

# Abatement measures for Small Combustion Installations – German Legislation

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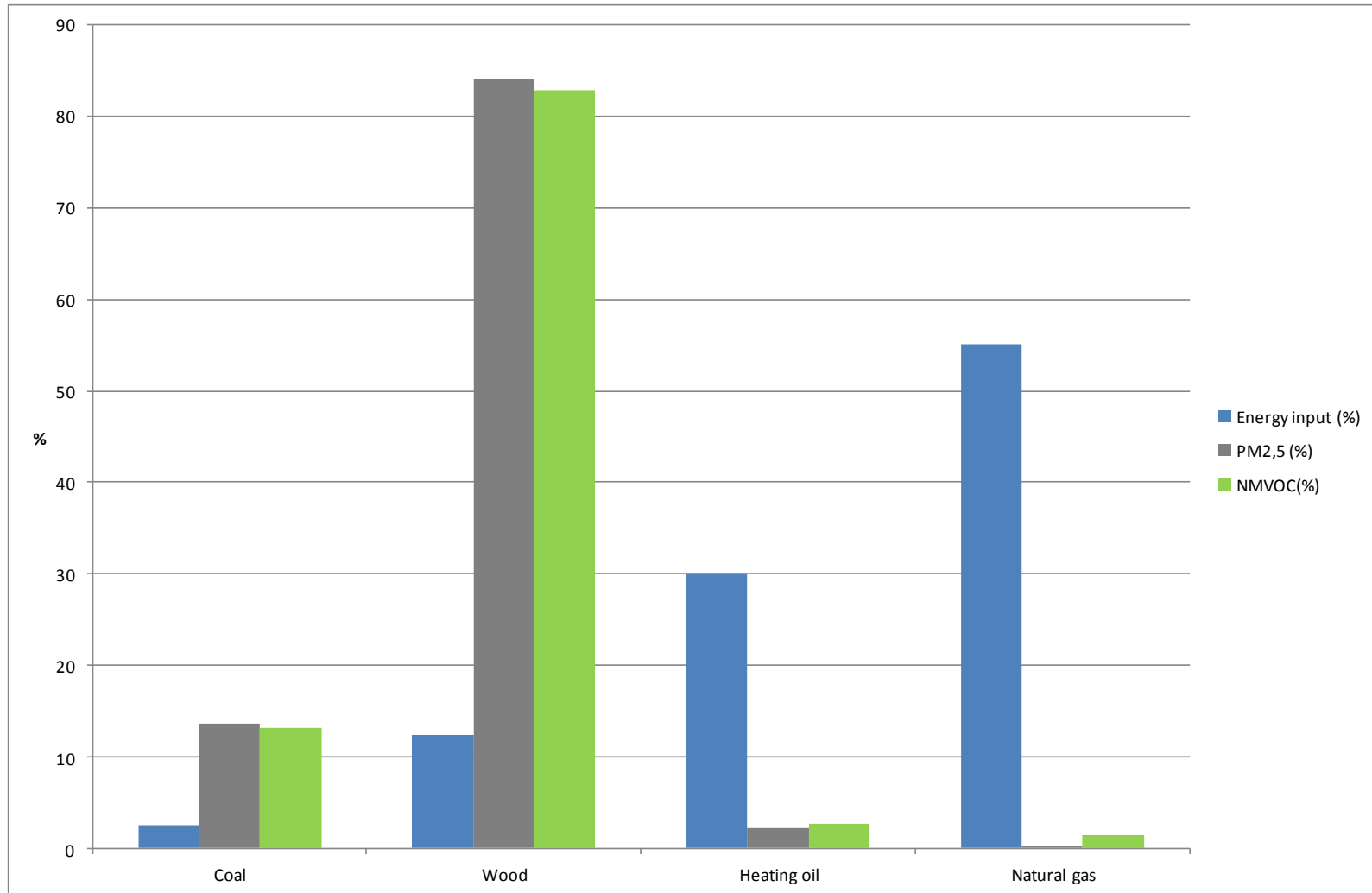
*Foto: Prof. Dr. Günther Baumbach, TU Stuttgart*

