Swiss regulations to control emissions from residential wood burning

Working Group on Strategies and Review (CLRTAP)
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PM2.5 emissions (2015)

Total: ~7300 t

Residential wood combustion: 18%
Revision of Swiss regulations for wood combustion installations up to 70 kW

Context
• Catch up with technological progress
• harmonization with EU construction products regulation and ecodesign directive
• importance of periodic inspections and monitoring under operating conditions in addition to type approval
Revision of Swiss regulations for wood combustion installations up to 70 kW

Topics

• compatibility of regulations for placing on the market with ecodesign regulations:
  • EU 2015/1185 solid fuel local space heaters <50 kW
  • EU 2015/1189 solid fuel boilers <500 kW

• tightening of Swiss ELVs for CO and introduction of ELVs for dust under operating conditions

• obligation for periodic inspections and monitoring

• obligation for equipment of boilers with heat accumulators
Emission limit values for wood combustion installations up to 70 kW under operating conditions

<table>
<thead>
<tr>
<th>category</th>
<th>CO (mg/m³)</th>
<th>dust* (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>cooking stoves</td>
<td>4’000</td>
<td>100</td>
</tr>
<tr>
<td>single room heaters</td>
<td>2’500</td>
<td>100</td>
</tr>
<tr>
<td>boilers, hand stoked</td>
<td>2’500</td>
<td>100</td>
</tr>
<tr>
<td>boilers, autom. stoked</td>
<td>1’000</td>
<td>50</td>
</tr>
</tbody>
</table>

O₂ ref: 13%  
* in force after 1.6.2019
Putting into service, inspection and monitoring

<table>
<thead>
<tr>
<th></th>
<th>putting into service</th>
<th>periodic check</th>
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</thead>
<tbody>
<tr>
<td>cooking stoves</td>
<td>declaration of performance or acceptance</td>
<td>periodic inspection every 2 years + informative guidance</td>
</tr>
<tr>
<td></td>
<td>measurement CO &amp; dust or ESP</td>
<td></td>
</tr>
<tr>
<td>single room heaters</td>
<td>acceptance measurement CO &amp; dust</td>
<td>periodic monitoring CO every 4 years</td>
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<tr>
<td>boilers, hand stoked</td>
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<td>boilers, autom. stoked</td>
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</tbody>
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Periodic inspection & measures in case of non-compliance

- **Visual inspection and «soft» measures**
  - fuel wood quality (moisture, size, naturalness, no waste)
  - residues in combustion chamber (ash, soot)
  - operating conditions (ignition from top, air supply)
  - technical condition of heating device (air flow, tightness)

- **«hard» measures**
  - retrofit with electrostatic precipitator
  - replacement of heating device
Heat accumulators for wood boilers up to 500 kW

- heat accumulators → emission reduction by avoiding operation at partial load
- definition of minimum accumulator volumes for hand stoked and automatic boilers depending on nominal heat output
- exception for pellet boilers < 70 kW (low emissions under modulated partial load)
Cost & benefits

expected reduction of dust emissions from small combustion installations: ~ 30% (time horizon: 10 years)
→ reduction of external costs from health impacts and material damage: 50 – 250 mio CHF per year
→ costs for periodic monitoring & inspections, retrofitting and replacement: 150 – 260 mio CHF, cumulated over next 10 years
Thank you for your attention!