

Presentation 3.2: Demand side energy management

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Abstract

With Demand Side Energy Management Siemens Industrial Services has created a package of services to provide sustained improvement in the energy efficiency of a production facility while reducing energy consumption.

The profitability of a production facility also relies on an inexpensive and reliable supply of power, heating, cooling, and compressed air. The provision of energy, is no more than just a secondary process outside the core competence. Most of all, however, it's a cost factor. Aim is to use energy much smarter, thus increasing productivity.

Demand Side Energy Management from Siemens Industrial Services takes a detailed look at the technical and economic aspects of the entire process. This enables us to develop a step-by-step concept to improve energy efficiency in line with the business needs – and then to implement it.

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Demand Side Energy Management

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Agenda **SIEMENS**

Agenda	
Benefit and added value	▪ Benefit and Added Value
Focus	▪ Focus
The concept	▪ The Demand Side Energy Management Concept
The attractiveness of DSEM	▪ The Attractiveness
Some references	▪ Some References
Contact	

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Benefit and Added Value SIEMENS

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A one shot energy reduction program

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"Yoyo"-effect
Non sustainable

Energy Costs vs Time - years (0 to 10)

A continuous energy reduction program

↓

DSEM
Sustainable solution

Energy Costs vs Time - years (0 to 10)

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No cure, no benefit

Labor against cost price

x % of the **detected** yearly energy savings from projects that are technically and economically feasible

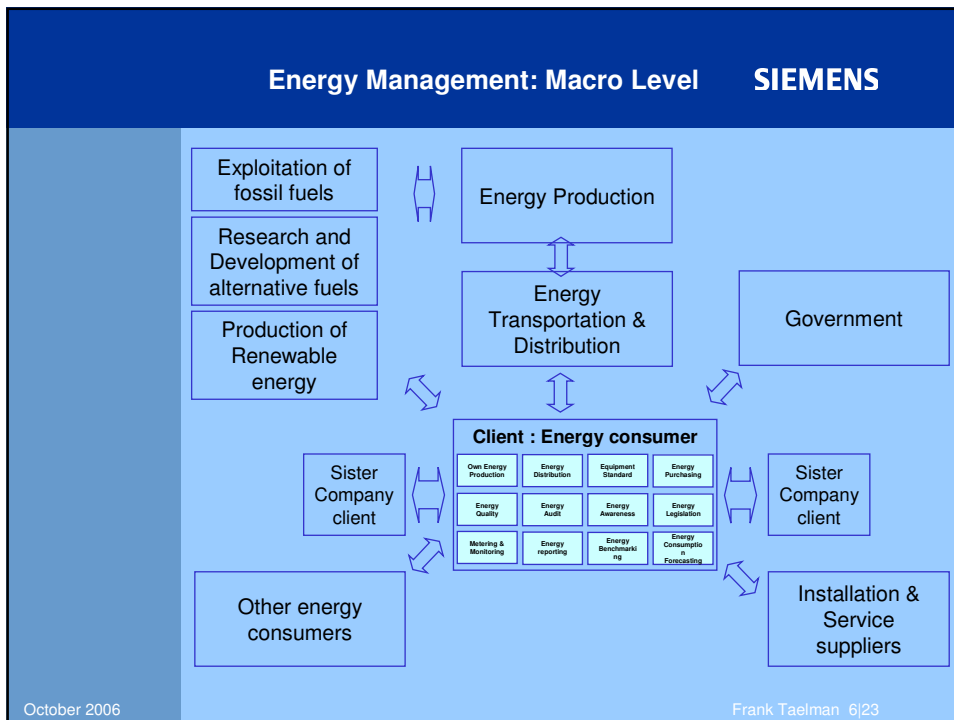
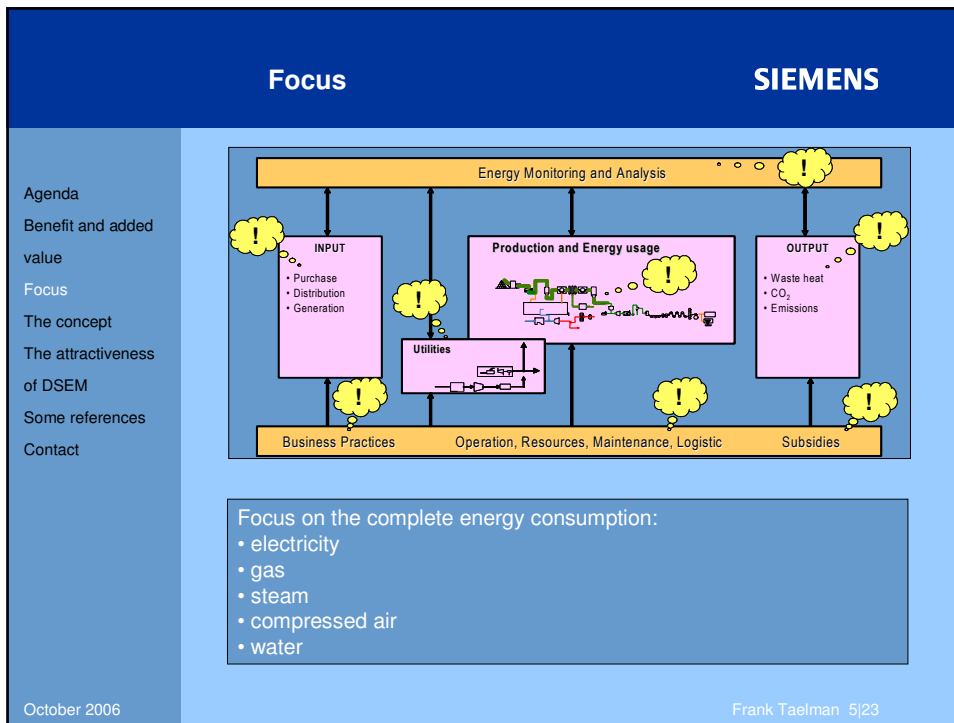
y % of the **realized** yearly energy savings from projects that are technically and economically feasible

