

P 3 – Monitoring and evaluation

How can information on the real performance of material/energy flows and of implemented measures be used?



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and Production

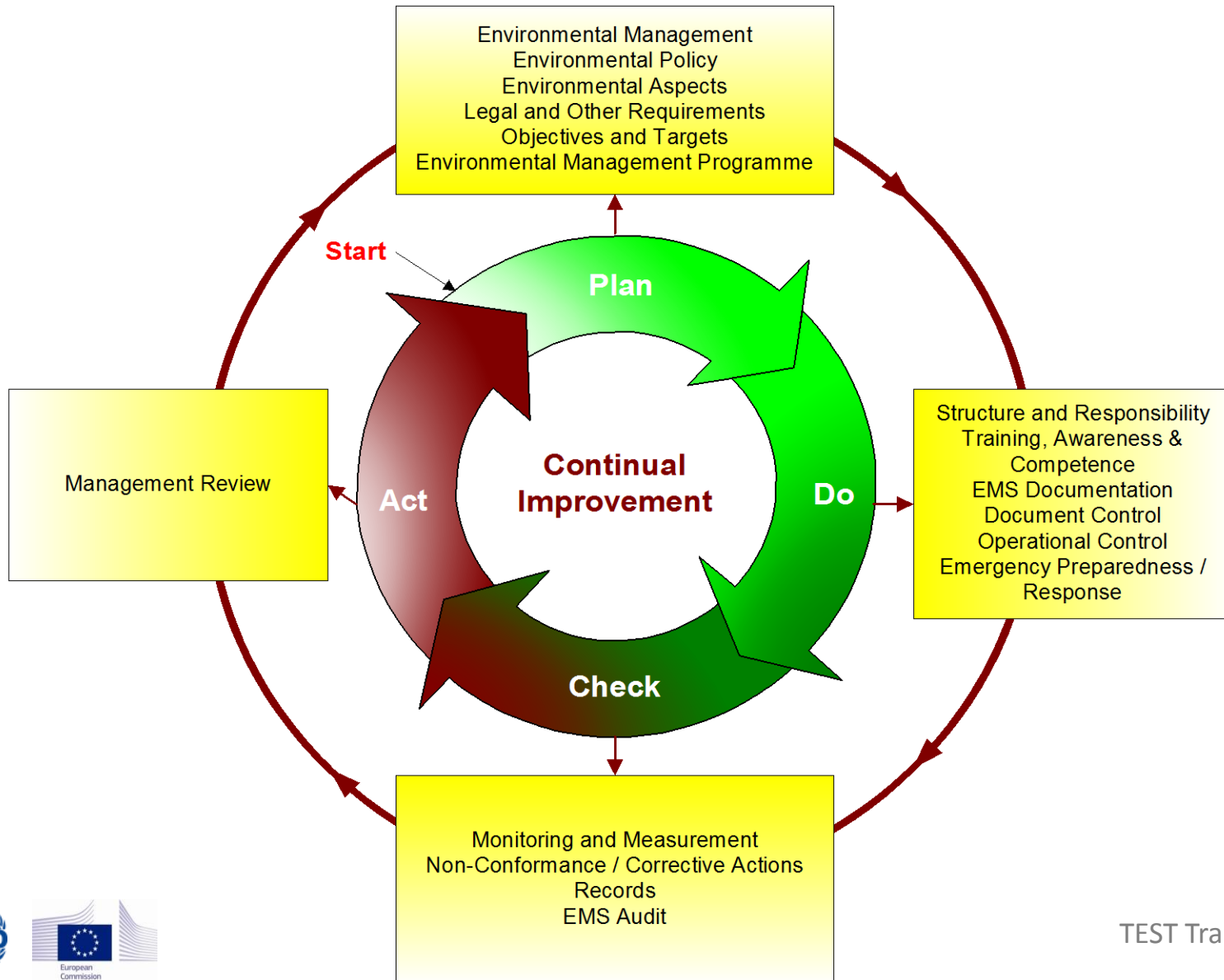


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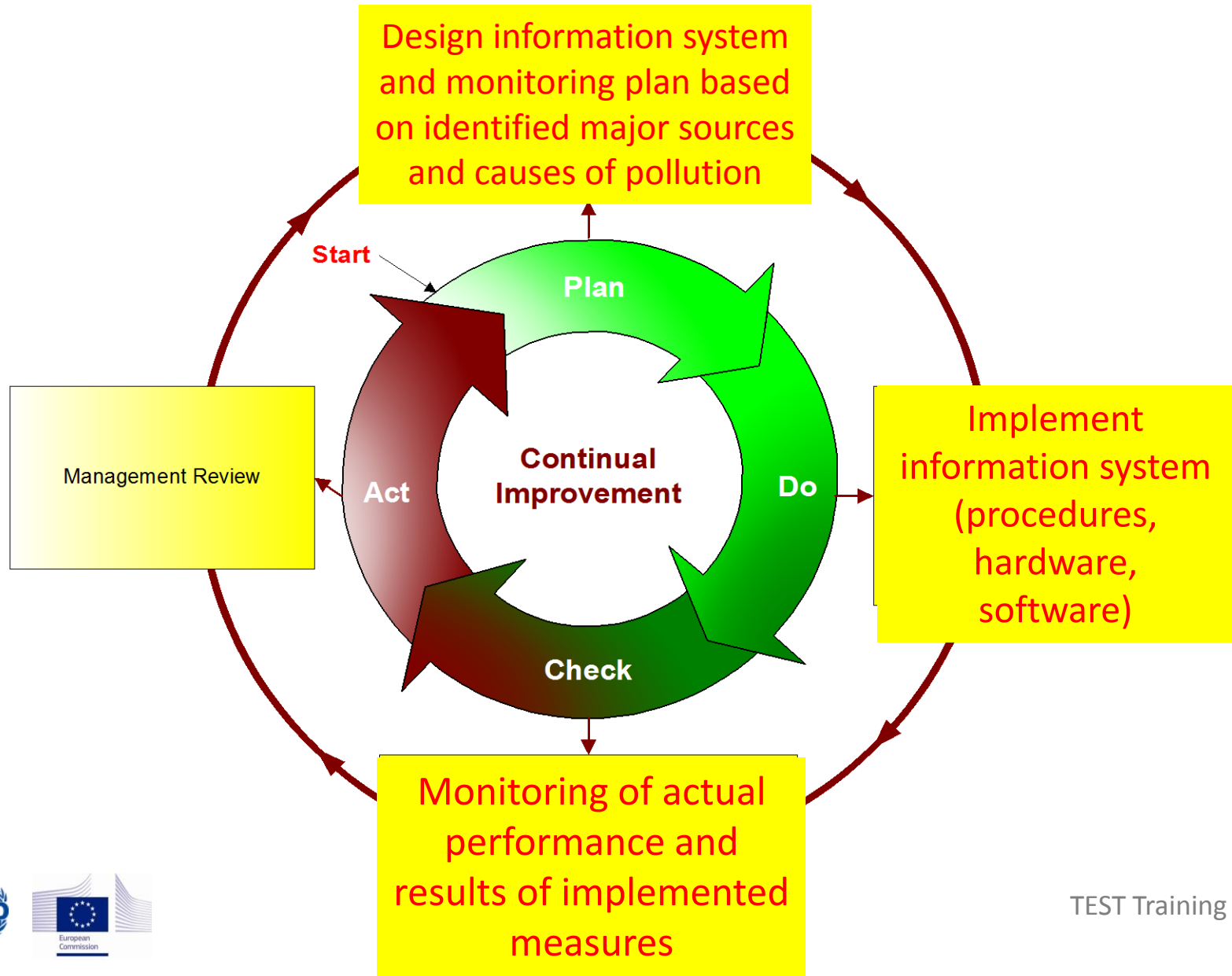
- Overview
- Monitoring and Targeting
- Case study
- Conclusions



Monitoring within EMS



Monitoring flows within TEST



Why Monitoring?

- **Receive feedback on real performance** of implemented resource efficiency measures (**Are the expected savings been achieved ??**)
- Encourage management to continue to invest resources in **sustaining TEST**
- **Identify new improvement measures**
- **External reporting of performance**



Overview of Step 3

Information system on flows with procedures for data collection, documentation and reporting

Monitoring plan

Performance baselines

Collect and process data on KPIs and OPIs set up in the monitoring plan

Compare actual performance report to company goals and targets

Evaluate results

Take corrective action

Monitoring and evaluation as a routine

Continuous improvement of company performance

New baseline of performance indicators

Inputs

Activities

Outputs



MONITORING AND TARGETING



Definition

M&T (TOOL) is based on setting up an **effective**

information system to monitor the **efficiency of use** of energy and material flows

It enables **accountability of people** influencing resource efficiency and **monitoring of implemented measures**



M & T

MONITORING and TARGETING

- Data collection

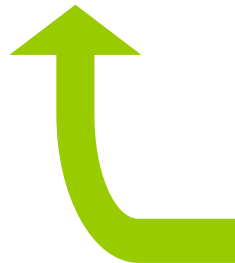
(consumption, production, other factors influencing consumption)

