Agenda

- Introducing Siemens
- Energy Management & Siemens
- Totally Integrated Energy Management Solutions
- Best practice and key success in
  - Demand Side Energy management
  - Waste2Energy
  - Power generation
  - Energy distribution
Siemens’ global presence
basis for competitiveness

As of September 30, 2006

<table>
<thead>
<tr>
<th>Region</th>
<th>Employees (thousands)</th>
<th>Sales (billions of EUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Americas</td>
<td>104</td>
<td>22.9</td>
</tr>
<tr>
<td>Europe (excl. Germany)</td>
<td>127</td>
<td>27.1</td>
</tr>
<tr>
<td>Germany</td>
<td>161</td>
<td>16.2</td>
</tr>
<tr>
<td>Asia-Pacific</td>
<td>13</td>
<td>8.2</td>
</tr>
<tr>
<td>Others</td>
<td>13</td>
<td>4</td>
</tr>
</tbody>
</table>

As of September 30, 2006

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Active in six business areas

External sales of Operations Groups excluding Other Operations (as of September 30, 2006)

- Automation and Control
- Power
- Transportation
- Medical
- Information and Communications
- Lighting

Automation and Drives
Power Generation
Transportation Systems
Medical Solutions
Communications 1)
OSRAM

Industrial Solutions and Services
Power Transmission and Distribution
Siemens VDO Automotive
Siemens IT Solutions and Services 2)

Siemens Building Technologies

28.5% 19.3% 17.3% 9.8% 19.7% 5.4%

1) Represented by Siemens Networks GmbH & Co. KG and Siemens Enterprise Communications GmbH & Co. KG as of October 1, 2006.
2) Siemens Business Services (SBS) Group until January 15, 2007
Energy management is a main focus for Siemens

**People Excellence**
- Develop talent globally
- Strengthen leadership development
- Attain high performance culture
- Strengthen expert careers

**Portfolio**
- Build on our strengths in
  - Energy & Environmental Care
  - Automation & Control, Industrial & Public Infrastructures
  - Healthcare
  - IPO of Siemens VDO

**Operational Excellence**
- Execute Siemens Management System (powered by top*) with focus on
  - Innovation
  - Customer Focus
  - Global Competitiveness

**Corporate Responsibility**
- Achieve best-in-class in
  - Corporate Governance
  - Compliance
  - Climate protection
  - Corporate Citizenship

**Performance**
- Optimize capital efficiency with ROCE of 14–16%
- Attain cash conversion rate of "1–growth rate"
- Sustain 2x GDP growth
- Achieve new margin ranges

**Fit 4 2010**

**Code of Ethics and Conduct - Values**

**Performance**

**People Excellence**

**Portfolio**

**Operational Excellence**

**Corporate Responsibility**

**Benchmark in Transparency and Compliance**
Portfolio Harmonization: Totally Integrated Energy Management

Focus

Project execution & Project mgt

Purchasing

Generation

Distribution

Consumption

Emission

Purchasing: Power plant solutions

Generation: Wind / Solar / fuel cells geothermal

Distribution: Power transport solutions

Consumption: Waste to Energy

Emission: Heat recovery

Energy availability & quality solutions

Energy integrity check

Not interruptible power supply

Energy reduction solutions

Energy forecasting

Energy production cost reduction program

Peak shaving & load shedding

Drives & motor program

Demand Side Energy Management

Energy performance contracting

Energy Management support solutions

Metering, monitoring & reporting

Energy Management support & creation of awareness

Training

Subsidy support
Best practice and key success in:

Demand Side Energy Management
Best practice: Demand Side Energy Management Approach

The issue:
- How to define the ideal energy saving process in an industrial plant?
- How to efficiently scan a plant on the energy saving potential?
- How to make the outcome of an energy saving project sustainable?
- How to increase the energy management maturity level of an industrial plant?