# Renewable energy and Air Quality

## EU - Objective:

- Achieving 20% renewable energy in the EU by 2020
- Currently 2/3 of EU final renewable energy consumption is from biomass
- ➡ The use of wood for domestic heating is promoted for climate protection reasons (e.g. Renewable Energy Incentive Program of the German government)
- ➡ Increasing use of wood in small combustion installations may cause problems for air quality

# Emissions from SCI in Germany 2010



# Situation of wood combustion in Germany

- Small combustion installations in Germany: about 14 million stoves and about 0.7 million boilers for solid fuels

## Problems:

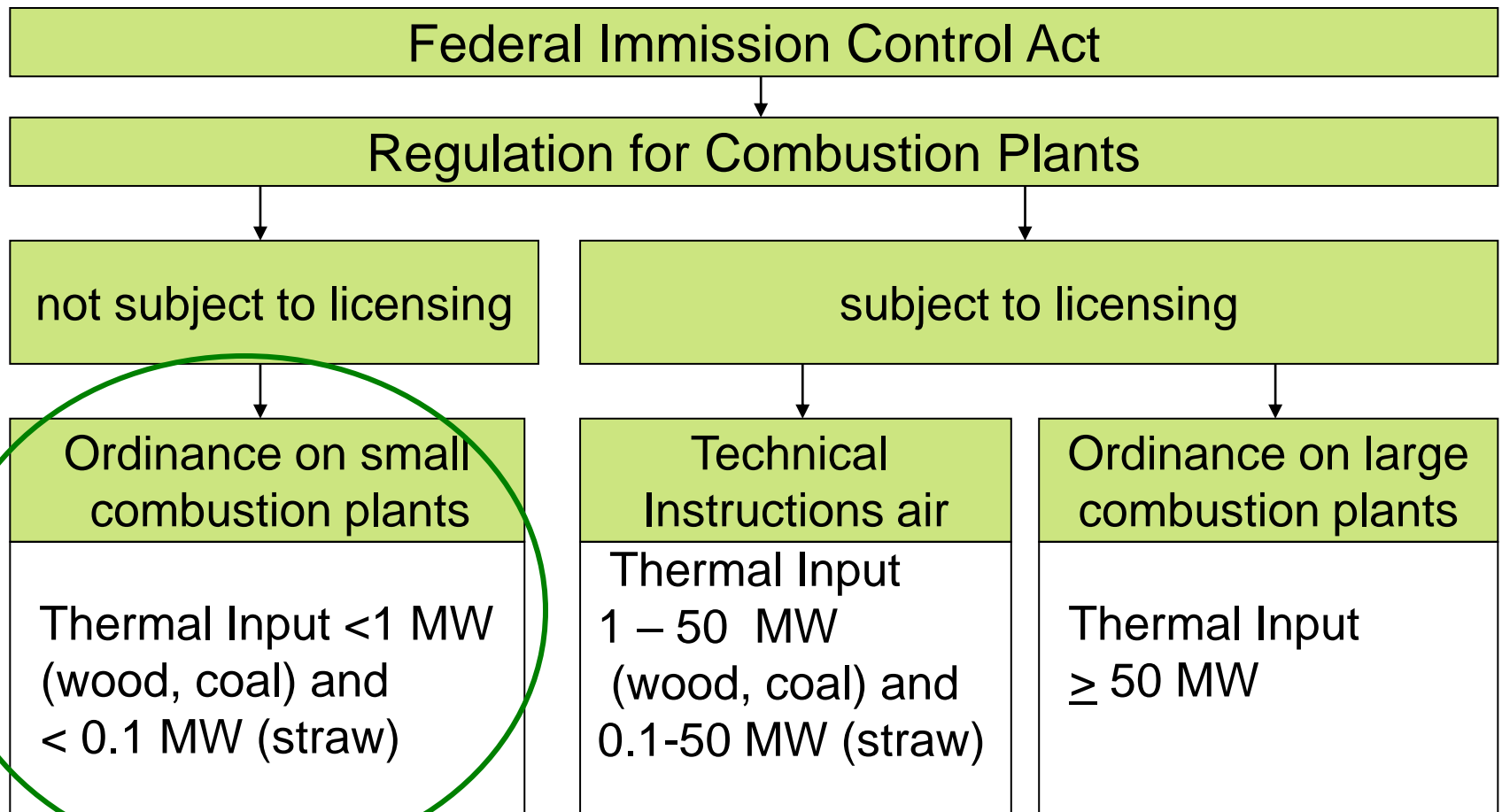
1. Combustion technology
2. Maintenance of the appliances
3. Consumer behaviour
4. Quality of wood (e.g. humidity, use of treated wood)