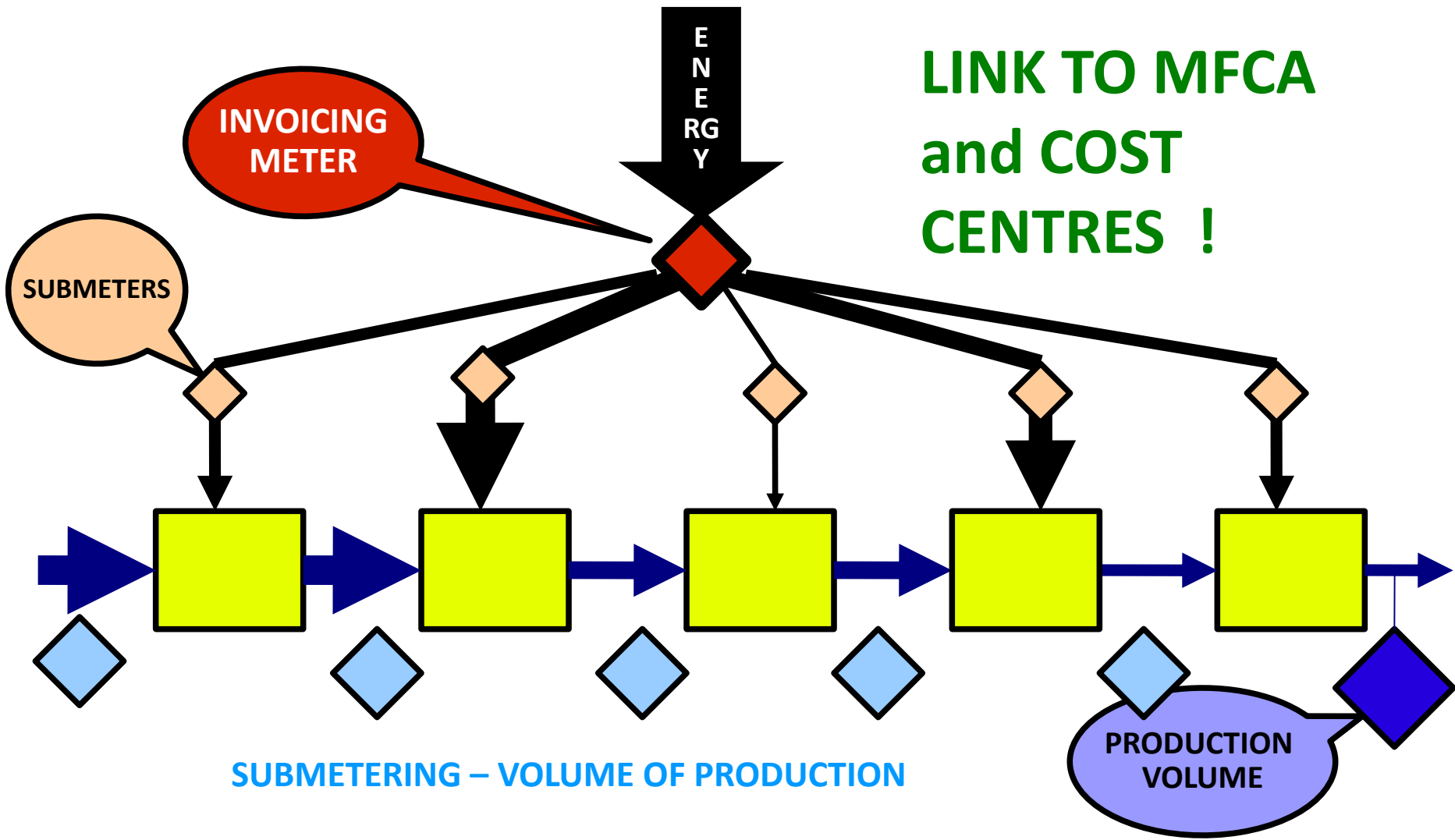


- Data analysis

Understanding causes

- Accountability
- Measures
- Implementing and sustaining change



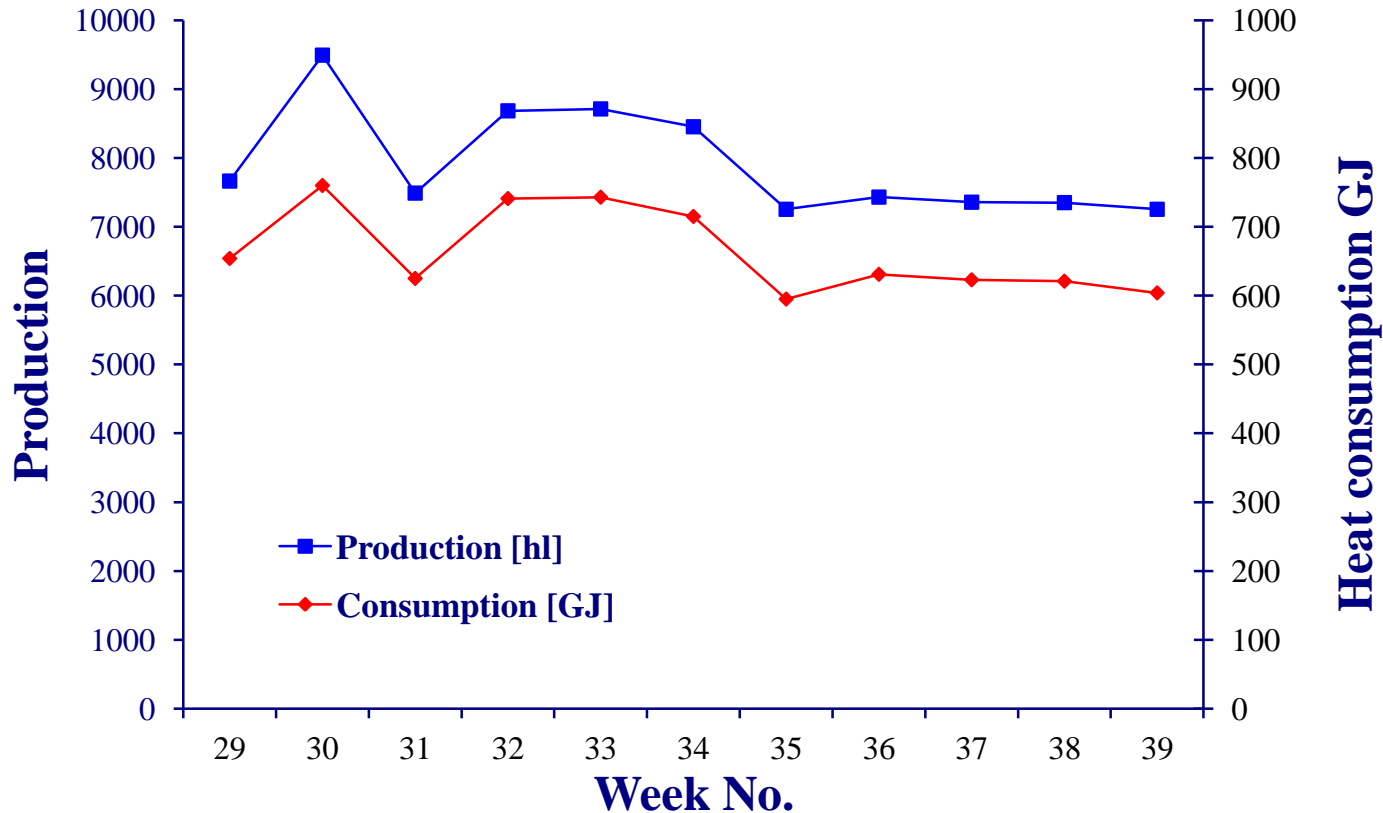


M & T has to be implemented at the level of a specific cost centre:



Monitoring - example

Use of heat in drink production

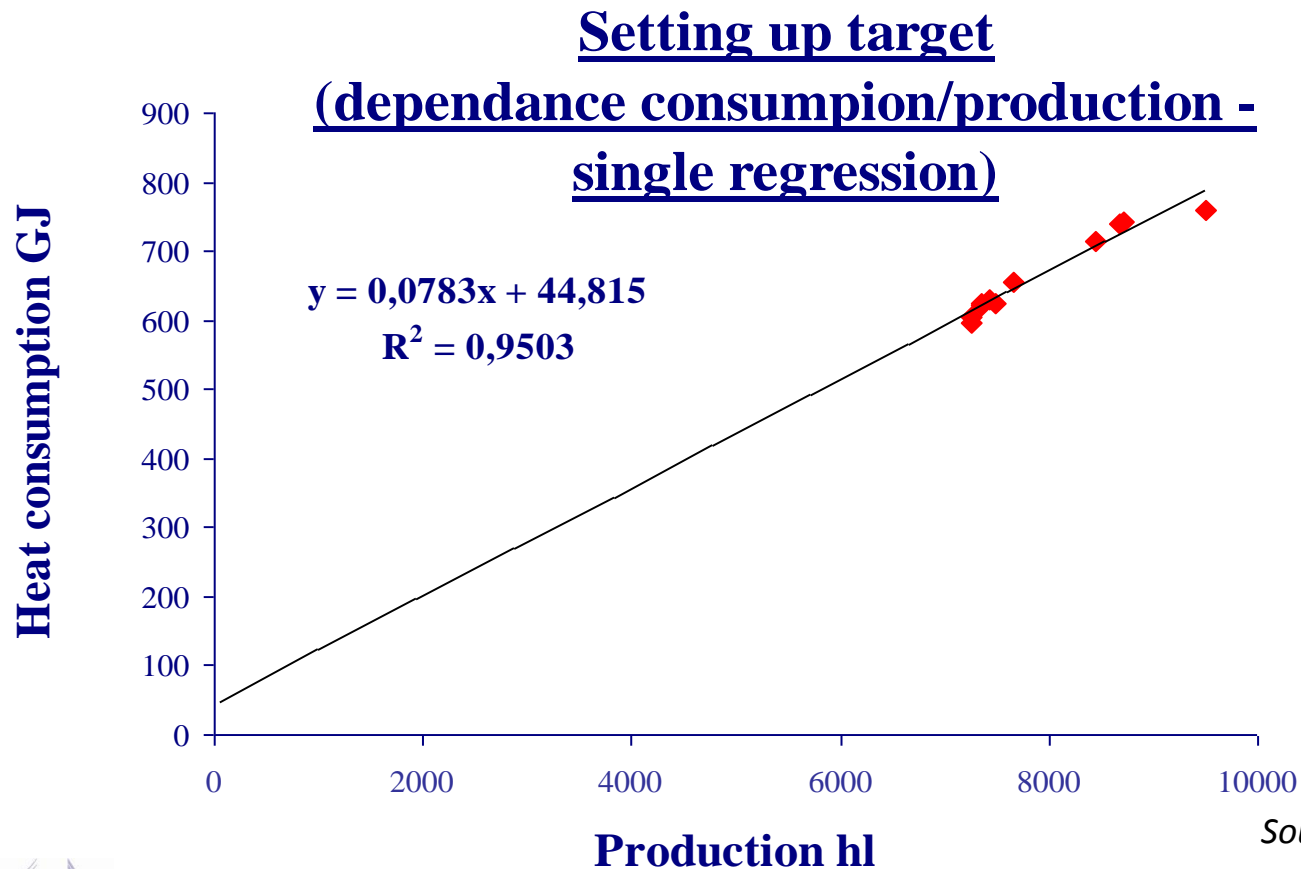


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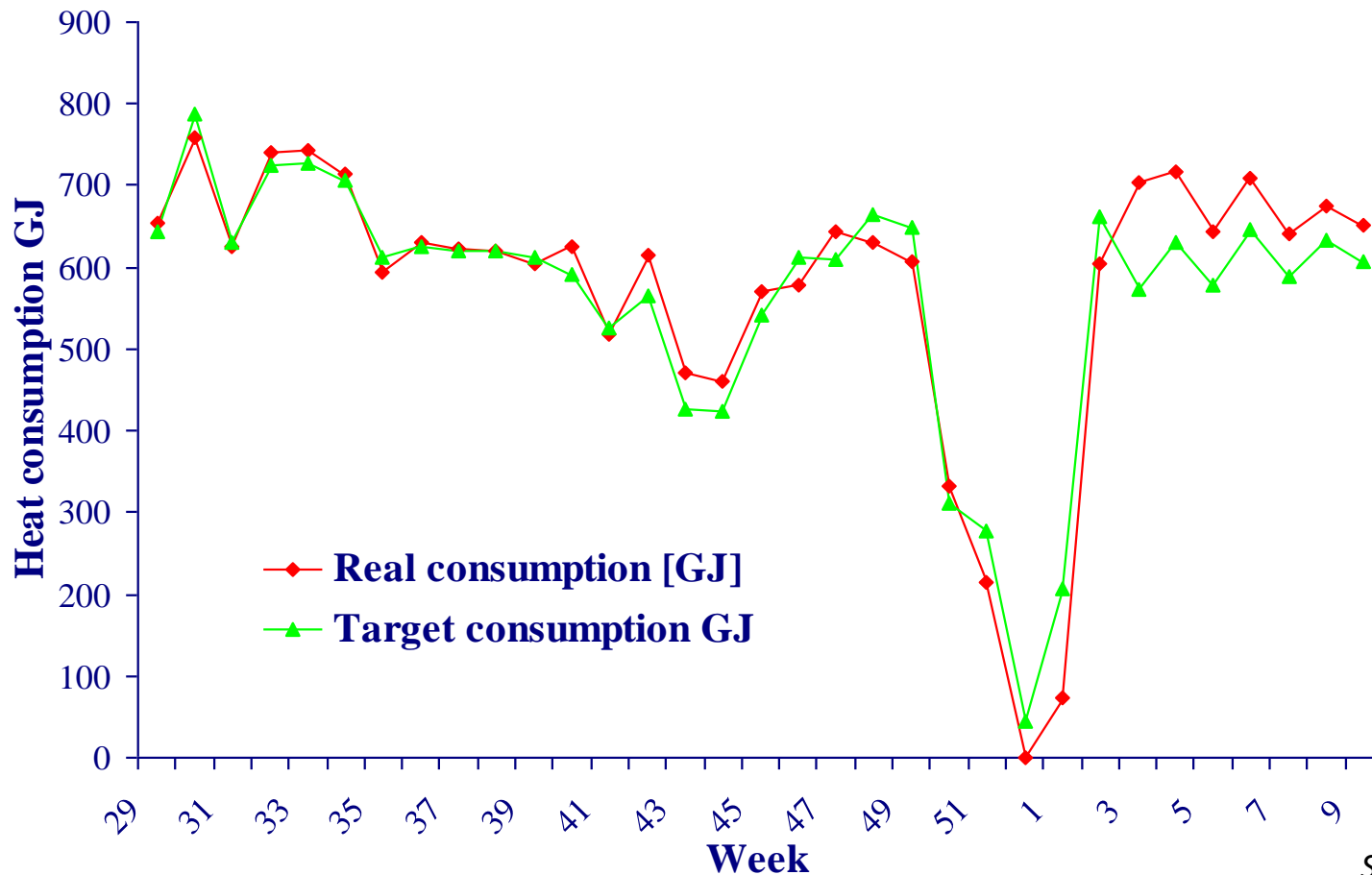
Targeting - example