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No performance part

Labor against fixed price
or
daily rate

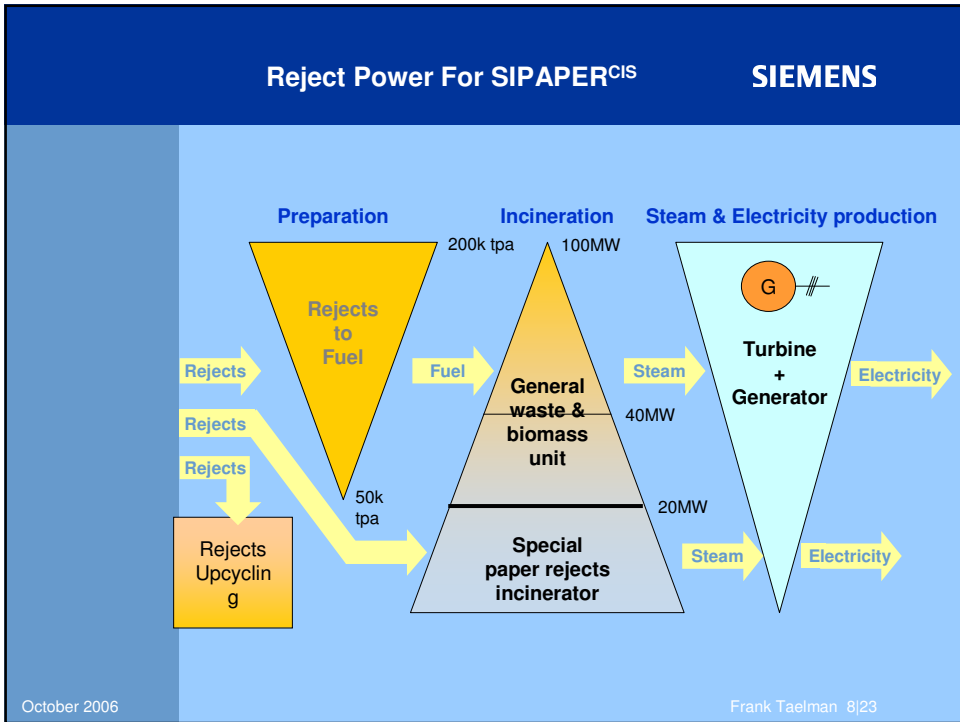
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Reject Power For SIPAPER^{CIS} SIEMENS

