Public Building Managers and the Local Energy Transition

Financial tools to support energy savings and CO₂ reductions from buildings

EFFECT4buildings
Marit Ragnarsson October 29th 2019
→ 40 % of energy consumption and 36 % of CO₂ emissions in the EU from buildings

→ Sustainable, energy efficient and climate proofed buildings are needed to achieve a climate-neutral Europe by 2050

→ Less than 3% of the building stock in the EU qualifies the A-label = 97% of buildings in the EU need to be upgraded
Target group: Building managers

Situation of today:
- Energy and climate goals
- Aware of potential energy savings
Target group: Building managers

Situation of today:
- Energy and climate goals
- Aware of potential energy savings

BUT
- Decision makers has to be convinced
- Limited human resources, large responsibility
- Limited financial resources
- Not allowed to take risks
- Not knowledge of all technology solutions
- Conservative sector
EFFECT4buildings solution:
Development of financial tools and instruments

- Bundling
- Financial calculations
- Prosumerism
- Green leasing contracts

TECHNOLOGY SOLUTIONS

- Energy Performance Contract
- Funding
- Multi Service Contracts
- + Trainings and policy recommendations
Technology solutions

1. Solution providers
2. Knowledge of solutions
3. Knowledge of potential savings
4. Verification from other building managers
5. Investment decision

Feedback on experience to solution providers
Financial calculations

Excel tool

Web tool
<table>
<thead>
<tr>
<th>Investment</th>
<th>Cost</th>
<th>Pay back time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solution A</td>
<td>100 000</td>
<td>5 year</td>
</tr>
<tr>
<td>Solution B</td>
<td>100 000</td>
<td>8 year</td>
</tr>
<tr>
<td>Investment</td>
<td>Cost</td>
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</table>
### Presentation of measures in energy audits

<table>
<thead>
<tr>
<th>Process</th>
<th>Measure</th>
<th>Savings [kWh/year]</th>
<th>Investment cost [€]</th>
<th>Payback time [year]</th>
<th>Net present value [€]</th>
<th>Internal rate of return</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building</td>
<td>Building 6: Apply an extra insulated glass unit on specified windows and decrease the transmission losses.</td>
<td>14 800\textsubscript{n, gas}</td>
<td>550</td>
<td>7,3</td>
<td>1 000</td>
<td>11 %</td>
</tr>
<tr>
<td>Building</td>
<td>Building 7: Construct a well-insulated wall that replaces specified windows and decrease the transmission losses.</td>
<td>25 800\textsubscript{n, gas}</td>
<td>990</td>
<td>7,3</td>
<td>3 000</td>
<td>12 %</td>
</tr>
<tr>
<td>Building</td>
<td>Building 7: Repair broken window and decrease the transmission losses.</td>
<td>3 500\textsubscript{n, gas}</td>
<td>130</td>
<td>2,0</td>
<td>1 000</td>
<td>50 %</td>
</tr>
<tr>
<td>Building</td>
<td>Seal industrial doors in Building 2 and 7.</td>
<td>42 000\textsubscript{n, gas}</td>
<td>1 550</td>
<td>0,3</td>
<td>10 000</td>
<td>310 %</td>
</tr>
<tr>
<td>Lighting</td>
<td>Converting from T8 fluorescent tubes to T5 in production areas, building 3 and 12.</td>
<td>51 400\textsubscript{el}</td>
<td>4 900</td>
<td>2,9</td>
<td>18 000</td>
<td>32 %</td>
</tr>
<tr>
<td>Lighting</td>
<td>Converting from T8 fluorescent tubes to LED tubes and ECO/ES in specified premises.</td>
<td>42 200\textsubscript{el}</td>
<td>4 250</td>
<td>3,7</td>
<td>13 000</td>
<td>24 %</td>
</tr>
<tr>
<td>Ventilation</td>
<td>Sand blasting: equip fan motor with a variable frequency drive, VFD.</td>
<td>25 000\textsubscript{el}</td>
<td>2 200</td>
<td>2,3</td>
<td>10 000</td>
<td>43 %</td>
</tr>
</tbody>
</table>
Bundling into a "package deal" make more investments profitable

- Recover heat from Kaeser ASD 37 T
- Seat industrial doors
- Recover heat from Kaeser Airtower 19
- Equip fan motor with a VFD for sand blasting
- Convert from T8 fluorescent tubes to T5
- Invest in a compressor with VSD
- Repair broken windows
- Construct a well-insulated instead of windows
Funding

- Mapping funding possibilities and helping building managers apply for new funding
- Sharing experience from different funding sources
- Policy recommendations for European Regional Development Fund
- Promoting private funding sources and private-public partnership
  - EPC
  - Advantageous green energy bank loans
  - Bonds and Financial institutions
Energy Performance Contracting, EPC

- Model for implementation of EE measures with guaranteed results
- Energy savings cover investment costs
- Outsourcing of technical and financial risk
- Turnkey enterprise
- Can include financial support scheme

Advantages for building owner
- Low risk
- Many EE measures in short time
- Upgrading of building mass
- Increase competence

**Bonus tool:**
Energy performance maintaining contracts
We spend 90% of the time indoor

- A good indoor climate increases health and productivity

Planing for both energy savings and better indoor climate

- Adds more value to investment money (e.g., increased building value, lower maintaining costs, longer lease, more satisfied tenants)

**EFFECT4building develop planning tool:**

- Guidebook, criteria and evaluation parameters
Green Leasing Contracts
Between building owner and tenant

Energy efficiency and environmental responsibility through collaboration between owners and users

- Exchange of information
- Follow up on energy use
- Common goal
- Action plan
- Commitment to environmental and energy use
- Incentives, rewards
Prosumerism

General knowledge

Planning
Optimization of size and procurement tool, selling overproduction, permits, legal rules

Technology

Economy
Financial calculation tool, funding, business models

Smart grid
Make better use of solar energy by
- increase need for electricity
- move the power requirement in time
  - storage
  - power outlet optimization
- transfer electricity to other buildings
Convincing decision maker tool

1. Present value proposition

1. Offer support / solution

1. Agreement (contract) decision

Integrating outcome to strategies. Get credit!
Interreg Baltic Sea Energy Platform - CAMS

**EFFECT4Buildings**, LowTemp, AREA 21, Co2mmunity, Act Now, BEA-APP, RDI2CluB
HORIZON 2020’s HERON, SIM4NEXUS, ENLARGE, ARCEE

- Capitalization of results from energy projects
- Improving energy auditing in buildings, by standardized methods and database
- Qualification program on housing refurbishment
- Create synergy between energy efficiency and climate adaptation
  Policy recommendations and guidance for climate-proofing of buildings
Thank you!

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