Energy Efficiency in Residential

How to save Energy in Home Control applications?

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Schneider Electric and Energy Efficiency

- Energy Efficiency (E²) is an important concern for our Company
  - Global Warming: is one of the most critical problem ever faced by mankind
  - “Green” pressure: new regulations forces us to improve our offer
  - Energy costs: continuous increase changes the business rules.
  - It's a real Business Opportunity: Energy Management needs control products (sensors, actuators, controllers) and added value services.

- The existing offer can already contribute to save Energy at Home
  - Existing offer of Stand Alone Electronic products (SAE) contribute already to Energy Management and Energy Savings
    - dimmers, timers, movement/presence detectors, switches, controllers, etc

- Schneider Electric is taking in account Energy Efficiency in its coming Integrated Solutions for Residential
  - Residential Gateways and Network integrated systems will allow more sophisticated Energy Management as well as support for added value services for the End User
    - Extended communication capabilities, advanced control and remote access will allow fine tuning Energy Management at home
Major drivers in Home Automation Applications

- **Comfort and Convenience**
  - Electrical Appliances controls: Lighting, Temperature, Shutter
  - Scene Management: what you want in “One Touch”
  - Remote control: control from where you are

- **Safety and Security**
  - Technical Alarms: smoke detectors, leakage detectors, window detector...
  - Access Control: Door Entry systems, Video Monitoring and Gate Control
  - Security and Video: intruder alarms, CCTV

- **Entertainment & Communication**
  - Broadband Connectivity and distribution: Internet, TVoIP, VoIP, etc...
  - Digital A/V Content Delivery: watch anything, anywhere, anytime
  - Remote access thru the Web or your Mobile Phone

- **Energy Efficiency**
  - Energy Management and Energy Savings
  - Mainly in Lighting and Temperature Control (Heating/Cooling)

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Home Automation Applications and Needs

### Drivers
- Lighting Control
- Climate Control
- Ventilation Control
- Weather stations
- Irrigation
- Voice on IP
- Video on IP
- WEB access
- Digital Audio Distribution
- Digital Video Distribution
- Leakage detectors
- Wind detectors
- Health Care

### Functions
- Shutter/Curtain Control
- Room occupancy
- Pool management
- IP webcams
- Intruder Alarms
- Access Control
- Remote Monitoring
- Gate Control
- Parking Control
- CCTV
- Measurement
- Smoke/Gas Detectors
- Emergency Lighting

### Values
- Desirable
- Usable
- Useful
- Affordable
- Reliable
- Available
- Scalable/Extensible
Climate and Lighting control are the main domains for the energy efficiency value

- Average breakdown of energy consumption

<table>
<thead>
<tr>
<th></th>
<th>Residential</th>
<th>Office</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heating &amp; cooling</td>
<td>60%</td>
<td>14%</td>
</tr>
<tr>
<td>Lighting</td>
<td>14%</td>
<td>16%</td>
</tr>
<tr>
<td>Electrical appliances</td>
<td>14%</td>
<td>10%</td>
</tr>
<tr>
<td>Hot water sanitary</td>
<td>13%</td>
<td>9%</td>
</tr>
<tr>
<td>Others</td>
<td>0%</td>
<td>11%</td>
</tr>
</tbody>
</table>

- In Other buildings, main sources of consumption are:
  - Lighting or Space Heating / Cooling depending on building
  - Water heating come first in Lodging and Healthcare buildings.

Solutions to Control Energy

- Stand Alone Electronic devices
  - **Sensors:**
    - Movement/presence detectors, twilight switches, Temperature probes ..
  - **Actuators:**
    - Power switches, motor control devices, thermostats, load shedders, ...

- Control Systems
  - **Controllers and Residential Gateway :**
    - IHC controller, Premise Gateway
  - **Control Networks:**
    - Wired: KNX, C-Bus, IHC ...
    - Wireless: C-Bus RF, Airlink, Connect, ...
  - **User Interfaces ;**
    - Remote Controls, DLT, touch screens, PDA, ...

- Or a combination of both
Energy Efficiency in Residential

- Climate control and lighting control are the most energy consuming functions at home
  - Heating, Cooling, Ventilation and Lighting

- Schneider Electric can already provide a large set of solutions to reduce drastically the Energy consumption

- Customer benefits
  - Maximize your Energy savings while keeping Comfort and Safety and Security at home
  - SE solutions are scalable and flexible enough to be used in new constructions as well as for retrofit, renovation or extension of existing applications
  - One stop shopping: as a specialist of Electricity, we are able to provide complete and consistent solutions with a high level of support worldwide
    - Including WD, VDI, Control and Power products

Energy Efficiency in Lighting Control

- How to reduce unnecessary lighting time?
- How to manage properly the lighting level according to the outside brightness (Daylight Harvest)?
- How to create optimized lighting level in different parts of the building or house according to the level of activity?
- How to increase comfort along with Energy Savings?
- How to control and visualize the Energy Savings for the user?
Energy Efficiency in Climate Control

- How to reduce unnecessary Heating/Cooling time?
- How to manage properly the temperature level according to the outside temperature?
- How to create optimized temperature level in different parts of the building or house according to the level of activity?
- How to increase comfort along with Energy savings?
- How to control and visualize the Energy Savings for the user?