<p>Rejects</p>  <p>Fuel Value ~Lower Heating Value 12.000 kJ/kg (TS ~ 55%)</p>	<p>De-inking Sludge</p>  <p>Fuel Value ~ Lower Heating Value 3.800 kJ/kg (TS ~ 65%)</p>
<p>Fiber Sludge</p>  <p>Fuel Value ~Lower Heating Value 6.300 kJ/kg (TS ~ 56%)</p>	<p>Bio Sludge</p>  <p>Fuel Value ~Lower Heating Value 385 kJ/kg (TS ~ 18%)</p>

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The DSEM Concept SIEMENS

<p>Agenda</p> <p>Benefit and added value</p> <p>Focus</p> <p>The concept</p> <p>The attractiveness of DSEM</p> <p>Some references</p> <p>Contact</p>		<ul style="list-style-type: none"> • Strengths and weaknesses • Key action points • Benchmarking • Potential <ul style="list-style-type: none"> • Energy map, potential scan <ul style="list-style-type: none"> • Projects planning • Calculation of ROI <ul style="list-style-type: none"> • Project(s) execution <ul style="list-style-type: none"> • Performance and performance improvement monitoring
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Demand Side Energy Management is a concept, not a tool nor a product, in order to:

- control & minimize the energy costs
- create energy consumption transparency
- increase energy awareness & maturity level

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Step 1: Orientation SIEMENS

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Quick scan One-2-Five measures the energy management level:

- holistic method by means of yes/no answers
- the energy management & capability level is checked and benchmarked
- result: energy saving potential & critical improvement action setting

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Step 1: Real Case

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Total Energy Costs 6,854,890 €

1,680,000 € to 1,950,000 €

Pulp, Paper and Paperboard Manufacturing

Progress On Actions

Progress Report

The following table shows the relationship between Star Rating and % Achievement

Star Rating	% Achievement
★	0-20%
★★	21-46%
★★★	47-66%
★★★★	67-87%
★★★★★	88-100%

Development Progress

Diagnostic Date	Star Rating	% Achievement
February 05, 2003	1	11
January 08, 2004	2	27
May 18, 2004	3	64
December 10, 2004	4	72

5. Resourcing
Account for the human resources required to implement projects on time while planning energy management activities. Ensure this process considers the time impacts for all related activities, including project management and verification. **Achieved**

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Step 2: Energy Potential Scan

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- Analysis of total energy consumption
- List of projects with invest & saving
 - Supported by calculations & external suppliers
 - According the 6-sigma DMAIC standard



- All projects are technically feasible
 - Supported by studies, if needed, from external companies



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Step 2: Real Case (1/2)

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Concrete project list from a real DSEM project