**Ordinance on small combustion installations amended in 2010**

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# Legal framework in Germany



# 1. Combustion technology

## Roomheaters:

- limit values for CO, dust and efficiency at type tests
- 2 Tiers: 2010 and 2015

## Boilers:

- Limit values for CO and dust at operation
- 2 Tiers: 2010 and 2015
- Buffer tank required



# Emission limit values (type tests) – room heaters, 13 % O<sub>2</sub>

<b>Tier 1:</b> Put into operation after entry into force of the Ordinance		<b>Tier 2:</b> Put into operation after 31. December 2014		
<b>CO</b> <b>[g/m<sup>3</sup>]</b>	<b>Dust</b> <b>[g/m<sup>3</sup>]</b>	<b>CO</b> <b>[g/m<sup>3</sup>]</b>	<b>Dust</b> <b>[g/m<sup>3</sup>]</b>	<b>Efficiency</b> <b>[%]</b>
0.4 (pellet stoves) to 3.5 (cookers)	0.03 (pellet stoves) to 0.1 (others)	0.25 (pellet stoves) to 1.5 (cookers)	0.02 (pellet stoves) to 0.04 (others)	70-90%

## Emission limit values (regular controls) for boilers, 13 % O<sub>2</sub>

	Rated thermal output [kW]	Dust [g/m <sup>3</sup> ]	CO [g/m <sup>3</sup> ]
<b>Tier 1:</b> Installations put into operation from 3/2010 – wood, coal	≥ 4	0.1	0.3 – 1.0
Wood pellets	≥	0.06	0.5 – 0.8
<b>Tier 2:</b> Installations put into operation after 31 January 2014	≥ 4	0.02	0.3 – 0.4



## 2. Maintenance

- Technical inspection every 3-4 years for **roomheaters**;
- Measurement of dust and CO at every **boiler** once in 2 years;
- Information on maintenance in brochures etc.



### 3. Consumer behaviour

- Personal consultation for every operator by the chimney sweeper for every new installation and after every change of an operator



### 4. Fuel Quality

- List of admissible fuels, standardised quality requirements where possible (wood pellets, wood briquettes, light heating oil...)
- Requirements for wood quality: untreated wood, humidity < 25 %
- Other biomass: straw, grain and similar fuels with additional requirements;
- Regular Inspection of fuel storages

## Existing installations

- After a transition period of 5 to 15 years (depending on the age of the installation) new provisions also apply to existing boilers;
- Stoves: retrofitting (installation of a filter) or exchange of old appliances after a transition period depending on the date of type testing; For existing stoves less stringent limit values apply than for new ones.