Some Energy Saving Tips

- Schneider Electric solutions at the room level
  - Install timers and/or movement detectors wherever applicable to switch off unnecessary lighting in unoccupied areas
  - Install appropriate dimmers to adjust lighting level according to room activity
  - Install occupancy sensors to automatically switch on and off air conditioning system (heating/cooling)
  - Install thermostats and temperature regulation systems wherever applicable
  - Install Shutter/Blind/Curtain control systems to make use of daylight whenever possible
  - Use Scene Management capabilities to adjust light and temperature to save Energy while keeping a high level of comfort

- Schneider Electric solutions at the Home level
  - To maximize savings, combine your energy efficiency applications at the Home level (house or apartment) ! Install intelligent controllers (Residential Gateway)
    - for a fine tuned Energy Management at Home including lighting, temperature, shutter control as well as load management (load shedding) and energy consumption metering and monitoring
    - adding Remote Control capabilities through the Web or your Mobile Phone
    - Providing sophisticated algorithms to optimize energy savings while increasing comfort, safety and security

Overall energy saving of up to 60% through appropriate control at the house/apartment level is achievable!
Standalone applications at home:
Dimming

- Give users the means to adapt lighting level to their needs i.e. currently performed tasks and location at home.

- Products
  - Dimmers

- Potential savings
  - 8 to 16%

Standalone applications at home:
Presence / Movement detection

- Infrared detectors trigger lights when people are present or passing by

- Products:
  - Movement detectors
  - Presence detectors

- Potential savings
  - 10 to 20%
Standalone applications at home:
Scheduling

- A whole house/apartment does not need to run on 100% comfort setting if only a few occupants are in a given area.
  - Zone scheduling allows predefined sections of a house/apartment to have lighting level reduced or shut down on a hourly / daily / weekly schedule

- Products
  - Timers, Controllers

- Potential savings
  - 20 to 40%

Home Automation Market trends

- High Speed Internet penetration is growing fast
- IPTV and Digital A/V entertainment are strong market drivers in terms of attractiveness
- Customers are expecting more and more functionality
Our vision of The Home Automation Solution Architecture

- Connect our Electrical Appliances control world to the IP world
- Access to most popular IP applications through Partnerships/Acquisitions

Example of what’s coming in 2008

- The fully integrated Home Automation solution:
  - A first step towards Integrated and Connected Smart Homes
  - A Home Automation Gateway linking the Electrical control world and the IP world
  - Based on open standard platforms for a worldwide use with regional adaptations
    - Common HW Core Platform
    - Common Graphic User Interface SW and firmware
  - Targeting a full coverage of all Customer requirements scope including:
    - Comfort and Convenience: lighting, temperature, shutter control and scene management
    - Safety and Security: technical alarms, video monitoring, access control, IP based door entry systems, ...
    - Digital A/V entertainment: A/V distribution, content management and A/V devices control
    - Energy savings applications
Schneider Electric Solutions for Residential
Rapid $E^2$ gains with standalone equipment

- For rapid $E^2$ gains at home
  - We already provide standalone equipment, with various shapes and designs suited to technical and architectural requirements
  - We will provide fully integrated Solutions based on Residential Gateways and networked applications

- A broad portfolio of standalone products
  - Lighting control: dimmers, twilight switches
  - Presence/Movement detection: PIR’s
  - Time control: time switches, timers
  - Temperature regulation: thermostats
  - Shutter control: power units
  - Load shedding: Load shedders

- Through our Major brands in various countries
  - Clipsal, Merten, Merlin Gerin, …

Conclusions

- The 3 main messages
  - Sell today Energy Efficient homes
    - The existing offer, and particularly our Stand Alone Electronics catalog, is able to provide TODAY significant energy savings at home with very simple applications
  - Keep it Smart and Simple (KISS)
    - Simple basic applications can save a lot of Energy
      - A simple movement detector can save up to 20% in unoccupied areas
      - Combination of basic applications can save even more!
  - Go for “Integrated Solutions”
    - Including Control, SAE, WD, VDI and Power products, is a way to provide to your customers attractive, complete and consistent Solutions to cover their needs
    - Integrated solutions provide optimized Energy Efficiency covering all fields of applications (lighting, closing, climate control) while preserving Comfort, Safety and Security for the End User
Thanks for your attention

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