Description	Estimated invest		Estimated yearly saving	
	Minimum	Maximum	Minimum	Maximum
Optimization of the heat exchanging process	875.000,00 €	1.250.000,00 €	680.000,00 €	850.000,00 €
Install drive for the mixer tank A	15.000,00 €	25.000,00 €	5.000,00 €	10.000,00 €
Optimization of the drive parameters for the mixer tank B	1.000,00 €	5.000,00 €	10.000,00 €	15.000,00 €
Optimization of the lighting	5.000,00 €	10.000,00 €	3.500,00 €	5.000,00 €
Optimization of the operation mode of the mixers in tanks 1 to 6	100,00 €	1.000,00 €	27.000,00 €	33.000,00 €
Correct dimensioning of pump A1Z	10.000,00 €	15.000,00 €	10.000,00 €	15.000,00 €
Install new pump 4EZx	10.000,00 €	15.000,00 €	5.000,00 €	10.000,00 €
Optimization of the compressed air generation	40.000,00 €	55.000,00 €	50.000,00 €	60.000,00 €
Optimization of the energy sent back in the net (power generation)	1.000,00 €	5.000,00 €	5.000,00 €	10.000,00 €
Optimization of the water circuit (4 pumps out)	35.000,00 €	55.000,00 €	50.000,00 €	65.000,00 €
Install drive for the mixer in pulper 1A	3.000,00 €	5.000,00 €	12.000,00 €	15.000,00 €
Install drive pump pulper 7V	1.000,00 €	5.000,00 €	5.000,00 €	10.000,00 €
Optimization of the heat exchanging in the power generation	80.000,00 €	120.000,00 €	165.000,00 €	205.000,00 €
Install drive for the mixer in pulper 3E	1.000,00 €	5.000,00 €	20.000,00 €	30.000,00 €
Automatic shutdown of the pump 4ERT5	5.000,00 €	10.000,00 €	5.000,00 €	10.000,00 €
Automatic washing of the turbine	10.000,00 €	15.000,00 €	40.000,00 €	55.000,00 €
Optimization of the operation mode of the mixers 8 and 9	1.000,00 €	5.000,00 €	25.000,00 €	30.000,00 €
Correct dimension of the degasser	10.000,00 €	15.000,00 €	10.000,00 €	15.000,00 €
Replace mechanical breaks by generators	50.000,00 €	75.000,00 €	40.000,00 €	60.000,00 €
Shutting down fan	- €	1.000,00 €	5.000,00 €	10.000,00 €

All projects are technically feasible

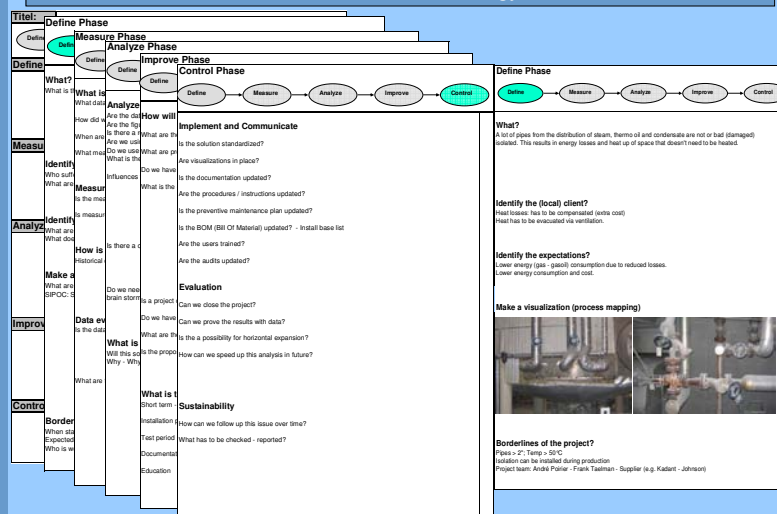
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Step 2: Real Case (2/2)

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The DMAIC methodology



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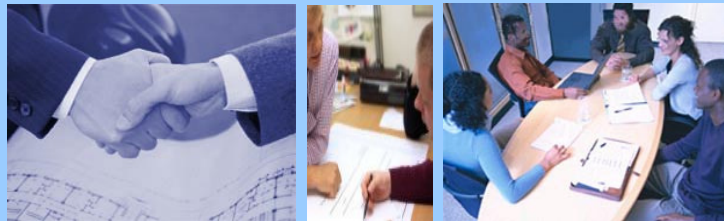
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Step 3: Planning Phase