The solution’s background:
- Based on extensive research & development of concrete best available techniques and in class examples
- Based on the cross-industry synergies between metals, pulp & paper, chemistry, food & beverage and buildings
- Based on the continuous improvement principles

The solution:

<table>
<thead>
<tr>
<th>Phases</th>
<th>Awareness</th>
<th>Analysis</th>
<th>Feasibility</th>
<th>Implementation &amp; Sustainability</th>
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<td>Energy Improvement</td>
<td>Potential Estimation</td>
<td>Energy efficiency measures</td>
<td>Realization Concept, ROI and Feasibility</td>
<td>Technical Realization Verification</td>
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...Decision point
References world wide, in various industries

- Energy Improvement
- Potential Estimation
- Energy efficiency measures
- Realization Concept, ROI and Feasibility
- Technical Realization Verification

Images of various industrial facilities.
Best practice and key success in:

Waste 2 Energy

Wasted Heat Recovery
Solution to be used anywhere where heat is produced!

- Iron & Steel
- Glass
- Aluminum
- Marine
- Cement
- Diesel Generators
- Oil & Gas
We will utilize the waste heat either from a liquid source or from the flue gases of your process to produce electrical energy.
Experience from FujiOil Hydrocarbon facility (Japan)

- Waste heat in a hydrocarbon plant
- Kalina-based, Operational since September 2005
- 3,9 MW electrical power output, measured power corresponds to Heat Balances
- Availability nearly 100%
- Built by Chiyoda / Recurrent Engineering
“Gudrun Maersk”
First vessel with a high efficiency Waste Heat Recovery plant in service since June 2005

- Power output: 6 MW from Waste Heat Plant
- Length of ship: 367.28 m
- Ship’s Main engine: 12RT-flex96C; 68’640 kW

- **12 M-class vessels** built between 1988 -1991 with more than 1.500.000 operating hours with 3,5 MW power output

- **6 L197 series** – five vessels are already in operation with 6MW power output

- **Combined Cycle Power Plants**

Using the waste heat from gas turbines increases the total efficiency of the power plant. Several power plants around the world have been designed with this application to generate additional power from the available heat.
Best practice and key success in:

Waste 2 Energy

Rejects in Pulp & Paper Industry
Reject Power for SIPAPERCIS
Present situation

- **PAPER**: Fibers for paper production (95%)
- **REJECTS**: Mixture of various components which cannot be used for papermaking (5%)
- **Recovered Paper**
- **Waste**
Reject Power for SIPAPERCIS

Ideal situation

ORGANIC
- Fibers for paper production
- Fuel Part (Synthetic foil, Styrophor, water resistant paper, textile, wood, ..)

INORGANIC
- Glass
- Ferrous
- Non-Ferrous

INERT
- Non recyclable components

95%
Paper

4%
Fuel
- Glass 0,1%
- Ferrous 0,3%
- Non-Ferrous 0,1%

0,5%
Inert

= 99,5% Recycling!
Reject Power for SIPAPERCIS
Energy Center for Reduced Production Costs

Bio gas from anaerobe

Bio-sludge

Power Generation

Reject Power

Rejects; Fiber sludge

Boiler
Rofire installation  
(SK Roermond-The Netherlands)

- Integrated in paper mill
- Processes all solid waste of the paper mill
- Produces coal like pellets usable as fuel in i.e. Cement kilns
- Process designed by Siemens and Stamicarbon
Reject Power installation (MM Hirschwang-Austria)

- Dedicated solution for the paper industry
- Integrated in paper mill
- Processes all waste of the paper mill
- Produces steam and electricity for the paper mill
- Flue gas cleaning based on Best Available Technologies
Reject Up cycling Installation
(CDEM Duiven-The Netherlands)

- Can be integrated in paper mill
- Can process up to 220,000 tons of deinking sludge
- Results in a cement like product and steam/electricity for the mill
- Thermal treatment of deinking sludge's resulting in a mineral conversion
- No remaining ashes
- Clean process resulting in almost no emissions
Best practice and key success in:

Power Generation
Cost reduction Program
Burgo Ardennes Project
Complex Process require expert system
Best practice and key success in:

Energy Distribution
The System Environment – an Integrated Offer
Integrated Power Distribution for Commercial Buildings and Industry

Totally Integrated Power combines every aspect of power distribution into an integrated entity
- in all commercial and industrial buildings
- for the supply of industrial production lines
- from medium-voltage down to socket outlets

This integration offers economic advantages during the entire project cycle
- from the investment decision
- to planning
- installation
- and use/operation

for investors and users
Totally Integrated Power
The Portfolio comprises ...

