Heat metering and consumption-based billing

Experience in City of Šabac, Serbia

Consumption metering in district heating

Webinar, November 24, 2020
Consumption metering in district heating

Legislative framework

The Energy Law designates local governments as regulators in the district heating sector.

District heating recognizes three energy activities: production, heat distribution, and heat supply.

The Ministry of Energy has prescribed a Methodology for heat billing.

\[
C_E = C_V + C_F = \frac{\sum_{i=1}^{n} Fuel Costs + \sum_i ElectricityCost + \sum_i FluidCosts + \sum_1^n OperatingCosts}{\sum E_{HS}} + \sum_1 A
\]

Operating rules of DH system adopted by Municipality.
Consumption metering in district heating

Legislative framework

Energy policy of the City of Šabac – the document has adopted by the local Assembly in 2018.

Goals

Efficient use of energy and fuels,

Implementation of sustainable renewable energy technologies,

Support to local economic development and support to the development of the local energy market,

Environmental protection,

Improvement of the quality of life in Sabac,

Energy independence.
Consumption metering in district heating

Legislative framework

Development of energy service market

Energy cooperatives that promote collective actions

Creation of prosumers as new citizens profile (investment in small RES DH, investment in PV where energy company rent PV systems and pay rent to energy cooperative)
PUC „Toplana-Šabac“ takes the role of ESCO

- Public utility company „TOPLANA-SABAC“ contracted with EBRD 2.5 million EUR loan for improvement of the energy performance of existing buildings
- The loan repayment period is 12 years
- Project implementation is based on EBRD rules
- Based on energy savings, DH company customers payoff their part of the investment
- Besides their own business TOPLANA-SABAC plays the role of ESCO
- Using energy metering the effects of the investment will be proven
- Financial model without incentives but with long-term pay-off period
Consumption metering in district heating

PUC „Toplana-Šabac“ takes the role of ESCO

Poor quality of buildings and inadequate maintenance of buildings cause extremely high heat losses.

Does it possible to introduce energy billing in a building like this one?
Consumption metering in district heating

PUC „Toplana-Šabac“ takes the role of ESCO

Before renovation

Energy examination using an infrared camera

After renovation

The average payback period is 12 years
**Consumption analysis**

**Year:** 2019

**Heated area:** 55 m²

**Units:** kWh/m²

<table>
<thead>
<tr>
<th>Month</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>9.85</td>
<td>21.73</td>
<td>31.30</td>
</tr>
<tr>
<td>February</td>
<td>4.86</td>
<td>20.08</td>
<td>28.78</td>
</tr>
<tr>
<td>March</td>
<td>2.54</td>
<td>9.73</td>
<td>15.27</td>
</tr>
<tr>
<td>April</td>
<td>1.47</td>
<td>6.24</td>
<td>7.87</td>
</tr>
<tr>
<td>May</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>June</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>August</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>September</td>
<td>0.04</td>
<td>1.32</td>
<td>1.85</td>
</tr>
<tr>
<td>October</td>
<td>2.12</td>
<td>9.91</td>
<td>12.34</td>
</tr>
<tr>
<td>November</td>
<td>8.05</td>
<td>14.87</td>
<td>21.09</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>28.94</strong></td>
<td><strong>83.88</strong></td>
<td><strong>118.51</strong></td>
</tr>
</tbody>
</table>

*Consumption metering in district heating*

**A – Thermal insulation + Thermostatic valves + Heat allocators**

**B – Thermal insulation without TS valves without allocators**

**C – Without thermal insulation without TS valves without allocators**

A – building Energy class „C“

< 70 kWh/m² a
Consumption metering in district heating

Conclusion

Energy efficiency is predictable for energy billing

Solving issue of energy poverty is one of outcomes

Finnancing of energy efficiency measures including TS valves and heat allocators installation
Thank You for attention

Slobodan Jerotić
slobodan.jerotic@yahoo.com

Šabac, November 24, 2020