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- Priority setting in the project detected by the EPS
- Fine-tuning of the ROI's of the high priority projects
 - Price request towards external suppliers
- Aligned planning with the production & maintenance
- Forecast of energy saving



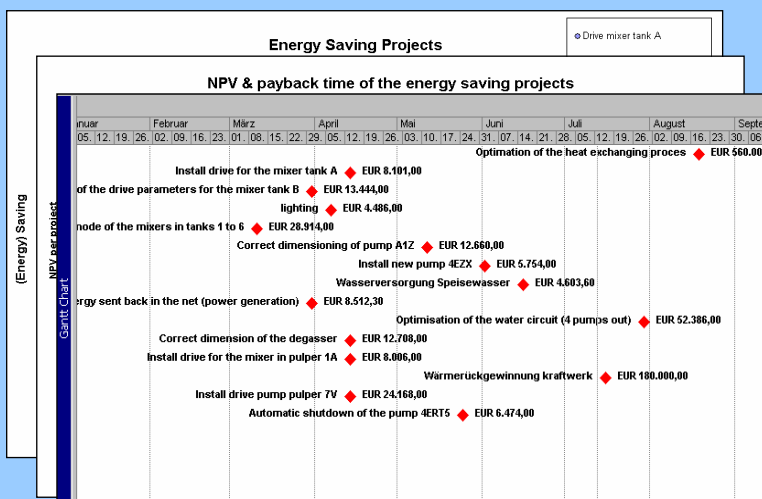
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Step 3: Real Case

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Step 4: Implementation

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Target DSEM = cutting energy, NOT selling projects

- Projects are executed by the party chosen by the customer
- Siemens can support
 - Project management
 - Coordination of external partners
 - Support of projects executed by the customer itself



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Step 5: Sustainability Phase

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- After the projects have been realized:
 - An after calculation is executed
 - The real ROI is defined
 - If this result is not in line with the expectations, corrective action will be taken
- This phase grants transparency of savings
- Metering, monitoring & reporting
 - On-line metering & monitoring systems
 - Frequent energy meeting & reporting

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The Attractiveness of DSEM SIEMENS

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- Focus especially on **reducing the energy consumption**, not only on reducing costs through negotiating energy prices, nor on selling projects or products
- **Wide focus:** not only on the board machine, but as well on power generation, monitoring, subsidies, maintenance, management, awareness, ...
- **The process:** logical, and every step adds value
- **Performance based agreement:** the risk is shared by the customer and Siemens. An optimal working relationship is needed to achieve the best results.
- **Sustainability:** through the use of Quick scan One-2-Five, the critical actions remain active until they are fulfilled.

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Cross-industry experience as added value

Type of product	Branch	Type	Duration	Savings	Country
Fruit juices	Beverage	Energy plan	15 days	225.000 EUR	Belgium
Sauces	Food	DSEM	20 days	350.000 EUR	Germany
Aluminum	Metal	DSEM	45 days	1.000.000 EUR	Germany
Packaging paper	Pulp & Paper	DSEM	45 days	600.000 EUR	UK
Image & decor	Pulp & Paper	DSEM	100 days	545.000 EUR	Canada
Decor	Pulp & Paper	DSEM	60 days	120.000 EUR	Germany
Decor	Pulp & Paper	DSEM	200 days	745.000 EUR	Germany
Coat & paint	Automotive	Energy plan	35 days	125.000 EUR	Belgium
WLC	Pulp & Paper	DSEM	330 days	1.050.000 EUR	Germany
Soya milk	Beverage	DSEM	220 days	750.000 EUR	Belgium
test liner	Pulp & Paper	Pump & fan study	10 days	20.000 EUR	Belgium
Board & test liner	Pulp & Paper	One-2-Five	5 days		Netherlands
Car	Automotive	One-2-Five	5 days		Belgium

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