



Ympäristöministeriö  
Miljöministeriet  
Ministry of the Environment

# Air Pollution Control in Finland

---

Mr. Jaakko Kuisma, Senior Specialist  
Ministry of the Environment

# Contents

- Main air pollution sources and energy in Finland
- Short overview of the air pollution control legislation in Finland
- Example of the current emission limit values (IED) for coal fired power plants
- Future development of emission limit values
- Medium combustion plant directive
- Supervision of the industrial operators and E-PRTR reporting

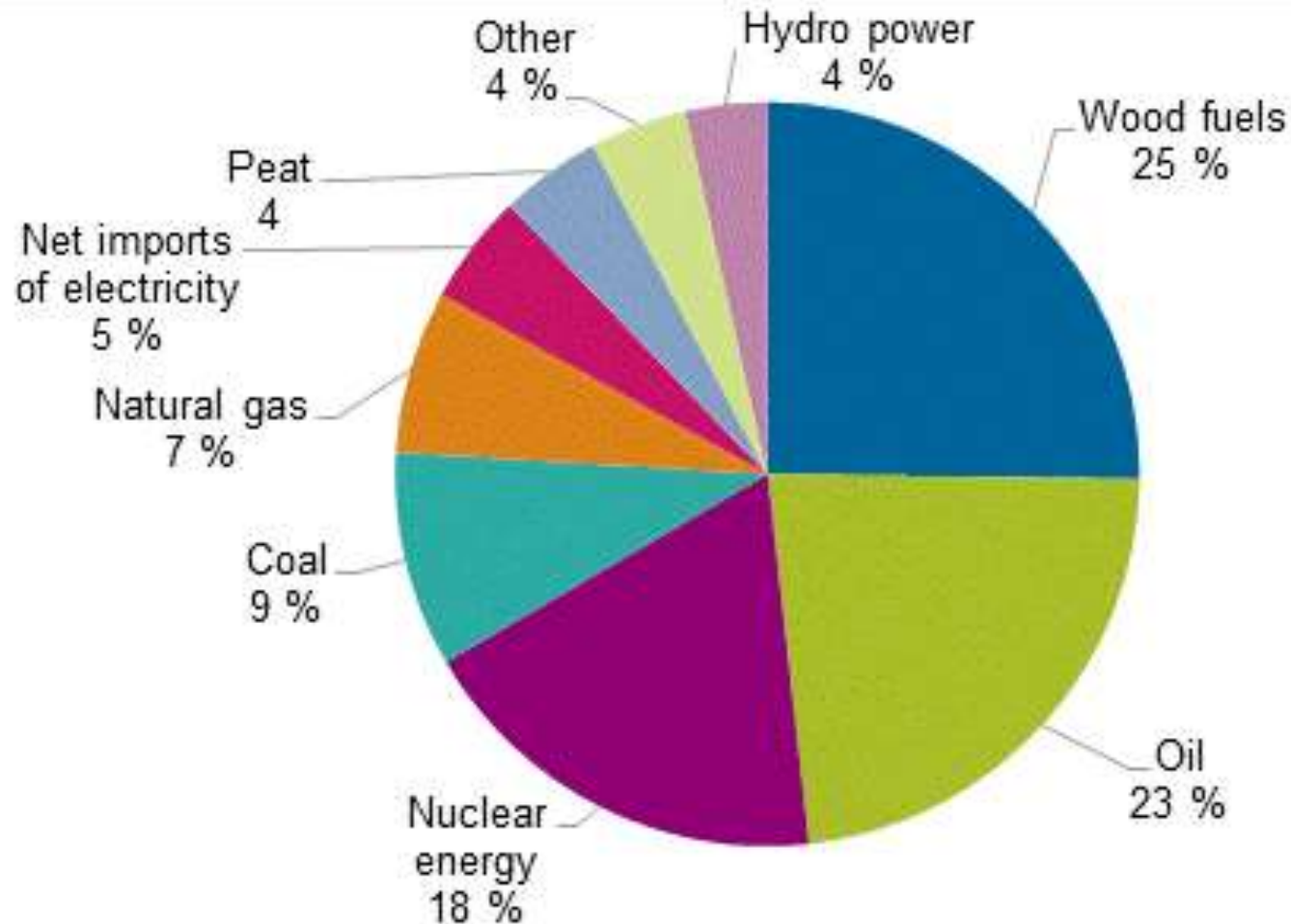
# Main air pollutions sources and air quality

