Energy Efficiency Jobs & Policy Needs

Economic Impacts of Energy Efficiency Policies and Investments
2011

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VP Government Affairs
Schneider Electric – the global specialist in energy management

21 billion € sales (last twelve months)

38% of sales in new economies (last twelve months)

120,000+ people in 100+ countries

4–5% of sales devoted to R&D

Balanced geographies – H1 2011 sales

North America 23%
Western Europe 33%
Rest of World 18%
Asia Pacific 26%

Diversified end markets – FY 2010 sales

Utilities & Infrastructure 20%
Industrial & machines 24%
Data centres 17%
Non-residential buildings 30%
Residential 9%

On a comparable basis with 12- month of Areva D
Schneider Electric USA

- 17,000+ employees
- Sales of $6B+ in 2010
- 40 manufacturing facilities,
- 6 distribution centers,
- 6 R&D centers
EE.... A new opportunity?

EE is not new....

.... but it is underutilized

What is available in EE?

Studies by ACEEE and others suggest that the United States can cost-effectively reduce energy consumption by 25-30% or more over the course of the next 20-25 years.

- From 1970 to 2008 US EE gains met 75% of new energy demands
- New energy supply contributed only 25% demand

Source: Laitner 2008
The Global Specialist in Energy Management

Energy production & transmission

- Wind energy
- Solar energy
- Hydro
- Biofuels
- Hydrocarbons
- Nuclear

Energy Management

Making energy...
- Safe
- Reliable
- Efficient
- Productive
- Green

Energy Usage

- Appliances
- Climate control
- Security
- Lighting
- Machines
- IT servers

...with 30-70% savings everywhere
Chiller compressor control optimization

Solution in brief
- The chiller compressor is automatically controlled through a variable speed drive and a PLC.

Value proposition
- Up to 20% energy savings thanks to a dedicated control software.
Small Building Energy Management

Energy Management Solution for small/medium buildings

- Monitoring & control solutions reduce consumption
- Energy reporting data supports compliance and certification requirements.
- improves electrical installation operation and maintenance, hence reducing OPEX.
- helps increase property value, maximize asset value and ease selling/renting.

Value Proposition
- Up to 20% energy savings thanks to a dedicated control
Power Usage Effectiveness Solution for Data Centers

- Integrated rack, power and cooling systems for data centers

- Decrease your data center’s PUE measure by up to 25%
Logistic Centers Energy Management

• *Specialized convoyer control solutions*
  • *Optimization of energy required*
  • No reactive energy consumed.
• Up to 50% energy savings in operating mode.
School recaptured 42% of investment in the first year

**Situation**
- 200,000 square foot private school in Houston, TX
- Energy costs had increased 30% in two years
- Wanted to go green

**Challenge**
- Administrators would only approve going green—if also financially attractive.

**Solution**
- Energy Performance Contract for
  - Optimized HVAC
  - Lighting retrofit
  - Utility bill optimization

**Results**
- $101,667 projected annual energy savings
- 42% return on $240,000 capital investment in the very first year—even without energy rebates or incentives.
Energy Savings Performance Contracting (ESPC)

How ESPCs Work

- **Before ESPC** - Federal government spends too much on utilities and O&M costs
- **During ESPC** - Energy service companies finance, install and maintain new energy efficient equipment, at no upfront cost to government (e.g. lighting, boilers, chillers, etc.)
  - Savings are guaranteed
  - Government pays back private sector investment with utility savings
  - By law government pays no more than it would have paid for utilities before ESPC
- **After ESPC** - Government keeps all the savings after investment is paid off

Government Benefits of ESPC

- Saves energy & money
- Upgrades federal facilities
- Creates jobs
- Reduces emissions
- Guaranteed results
- No additional money needed – cost is paid out of savings
- A win-win program
Perspectives & Challenges

What we see
Energy is invisible.
We need to make it visible!

Benchmarking shows opportunity exists
……in high tech facilities energy intensity varies significantly

<table>
<thead>
<tr>
<th>Comparative Energy Costs</th>
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<tbody>
<tr>
<td>High-Tech Facilities vs. Standard Buildings</td>
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<table>
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<tr>
<th>Annual Energy Costs ($/square foot)</th>
</tr>
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<tbody>
<tr>
<td>School</td>
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<tr>
<td>0</td>
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</table>

Integrated connectivity gives insight
…. In Data Centers Energy Dashboards allows optimize management

Data Center Efficiency Calculator
Impact of alternative power and cooling approaches on energy costs.

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<table>
<thead>
<tr>
<th>INPUTS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Data center capacity</td>
<td>1000</td>
</tr>
<tr>
<td>IT load</td>
<td>0.12</td>
</tr>
<tr>
<td>Electricity cost per kWh</td>
<td>0.12</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Options</th>
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<tbody>
<tr>
<td>UPS systems</td>
<td></td>
</tr>
<tr>
<td>Power redundancy</td>
<td>Single phase power</td>
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<tr>
<td>Cooling systems</td>
<td>chilled water</td>
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<tr>
<td>Chiller</td>
<td>Chiller with cooling tower</td>
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<tr>
<td>Air distribution</td>
<td>Standard cooling</td>
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<tr>
<td>CRAC/CRFH redundancy</td>
<td>Single phase CRAC/CRFH</td>
</tr>
<tr>
<td>Heat rejection redundancy</td>
<td>Single phase heat rejection</td>
</tr>
<tr>
<td>Lighting</td>
<td>Typical lighting</td>
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</tbody>
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Data center infrastructure efficiency (DCE): 52.6%
Annual electricity cost: € 1,592,580
```

Efficiency curve

Schneider Electric - Division - Name – Date
Labeling is Still confusing

- Need to be clear on different labels and their proposes
  - operational versus asset rating
  - Technical versus statistical
- Need consistency between competing systems
  - Many competing labeling systems in market today
  - Many evolving
Our Perspective on Inhibitors

● Market Inhibitors
  ● Low awareness and inadequate skills
  ● Limited incentives for designers and builders
  ● Comparative usage understanding

● Technology Inhibitors
  ● Systems level solutions/integration
  ● Measurement & verification

● Financing Inhibitors
  ● Incentive misalignment
  ● Limited or inadequate financing

● Regulation
  ● Inconsistent implementation of compliance with codes & policies
  ● Inconsistent & immature policies
  ● Inconsistent utility engagement across states
What is needed?

- Policy intervention where market barriers or failures inhibit optimal investment in EE
  - Misplaced incentives such as the landlord tenant relation in buildings
  - Distorted regulations – utility engagement in distributed generation or demand response programs.
  - Unpriced costs & goods – environmental costs, education, training, research

- Assessment of the impact and effectiveness of current policies and regulations. – Many things work today but are underutilized
  - State code programs – only two states require most current codes
  - Utility programs - decoupling, EERS,
  - Equipment standards – energy star,

- Putting policy and regulation at the right place.
  - Federal, State, Local
Make the most of your energy