristic **dimensions** with **five** maturity **levels** for each



This approach builds on

- Models of behavior
- Theories of change
- Experience of DNV GL's "Safety Culture"
- Energy efficiency expertise in industry

How to measure Energy Culture?

Data Analysis

- Identify the potential savings linked to changing behavior
- Baseline is calculated using current energy use
- Potential quick-win optimization projects are identified

Surveys

- Customized surveys are designed
- Surveys enable to collect a large amount of data in a relatively short period of time

Interviews

- Interviews with the management staff to confirm and complement the survey results
- Identification of non-technical barriers and issues faced in daily work

Workshops

- Workshops with engineers and operators
- Brainstorm sessions focused on one key problem

How to improve the Energy Culture

0-6 months	6-12 months	12-18 months	18-24 months
• Create a vision to change energy culture • Update the vision and highlight realistic 2015 & 2020 intermediate targets • Identify quick-wins • Validate the metering plan to ensure adequate meters will be available for quick wins and energy KPI • Include EE in every site wide communication - Quarterly forums – Operator training. Communicate about the vision, targets and key activities. • Identify energy champions in main areas	• Develop an optimal KPI structure from the bottom-up with roles and responsibilities • Create quick-wins • Implement energy meter data acquisition into PI • Develop baselines for main energy users • Communicate the vision for culture change • Develop newsletter & a panel at entrance with info on energy • Facilitate workshop/discussion about energy during operator training. • Set up a formal energy efficiency improvement team composed of champion and train them • Celebrate yearly progress	• Develop dashboards at different levels of the organization (management, engineering, operations) • Set targets for KPI structure • Work on a monthly reporting incl. production, safety, quality and energy (progress vs. targets) • Re-launch a poster campaign with figures related to energy savings • Develop and/or update operational procedures including energy efficiency and energy baselines	• Develop an incentive program including ideas collection, analysis, selection and implementation • Identify best practices in targeted department

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