



**Project information**

|                              |                      |
|------------------------------|----------------------|
| Project type:                | ECO-rehabilitation   |
| Address:                     | Birkedalsvej 27      |
| End renovation year:         | 2009                 |
| Building type:               | Office building      |
| Storeys:                     | 3                    |
| Persons in building:         | 180/330              |
| Gross area BTA new building: | 496 m <sup>2</sup>   |
| Gross area BTA old building: | 9,119 m <sup>2</sup> |
| Total eligible costs:        |                      |
| Total costs:                 |                      |

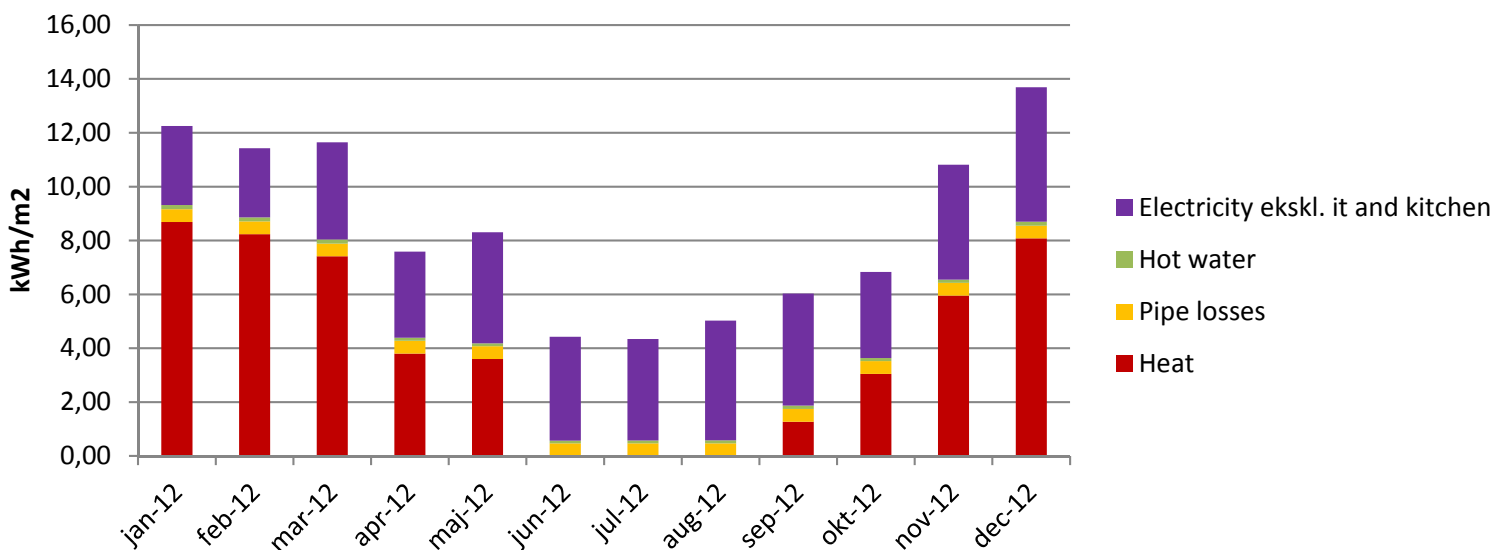
**Special ECO-technologies applied:**

- Energy optimisation of lighting
- Lighting control with PIR sensors
- Heating control
- Sub meters on cooling installations
- Extra insulation
- Optimization of ventilation system
- Air tightness
- Low energy pumps
- Installation of floor heating
- Low energy glass façade