- **Software tools** for quick and safe dimensioning of power distribution

- Type-tested, compact and zero-maintenance **medium-voltage switchgear** for reliable power supply

- High-capacity, energy saving **power transformers** of low flammability for economic long-term use

- A complete **busbar trunking system** as a cable substitute with low fire load and high flexibility in case of utilization modification

- Type-tested, **low-voltage panel- & switchboards** with communication capable switchgear for interfacing to general control systems

- A comprehensive and integrated **building automation system** to optimize operating costs

- **Switches and outlets** that are strong in design and rich in variation with high-convenience interfacing to bus systems
Investors Increase their Return on Investment (1)

... by cost saving in the procurement of products and systems for power distribution

- Dimensioning tool SIMARIS design ensures optimal sizing of the electrical power distribution system
- Over-sizing is avoided
- A combination of different operating strategies can be considered in the dimensioning process
- Power reserves can be considered to ensure uninterrupted operation account for possible system extensions
- Simulating various scenarios of use is feasible as early as in the preplanning stage
Investors Increase their Return on Investment (2)

... by small space requirements for the electrical infrastructure

- Extra compact products and systems, such as gas- and air-insulated medium-voltage switchgear help to save space in the building
- Type-tested switchgear allows for maximum mounting density of the products at maximum safety
Investors Increase their Return on Investment (3)

... by securing the return on investment over a long period of time due to a high attractiveness for the tenant

- Standard bus systems connect functions for room climate control and other, such as HVAC, lighting or shading, as well as the power generating sets themselves
- Energy savings options ensure economical operation
- Comfortable room functionalities boost the estate’s attractiveness
- Changes of building use can be implemented in a cost-effective way
Users/Building Facility Managers reduce their operating costs (1)

... and improves the plant/system availability

- Power Management with SIMATIC powercontrol creates transparency of power consumption and plant/system state
- The interfacing of the power supply units to bus systems provides the necessary data
- Improved plant/system availability e.g. through early detection and repair of critical system states
- Purchase contracts with power supply companies can be optimally negotiated
Users/Building Facility Managers reduce their operating costs (2)

... by a high degree of operational safety and by interfacing power distribution to building management or process control systems

- Central operator control & monitoring helps to reduce downtimes
- This reduces costs arising from losses in production and services
- When a selective design is chosen, protective tripping on fault will only disconnect the units involved
- Modular systems can be easily and quickly replaced
Users/Building Facility Managers reduce their operating costs (3)

... while maintaining a high degree of flexibility, when the building’s use is changed

- Due to low expense in case of changes in the building use or demand adjustments
- Interactive room and energy management functions can be adapted to new variants of use with the existing equipment, equipment changes become unnecessary
- Power distribution systems can be modularly extended
- Dimensioning tool SIMARIS design permits to simulate different scenarios for an intended change of building use
Selected References of Different Branches
Eco Print Center: the building (Lokeren/Belgium)
Who is ‘De Persgroep Publishing’ and EPC?
Eco Print Center: the concept

- Eco ? Waterless printing!
- Rainwater used for sanitary applications.
- Heat recuperation:
  - Dryer
  - Ventilators
  - Kompressors
- Wind mill
- Light on/off with sensors (Instabus EIB from Siemens)
- Building management system (Desigo from Siemens)
- Power Management System (Simatic Powercontrol from Siemens)
- Energy Distribution (Totally Integrated Power from Siemens)
Thank you for your attention!

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