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Implementing M&T - example

Problem identification

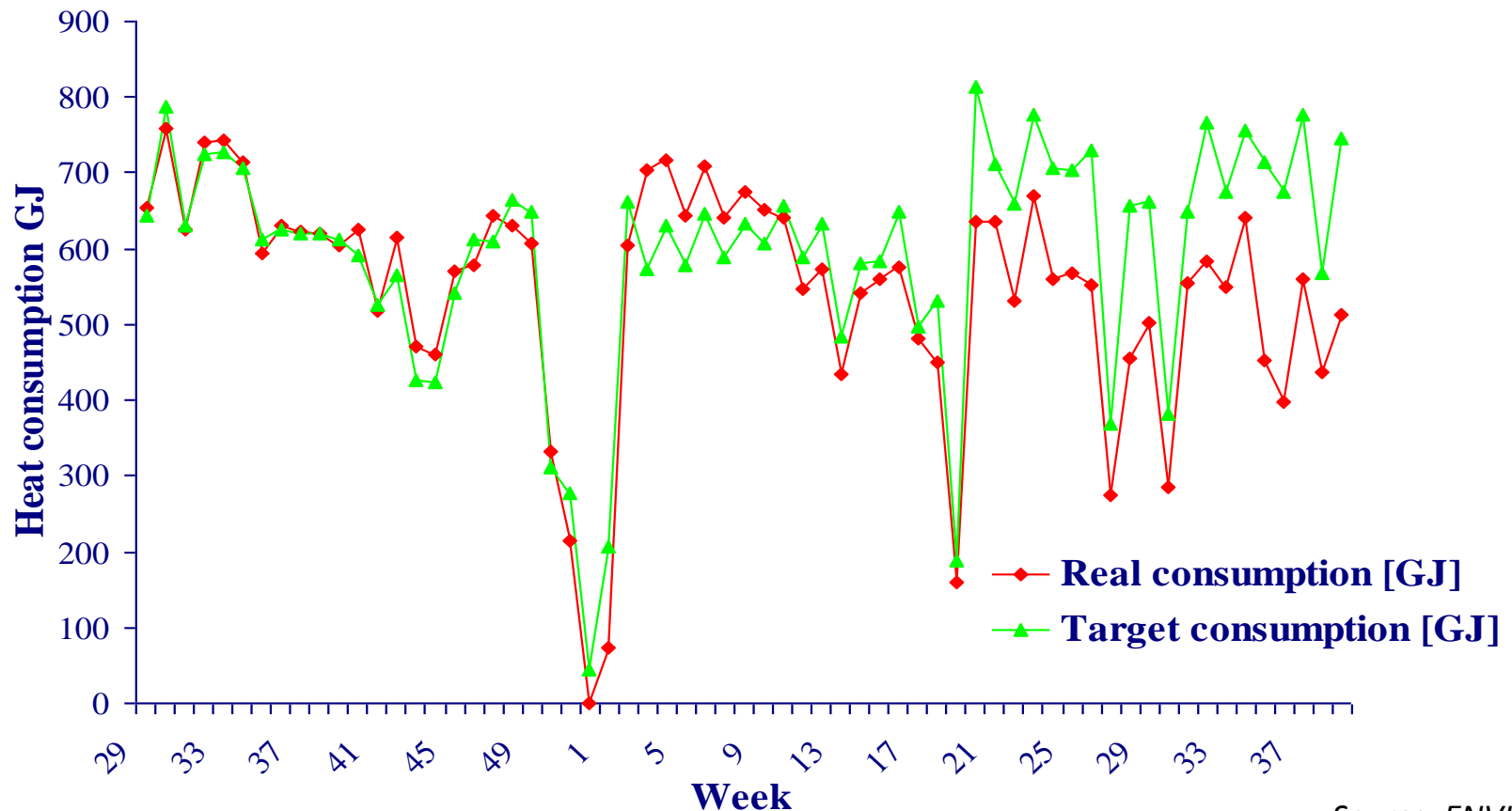


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Implementation