**Energy consumption**

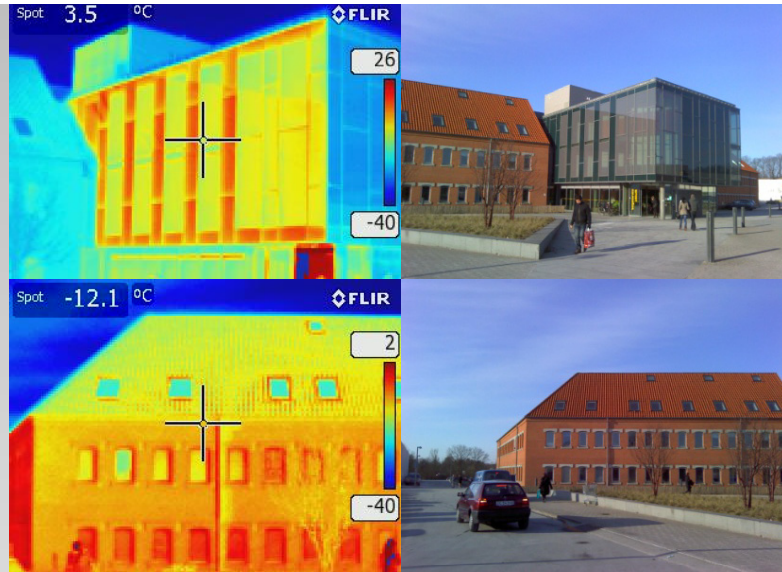
**Energy consumption 2012**



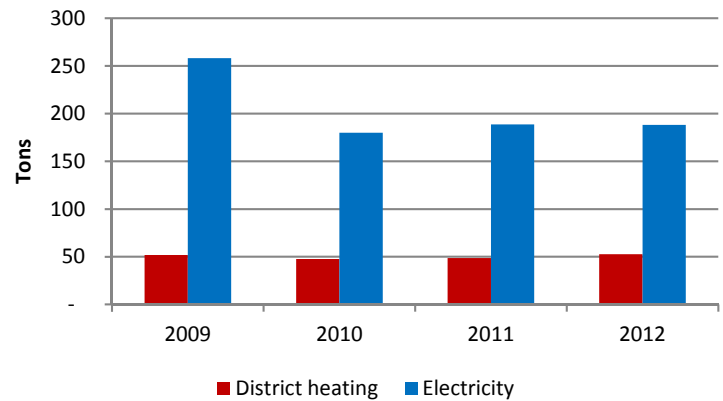
**ECO-City project partners**

## Lessons learned:

- Even well designed glass facades may give problems with glare and thermal fluctuations
- Modernisation of electrical lighting is important
- Separate meters are needed on server room, kitchen and canteen, battery charger room for assistive electrical devices in order to split consumption into end uses
- The number of employees has increased due to reorganisations which influences consumption



Annual CO<sub>2</sub> emission  
Prøvestenen



## Key figures

| Heat trans. | Unit               | Normal practice | Concerto spec. | Actual | Energy consumption | Unit                     | Normal practice | Concerto spec. | Actual 2011 | Actual 2012 |
|-------------|--------------------|-----------------|----------------|--------|--------------------|--------------------------|-----------------|----------------|-------------|-------------|
| Outerwall   | W/m <sup>2</sup> K | 0.4             | 0.3            | 0.15   | Heat               | kWh/m <sup>2</sup>       | 59              | 41             | 50          | 50          |
| Roof        | W/m <sup>2</sup> K | 0.4             | 0.2            | 0.12   | Pipe losses        | kWh/m <sup>2</sup>       | 17              | 9              | 2           | 6           |
| Floor       | W/m <sup>2</sup> K | 0.3-0.6         | -              | 0.1    | Ventilation        | kWh/m <sup>2</sup>       | 30              | 21             | -           | -           |
| Windows     | W/m <sup>2</sup> K | N.A.            | -              | -      | Hot water          | kWh/m <sup>2</sup>       | 7               | 5              | 1           | 1           |
| Glazing     | W/m <sup>2</sup> K | 2.9             | 1.1            | 1.1    | <b>Total heat</b>  | <b>kWh/m<sup>2</sup></b> | <b>113</b>      | <b>76</b>      | <b>53</b>   | <b>57</b>   |
| Doors       | W/m <sup>2</sup> K | -               | -              | -      | Lighting           | kWh/m <sup>2</sup>       | 36              | 18             | 45          | 45          |
| Vent. rate  | h <sup>-1</sup>    | 3-8             | > 2            | 0.5    | Other              | kWh/m <sup>2</sup>       | 15              | 17             | -           | -           |
|             |                    |                 |                |        | <b>Total elec.</b> | <b>kWh/m<sup>2</sup></b> | <b>51</b>       | <b>35</b>      | <b>45</b>   | <b>45</b>   |
|             |                    |                 |                |        | PV                 | kWh/m <sup>2</sup>       | 0               | 0              | 0           | 0           |
|             |                    |                 |                |        | <b>Total</b>       | <b>kWh/m<sup>2</sup></b> | <b>164</b>      | <b>111</b>     | <b>98</b>   | <b>102</b>  |

## ECO-City project partners