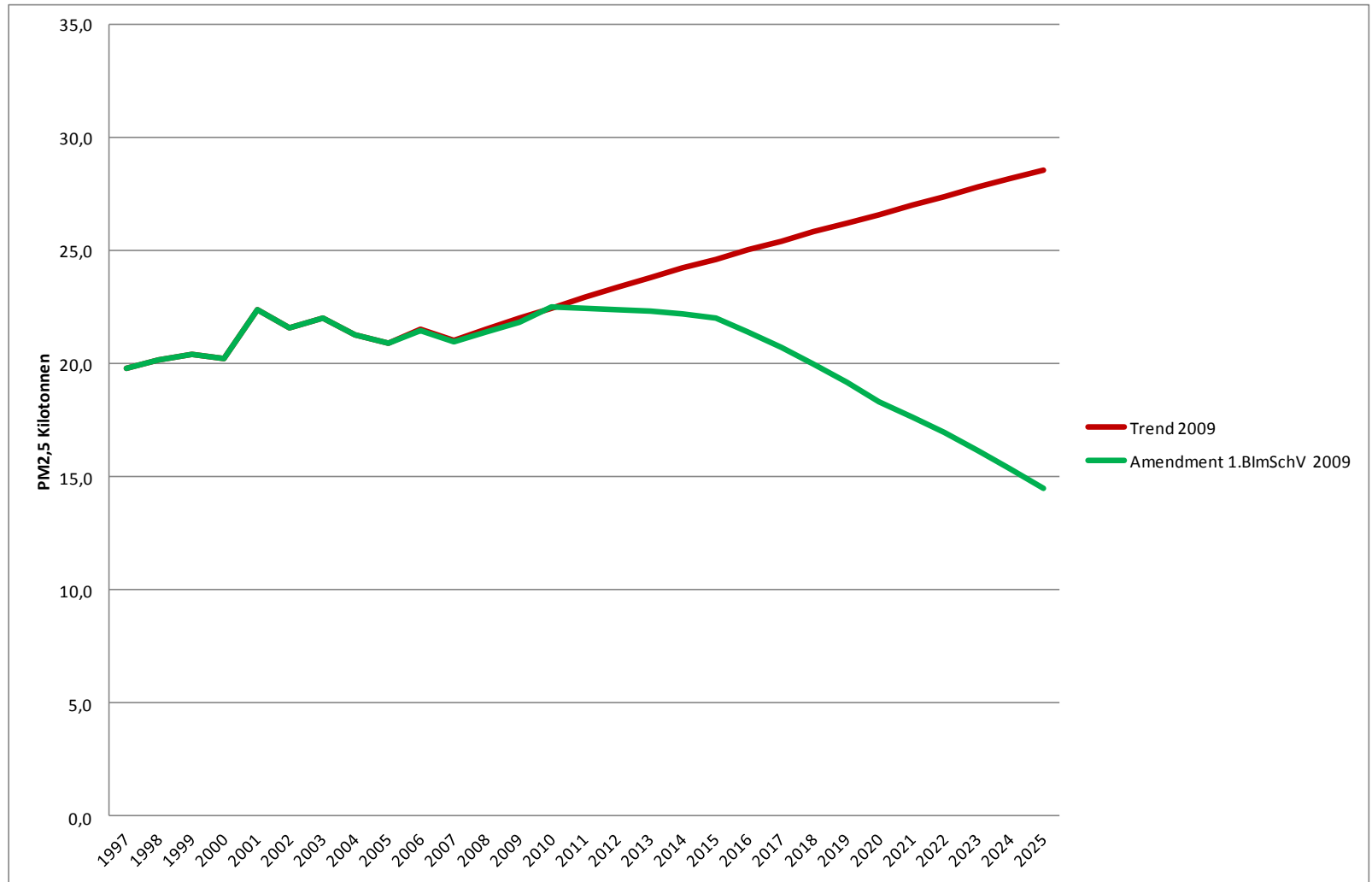
## Experiences

- Roomheaters:  
Limit values of the second tier have been reached more quickly than expected, but results in real life operation may differ.
- Boilers:  
Tier 2 Limit values are still challenging
- Tackling real life stays important