- Main pollution sources causing air quality problems are traffic and small scale e.g. household wood combustion and various air quality episodes (including transboundary pollution from forest fires and atmospheric inversion situations in winter time)
- Air quality limit values are exceeded only on some locations due to main pollution sources, the more severe episodes are due to spring-term particulate episodes and cross-border sources
- In overall emissions large point sources are dominant in SO<sub>2</sub> emissions, small sources in PM<sub>2,5</sub> emissions and both in NO<sub>x</sub>
- The air quality data from all Finnish stations is available in [www.ilmanlaatu.fi](http://www.ilmanlaatu.fi)

# Special energy features in Finland

- Limited domestic energy resources, the share of bioenergy, peat and hydropower is 35 %
- High energy consumption per capita, industry has 50 % share of the final energy (and electricity) consumption
- EU's coldest Member State, the share of space heating is 23 % of the total energy consumption. High share of district heating, almost 50 % market share
- Finland has a relatively large number of large combustion plants (LCPs), 137 units in 2009, currently the dominant technology is fluidised bed combustion
- The energy system has a 500 installations in the range of 20-50 MW and 2 000 installation in 1-20 MW mainly in heat production

# Total energy consumption in 2014



# Air pollution control legislation in Finland

- Environmental protection law and act (2000, revised in 2014)
- For industrial sources the legislation is based on EU legislation, Industrial Emissions Directive, including applying BAT in environmental permits and European minimum requirements for LCPs, waste incineration, VOC plants and TiO<sub>2</sub> production
- National ordinance for 5-50 MW combustion plants since 2010 to be complied by 2018, yet small scale combustion has been largely unregulated
- EU Ecodesign regulation (new plants up to 500 kW<sub>th</sub>) and medium combustion plant Directive (1-50 MW rated thermal input) approved in the end of 2015
- EU legislation (EURO-standards) for traffic sources
- Municipalities have a responsibility for ensuring local air quality, issuing local environmental protection ordinances and action plans in case of the air quality limit values are exceeded

# Example of pollution control/Coal fired plant

- Currently all coal fired plants above 20 MW need a permit to operate and 5(1)-20 MW plants are registered and follow general binding rules
- Emission limit values are set for sulphur dioxide, nitrogen oxides and dust, other pollutants can be considered in permitting process
- Continuous measurements of the pollutants are required for plants above 100 MW and periodic measurements for smaller plants (every six months to 3 years)
- Monitoring requirements cover typically wider range of pollutants (such as heavy metals)
- Other emission limit values are set in permits based on best available techniques and typically cover water emissions in case of wet desulphurisation and water cooling systems, noise control and site specific issues

# IED emission limit values for coal fired plants

- Coal, new plants, 6 % O<sub>2</sub>, dry flue gas:

Rated thermal input	SO <sub>2</sub>	NO <sub>x</sub>	Dust
50-100	400	300 (400 Lignite PC)	20
100-300	200	200	20
> 300	150 (200 CFB)	150 ( 200 Lignite PC)	10

- Existing plants, 6 % O<sub>2</sub>, dry flue gas:

Rated thermal input	SO <sub>2</sub>	NO <sub>x</sub>	Dust
50-100	400	300 (450 Lignite PC)	30
100-300	250	200	25
> 300	200	200	20

- Additionally existing plants can benefit from several time-limit derogations or derogations based on limited operational hours
- ELVs as monthly averages and daily averages as 110 % of the ELV