of resource efficiency measure



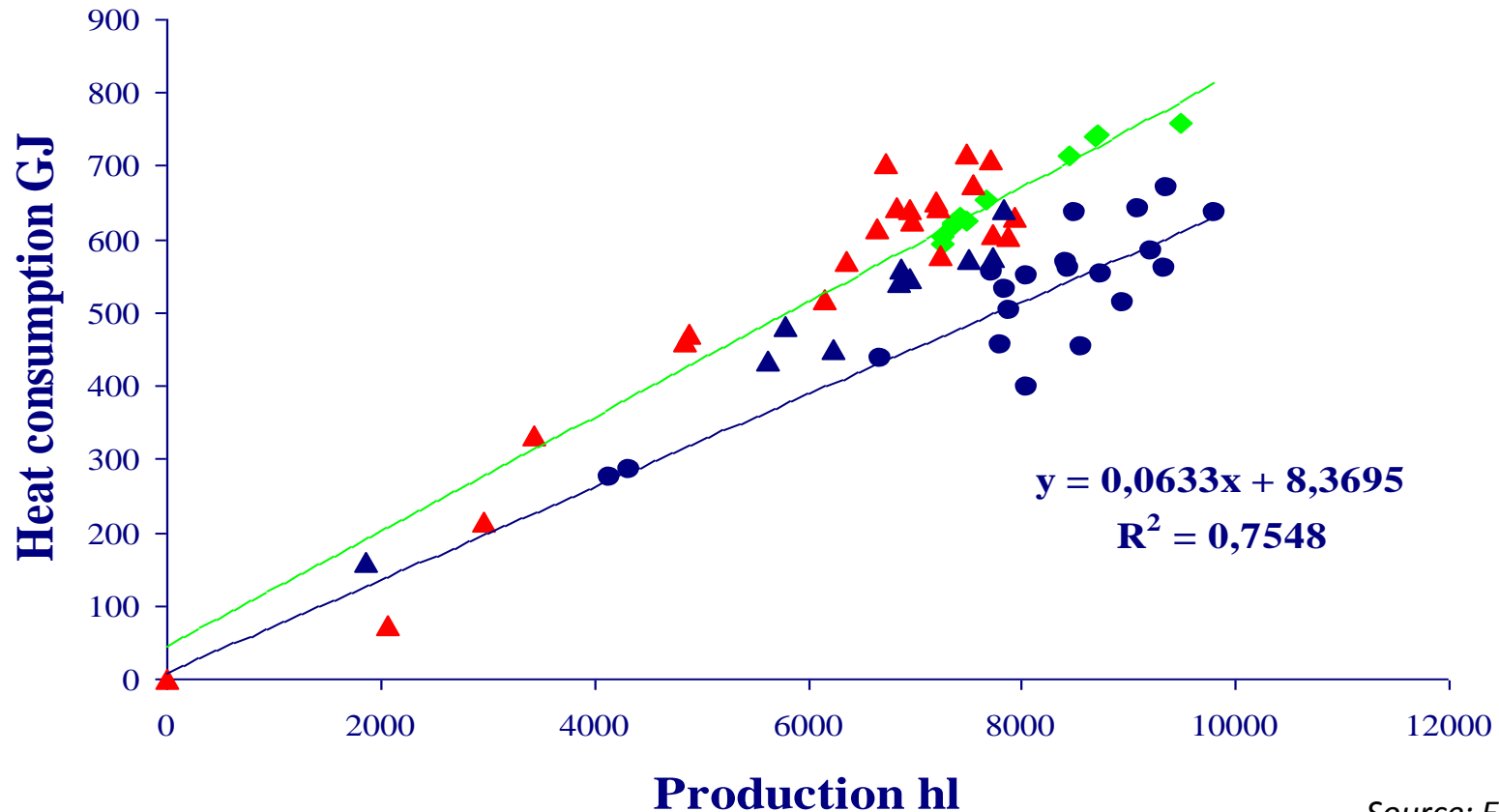
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Effects of resource efficiency measures and new target setting

