WARSAW'S HISTORY OF IMPLEMENTING ENERGY SYSTEMS,
BUILDINGS EFFICIENCY AND RELATED PROJECTS

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SE4ALL Webinar
Warsaw, 1 September 2015
The City of Warsaw

Main features of the Capital City of Poland:

• administrative area: 517 km²
• inhabitants within this area: 1.7 million
• inhabitants within agglomeration: 3.3 million
• density of population: 3300 per km²
• registered enterprises: 360 000
• registered vehicles: 1.2 million
• budget expenditure for 2015: € 3.4 billion (USD 3.9 billion)
• unemployment: 4.5%
• 78 universities and colleges
• 270 thousand students
Sustainable Energy Action Plan

Covenant Of Mayors initiative
• Warsaw joined in 2009

SEAP target – improvement of energy efficiency and reduction of GHG emissions - calculated as:
• 80% of CO$_2$ emission in 2020 comparing to the base year,
• 80% of energy consumption in 2020 comparing to the base year,
• at least 20% of energy will be produced from RES,
• information and promotion actions regarding energy management/conservation will be implemented.

SEAP target for 2020 compared to the base year 2007

<table>
<thead>
<tr>
<th>Year</th>
<th>Energy consumption [MWh/year]</th>
<th>CO$_2$ emission [MgCO$_2$/year]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>28 394 431</td>
<td>12 952 984</td>
</tr>
<tr>
<td>2020</td>
<td><strong>22 715 545</strong></td>
<td><strong>10 362 387</strong></td>
</tr>
</tbody>
</table>
SEAP– main activities on reduction of energy consumption

<table>
<thead>
<tr>
<th>No.</th>
<th>Tasks</th>
<th>Planned energy savings in 2020</th>
<th>Reduction of CO₂ [t/a]</th>
<th>Investment [million €]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Complex buildings retrofit in housing sector</td>
<td>1 399 200</td>
<td>415 562</td>
<td>1020</td>
</tr>
<tr>
<td>2</td>
<td>Complex buildings retrofit in service sector</td>
<td>1 150 783</td>
<td>341 782</td>
<td>612</td>
</tr>
<tr>
<td>3</td>
<td>Complex buildings retrofit in public sector</td>
<td>359 718</td>
<td>106 836</td>
<td>191</td>
</tr>
<tr>
<td>4</td>
<td>Modernization of heating system (e.g. replacement of local heat sources with more efficient heat sources)</td>
<td>105 000</td>
<td>31 185</td>
<td>87</td>
</tr>
<tr>
<td>5</td>
<td>Retrofit of industrial buildings</td>
<td>185 820</td>
<td>55 189</td>
<td>49</td>
</tr>
<tr>
<td>6</td>
<td>Modernization of indoor lighting</td>
<td>85 228</td>
<td>83 693</td>
<td>9</td>
</tr>
<tr>
<td>7</td>
<td>Modernization of street and outdoor lighting</td>
<td>55 000</td>
<td>54 010</td>
<td>25</td>
</tr>
<tr>
<td>8</td>
<td>Replacement of old home electronic equipment</td>
<td>16 667</td>
<td>16 367</td>
<td>57</td>
</tr>
<tr>
<td>9</td>
<td>Replacement of old IT equipment</td>
<td>22 727</td>
<td>22 318</td>
<td>38</td>
</tr>
</tbody>
</table>
History of district heating in Warsaw

1952
Zakład Sieci Cieplnej „Warszawa w Budowie”
(Heating Network Plant „Warsaw under Construction”)

1953
Miejskie Ciepłownie w m. st. Warszawie
(Municipal Heat Plants in the Capital City of Warsaw)

1960
Stołeczne Przedsiębiorstwo Energetyki Cieplnej (SPEC)
(Municipal Heating Enterprise)

2003
SPEC S.A. (SPEC Company, Inc.)

2012
Dalkia Warszawa (Dalkia Warsaw)

2014
Veolia Energia Warszawa (Veolia Energy Warsaw)
Privatization of SPEC

- Changes in ownership structure
- Strategic Committee with smooth cooperation between the City and the private owners
- Benefits for citizens
- Guaranteed investments secured by contract of sale of SPEC
The largest district heating network in EU, next to Berlin

- 1,720 km of network
- 15,000 substations
- 18,600 buildings
- 22,000 meters
- 78% city demand’s fulfilled
Warsaw as a area of low heat prices

District heating prices in year 2011

EUR/GJ

- Denmark
- Sweden
- Germany
- Czech Republic
- France
- Austria
- Poland
- Hungary
Warsaw as a area of low heat prices

- 70% cheaper than electricity
- 55% cheaper than heating fuel
- 33% cheaper than natural gas
Modernization and extension of „Czajka” Wastewater Treatment Plant

• 30 January 2008 – Warsaw Waterworks (MPWiK S.A.) signed a contract for the extension of the Czajka WWTP – completed in 2012. The contract’s main subject were high-tech wastewater treatment lines.

• Additional elements like sludge thermal incineration plant, which provides the Czajka with heat and electricity, with max. day capacity - 671 t of fuel and max. electric power - 1,6 MW. Energy is obtained also from biogas combustion. Total yearly output of the installations: 29 930 MWh of electricity (30% of our street lighting’s consumption) and 58 133 MWh of heat (equivalent of 140 railway tracks of coal).

• Total value with accompanying investments amounted to 822 million euro: the largest recent investment in Europe in the field of environmental protection at one of the largest construction sites in Poland, which ensured treatment of 100% wastewater from the Warsaw area (capacity increased from 240 000 m³/day up to 435 300 m³/day) and reduced amount of connected nitrogen released via Vistula River to the Baltic Sea by 74%, while in case of phosphorus – by 84%.

• External co-financing started already from pre-accession funds, after Polish accession to the European Union financing amounting to 248 million euro from the Operational Programme „Infrastructure and Environment”.
Energy efficiency in buildings – OPEN HOUSE

• Project OPEN HOUSE (7th Framework Programme, 19 partners – mainly from construction sector, coordinator - Acciona)

• Developed and tested in more than 60 case-studies throughout Europe a common methodology of assessing sustainability of buildings, feasible to use in public procurement procedures

Energy efficiency in buildings – E3SoHo

• Project E3SoHo (Competitiveness and Innovation Framework Programme, coordinator - Acciona) – holistic solutions for ICT-enabled energy efficient social housing developments

• Developments tested in 3 cities: Warsaw, Genoa, Saragossa

• Website: http://www.e3soho.eu

Detectors in flats

Meters

Weather station

Pad
Energy efficiency in buildings – ICE-WISH

Project ICE–WISH (Competitiveness and Innovation Framework Programme, coordinator - Consorzio Nazionale CasaQualita) - comprehensive, integrated control and management system of media consumption in buildings, in particular in social housing

- Partners: 10 European cities and experts
- Website: [http://www.ice-wish.eu/uk/icewish.asp](http://www.ice-wish.eu/uk/icewish.asp)
Thank you!