# Future development in the emission limit values

- New requirements will enter into force after publication of the BAT-conclusion of the LCP following the Industrial Emission Directive
- Review of the LCP BAT-conclusions has started in 2011
- These are tentatively published in late 2017 and after that the installations have four years to comply including a possibility for derogations
- Overall these conclusions will tighten the existing emissions limit values and tentatively extend the regulation to cover:
- Hg, HCL, HF, NH<sub>3</sub>, CO and N<sub>2</sub>O (only CFB) emissions in coal combustion
- There will be also more focus on long-term emission via annual averaging periods and more extensive monitoring requirements

# Medium combustion plant directive (2015/2193)

- Directive was published 25th of November, 2015
- The scope of the directive is 1-50 MW combustion plants and their NO<sub>x</sub>, SO<sub>2</sub> ja particulate emissions
- In Europe it covers approximately 140 000 combustion plants and 3 000 plants in Finland
- Emission limit values for all plants operating more than 500 hours
- New plants need to comply from the beginning of 2019
- Existing plants of 1-5 MW need to comply by 2030 and 5-50 MW plants by 2025 with some exemptions
- All plants need to be registered latest by 2029
- Monitoring of emissions annually for plants above 20 MW and every three years for 1-20 MW plants

# Emission limit values/Existing plants

1-5 MW plants (mg/Nm<sup>3</sup>, 6 % O<sub>2</sub> solid fuels, 3 % O<sub>2</sub> other fuels)

Pollutant	Solid biomass	Other solid fuels	Gas oil	Liquid fuels other than gas oil	Natural gas	Gaseous fuels other than natural gas
SO <sub>2</sub>	200 <sup>(1)</sup>	<b>1 100</b>	-	350	-	<b>200<sup>(2)</sup></b>
NO <sub>x</sub>	650	650	200	650	<b>250</b>	250
Dust	<b>50</b>	<b>50</b>	-	<b>50</b>	-	-

<sup>(1)</sup> 300 mg/Nm<sup>3</sup> for plants using straw

<sup>(2)</sup> 400 mg/Nm<sup>3</sup> for plants using coke oven gas

5-50 MW plants (mg/Nm<sup>3</sup>, 6 % O<sub>2</sub> solid fuels, 3 % O<sub>2</sub> other fuels)

Pollutant	Solid biomass	Other solid fuels	Gas oil	Liquid fuels other than gas oil	Natural gas	Gaseous fuels other than natural gas
SO <sub>2</sub>	200 <sup>(1)</sup>	400 (5-20 MW 1 100)	-	350 (5-20 MW 850 until 2030)	-	35 <sup>(2)</sup> <sup>(3)</sup>
NO <sub>x</sub>	650	650	200	650	200	250
Hiukkaset	30 (5-20 MW 50)	30 (5-20 MW 50)	-	30	-	-

<sup>(1)</sup> 300 mg/Nm<sup>3</sup> for plants using straw

<sup>(2)</sup> 400 mg/Nm<sup>3</sup> for plants using coke oven gas and 200 mg/Nm<sup>3</sup> for plants using blast furnace gas