New target setting



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Case Study M&T/EPC

STARTING SITUATION

- Electrotechnical Industry, site build on green field (production, storage, administration buildings)
- High ratio of costs to ensure quality of working environment
- Rising energy costs and enterprise goal to increase energy efficiency

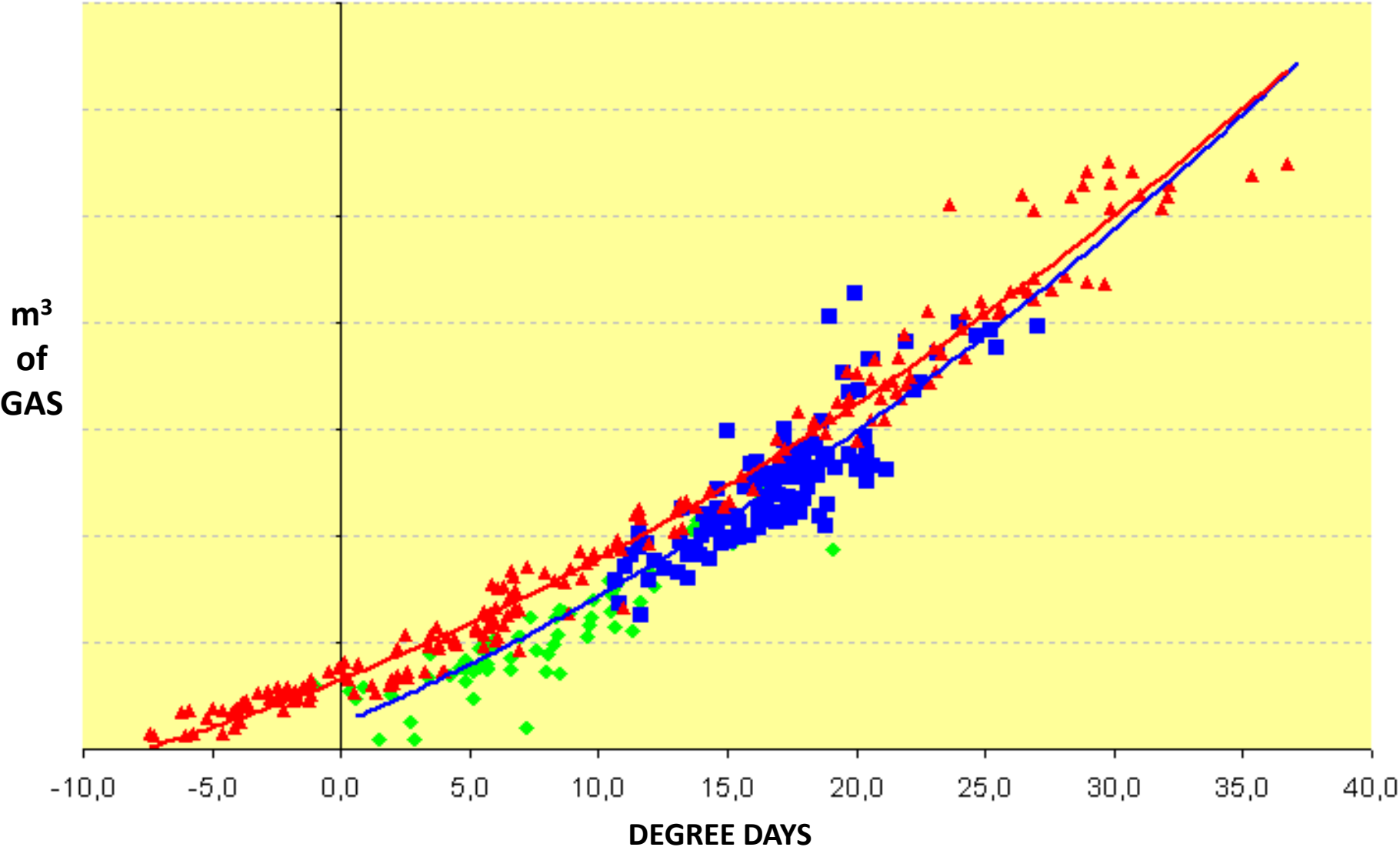


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Case Study M&T/EPC

POTENTIAL FOR SAVINGS



Case Study M&T/EPC

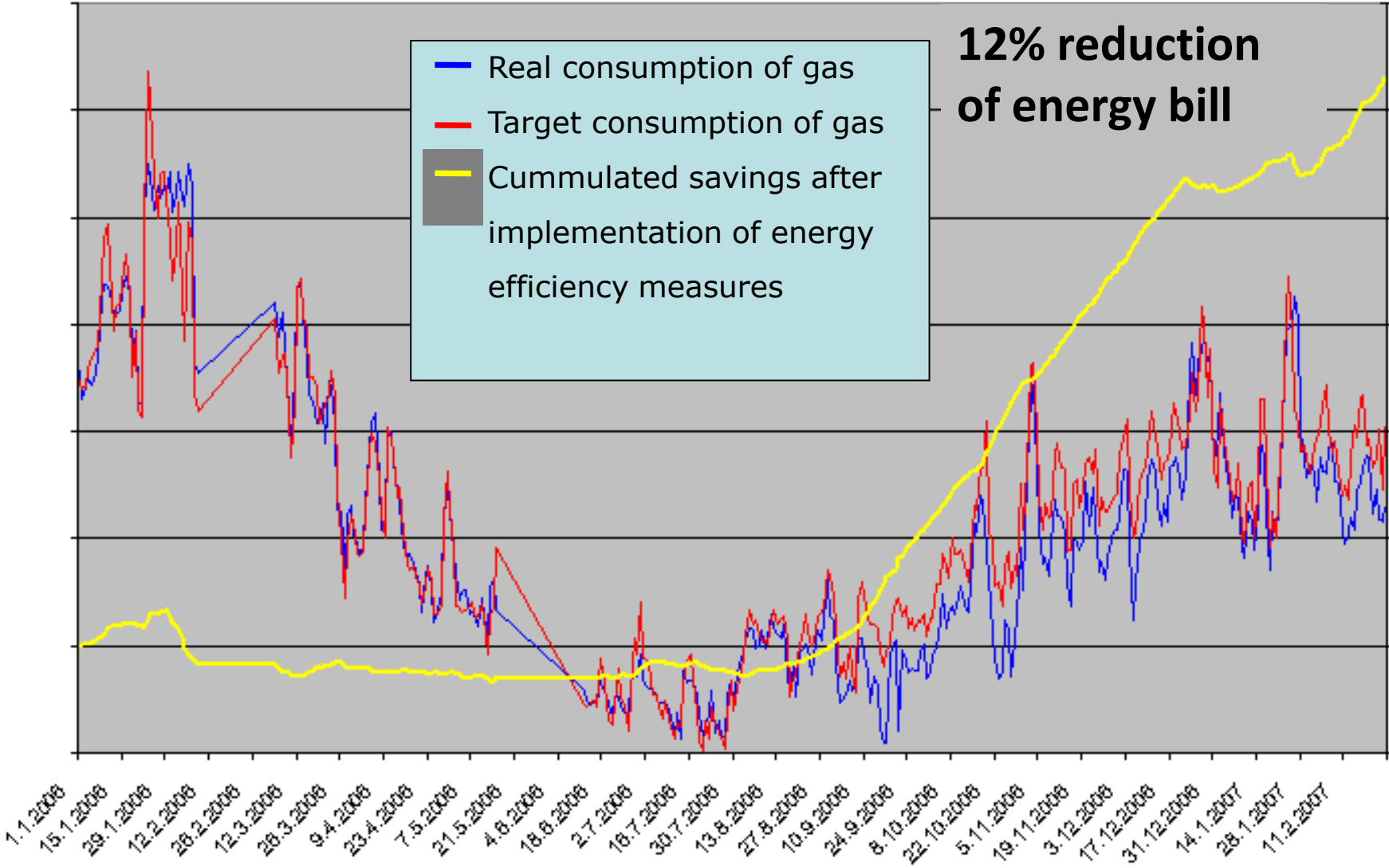
PROJECT PHASES

- Initial Review: identification of minimum potential for savings, project proposal including financing of energy management from savings (Energy Performance Contracting (EPC))
 - Project focus on energy conservation
- Introduction of system for management of energy flows through M&T
 - Instalation of system of submeters
 - Instalation and tuning of software based information system
 - Assigning responsibility for energy efficiency to people influencing efficiency
 - Regular data analysis and resulting energy conservation measures
- Implementation of energy conservation measures
 - Amendment of systems functions, amendment of system operational parameters
 - Utilising waste heat, accumulation of cold
 - Modification of system for moisture control etc.
- Repayment of the initial costs from verified savings throug the EPC method



Case Study M&T/EPC

EFFECTS OF IMPLEMENTED MEASURES



Monitoring and Targeting tool enables to

- **Visualise** energy consumption and cost trends in the past
- **Estimate** potential for savings
- **Set up** performance targets for energy management programs (and to determine future energy use when planning, for example, an increase in production volume)
- **Identify** areas where energy is not utilised efficiently, **understand** causes of these losses and to **develop and monitor resource efficiency measures**



Conclusions

- Monitoring and evaluation requires dedicated and skilled people and advanced information system
- The results of monitoring and evaluation, when discussed inside the company, offer opportunities for organizational learning
- Evaluation of actual performance should be compared to existing enterprise policy, objectives and targets
- If monitoring shows sustained, stable performance improvement based on an implemented measure, a new baseline should be set for KPIs and OPIs.



Linkages with EMS

EMS
Not in place

- Procedures and work instructions should be developed for data collection, processing, documentation, evaluation, reporting and for preventive and corrective action such that they can be integrated into a formalised management system.

EMS
In place

- Upgrade the information system on resource efficiency
- Evaluate environmental objectives and targets
- Adjust implemented RE measures utilising existing procedures

Thank YOU for your Attention