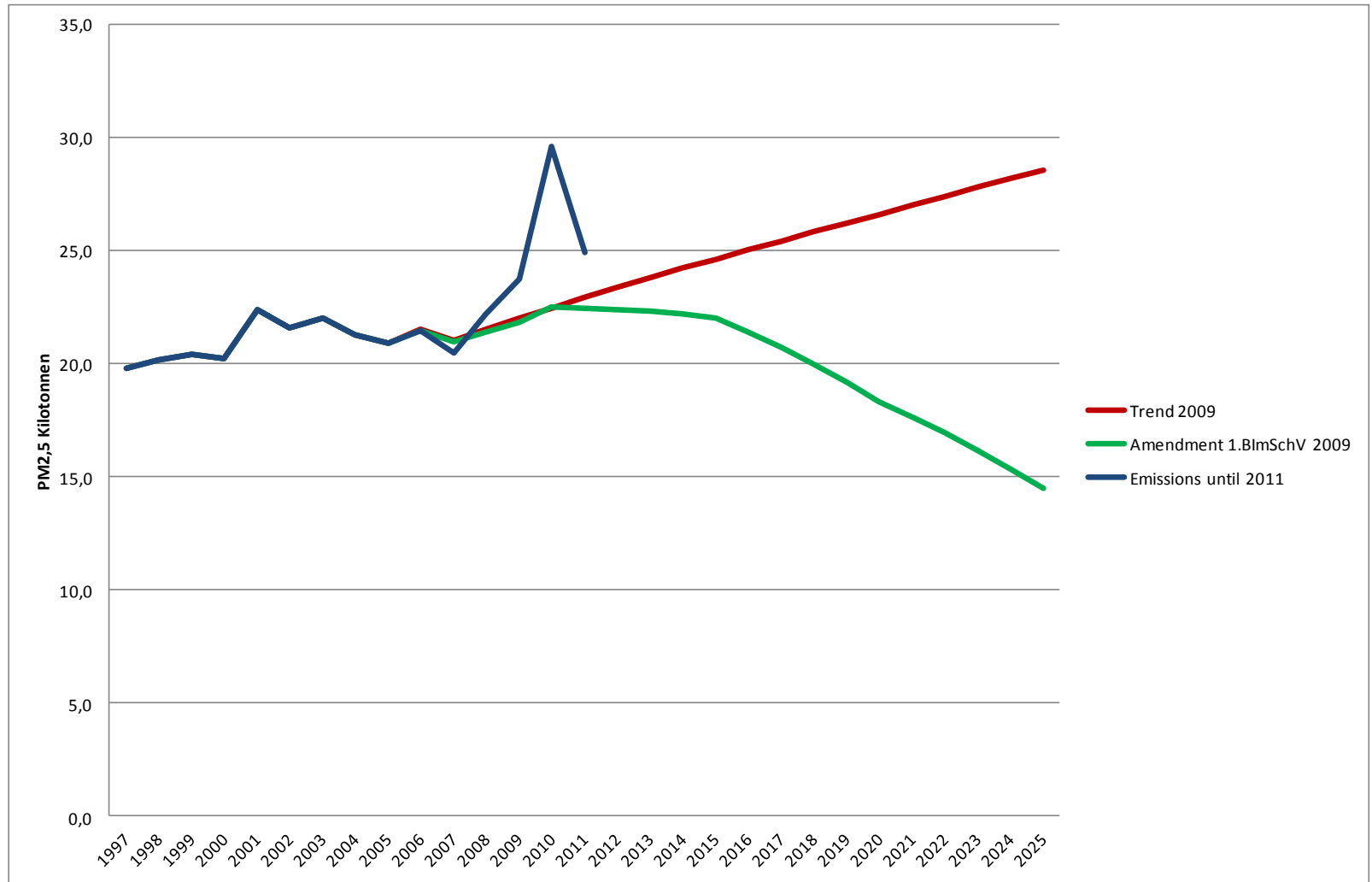
## Outlook

- 2 Ecodesign regulations in preparation for roomheaters and boilers
- Requirements for putting appliances on the market

