Eco-Efficient Substations: Driving quality by certification

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Content

• AIT Austrian Institute of Technology
• Why certification?
• CEN – European Committee for Standardization
• Background of the CEN Workshop
• CWA 16975 Eco-efficient substations
• Certification process
Ownership structure
50.46% Republic of Austria
49.54% Federation of Austrian Industries

Employees 1,300

Energy  Health & Bioresources  Digital Safety & Security  Vision, Automation & Control
Mobility Systems  Low-Emission Transport  Technology Experience  Innovation Systems & Policy
Why certification?

- Transparent instrument for building/increasing confidence in the market
- Achieving high quality due to:
  - Unitary testing and certification process
  - Independent third party confirmation
  - Required minimal efficiency
  - Check of safety criteria
- Possibilities for marketing activities
- Increased visibility and competitiveness
CEN - European Committee for Standardization

- Platform for development of technical documents
  - **CEN Workshop Agreements (CWA)**
  - Technical specifications (TS)
  - European standards (EN)
  - CGs - CEN Guides (CG)
  - Technical Reports (TR)

- 34 member states
CWA - CEN Workshop Agreement

• Has NOT the status of a European standard
• International accepted technical document
• Defines rules and requirements for products and processes
• Developed and approved by an independent workshop structure within the framework of the CEN
• Period of validity is at least 3 years, then:
  • Withdrawal
  • Prolongation of 3 years (possible revision)
  • Transition into an European standard
Background of the CEN Workshop

• Basis for a future European standard (EN)
• So far no unitary and international accepted certification rules for district heating substations
• Many successful examples from other sectors e.g. heat pumps, DH-pipes, etc.
• Initiated and supported by DHC+ technology platform and EuroHeat&Power
• Establishment of an voluntary international certification
Background of the CEN Workshop - Participants

• Substations manufacturer
• Component supplier
• DH supplier
• National Associations
• Research and test institutes
• Universities
• Standardization Organizations
CWA 16975: Eco-efficient Substations for DH

- Technical part
  - Brand neutral definition of basic characteristics
  - Identification of future requirements
- Environmental Part
  - Evaluation of energy efficiency
  - Introduction of energy efficiency classes
- Testing and certification part
  - Development of a standardized test method
  - Definition of a certification system
CWA 16975 – Technical part

• General definition of an Eco-efficient substation
  • Connection between the network and the consumer system
  • For space heating and/or DHW preparation
    • Max. 500 kW
    • No single family house or apartment stations
  • Achieving the best possible ratio between efficiency and costs
CWA 16975 – Technical part

• Requirements for an Eco-efficient Substations
  • Low return temperatures
  • Low pressure drop
  • Precise control system
  • High quality components

• Further recommendations and advanced control strategies
CWA 16975 – Environmental Part

- Introducing energy efficiency classes
  - Platinum (Best level)
  - Gold
  - Silver
  - Bronze (Basis level)
- Points in the following categories:
  - Heat losses
  - Pressure drop
  - Cooling of return temperature
  - Energy saving function
## CWA 16975 – Environmental Part

**Point system for heating and domestic hot water preparation**

<table>
<thead>
<tr>
<th>Points</th>
<th>Eco Efficient Substation label</th>
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</thead>
<tbody>
<tr>
<td>70-100</td>
<td>EES - Platinum</td>
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<tr>
<td>45-69</td>
<td>EES - Gold</td>
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<td>EES - Silver</td>
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<tr>
<td>0-15</td>
<td>EES - Bronze</td>
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**Point system for heating only**

<table>
<thead>
<tr>
<th>Points</th>
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<td>EES - Gold</td>
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<tr>
<td>14-37</td>
<td>EES - Silver</td>
</tr>
<tr>
<td>0-13</td>
<td>EES - Bronze</td>
</tr>
</tbody>
</table>
CWA 16975 – Testing and certification part

- Standardized test method
  - Verification of conformity with the technical specifications
  - Pressure test
  - Static performance test for space heating
  - Static performance test for domestic hot water preparation
  - Dynamic performance test for domestic hot water preparation
- Definition of a certification system
Certification process

A: 1st submission:
- Substation design calculation
- Component list

B: Selected test sample

C: 2nd submission:
- Substations to test
- Substation design calculation

D: Test results and report

E: Application for certification

F: Certification

Certification applicant ➔ Testing body ➔ Certification body

Certification applicant ➔ Certification body

Certification applicant ➔ Testing body ➔ Certification body

Certification applicant ➔ Certification body ➔ Certification applicant

Certification applicant ➔ Certification body ➔ Certification applicant

Certification applicant ➔ Certification body ➔ Certification applicant
Certification process

• Organization of certification
Outlook

• CWA is available at national standardization institutes

• Information and documents for certification are available at EuroHeat&Power
  • https://www.euroheat.org/publications/certification-of-eco-efficient-substations/

• AIT will offer testing and certification services and supports manufacturers during the certification process
Thank you!

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