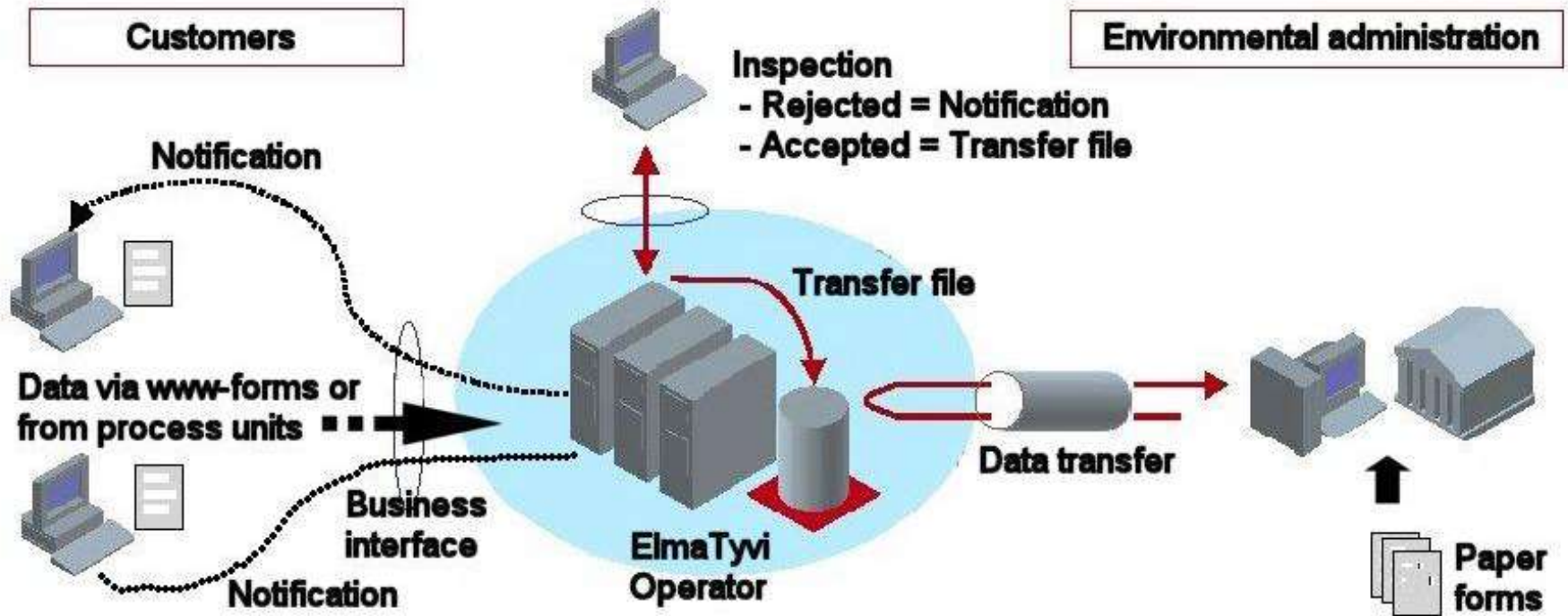
<sup>(3)</sup> 170 mg/Nm<sup>3</sup> for plant using biogas

# Supervision of the industrial operators

- 13 *Centres for Economic Development, Transport and the Environment* are responsible for supervision of the large installations
- Each LCP has principal supervisor, large sites might also have sector (air, water, waste) supervisors
- Each LCP is regularly inspected every 1-3 year, including site visits
- Operator submits an annual report on emissions and operation for the supervisor to be reviewed; Air emissions are typically reported also monthly to the supervisor
- Most of the information is transferred via electronic reporting database (VAHTI)
- In a usual case, supervisor does not conduct any emission monitoring on site

# European Pollution Release and Transfer Register (Regulation (EC) No 166/2006)

- Data requirements for operators are set in E-PRTR regulation, in environmental permits and in approved monitoring procedures
- Operators report data about releases to air and waters and waste transfers to the VAHTI-data system
- Annual reporting shall be done until the end of next February
- Inspectors in environmental administration check the data and notify the operator if the data is evidently false and demand to correct it
- In Finland operators report all their releases to the environmental administration
- To EEA (European Environmental Agency) are reported only emissions which exceed threshold values E-PRTR regulation Annex II
- Finland does not have a national PRTR register



Options for operators to report emissions and waste transfers to environmental administration (The Centres for Economic Development, Transport and the Environment (ELY Centres))

The background features large, overlapping, curved shapes in shades of blue and green. A large light blue shape dominates the left and center, overlapping with a green shape on the right. A darker blue shape is visible in the overlap between the light blue and green shapes. The overall design is clean and modern.

# Thank you!

---

[jaakko.kuisma@ymparisto.fi](mailto:jaakko.kuisma@ymparisto.fi)  
[www.ym.fi](http://www.ym.fi)