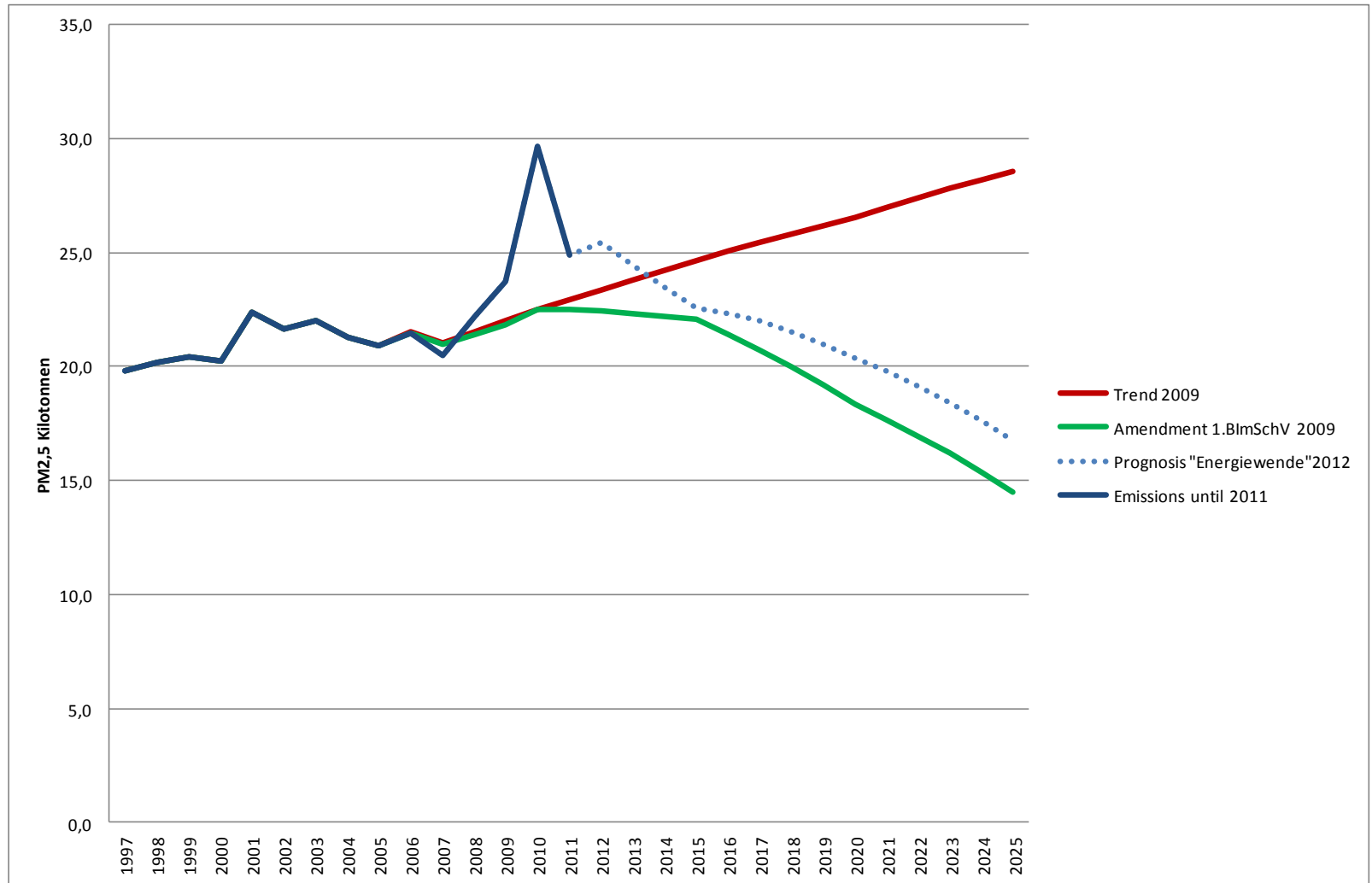
# Prognosis of PM<sub>2.5</sub> emissions 2009



# PM<sub>2.5</sub> Emissions until 2011



# Prognosis of PM<sub>2.5</sub> emissions 2012



**Thank you for your attention**

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