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# Environmental impact assessment and environmental use in Estonia

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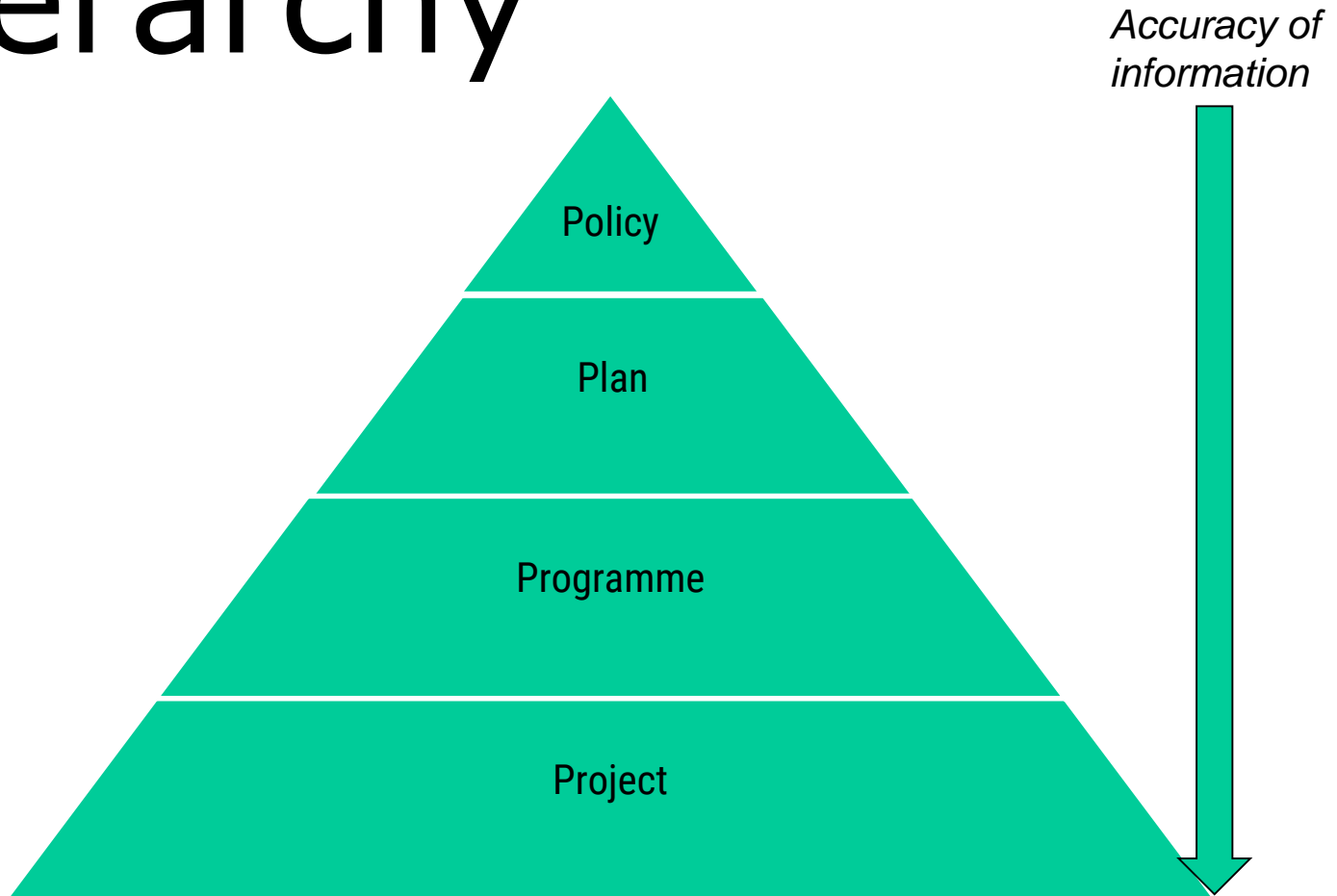
Estonian Ministry of the Environment/Director General

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# Environmental impact

- Direct or indirect impact, which causes changes in human health and well-being, in the natural environment, cultural heritage or property that results or can result from the planned activity.

# Decision making hierarchy



# Environmental impact assessment

- The systematic, reproducible and interdisciplinary assessment of the environmental impact caused by the planned activity and its realistic alternatives and the selection of the optimal alternative

# The objective of EIA/SEA

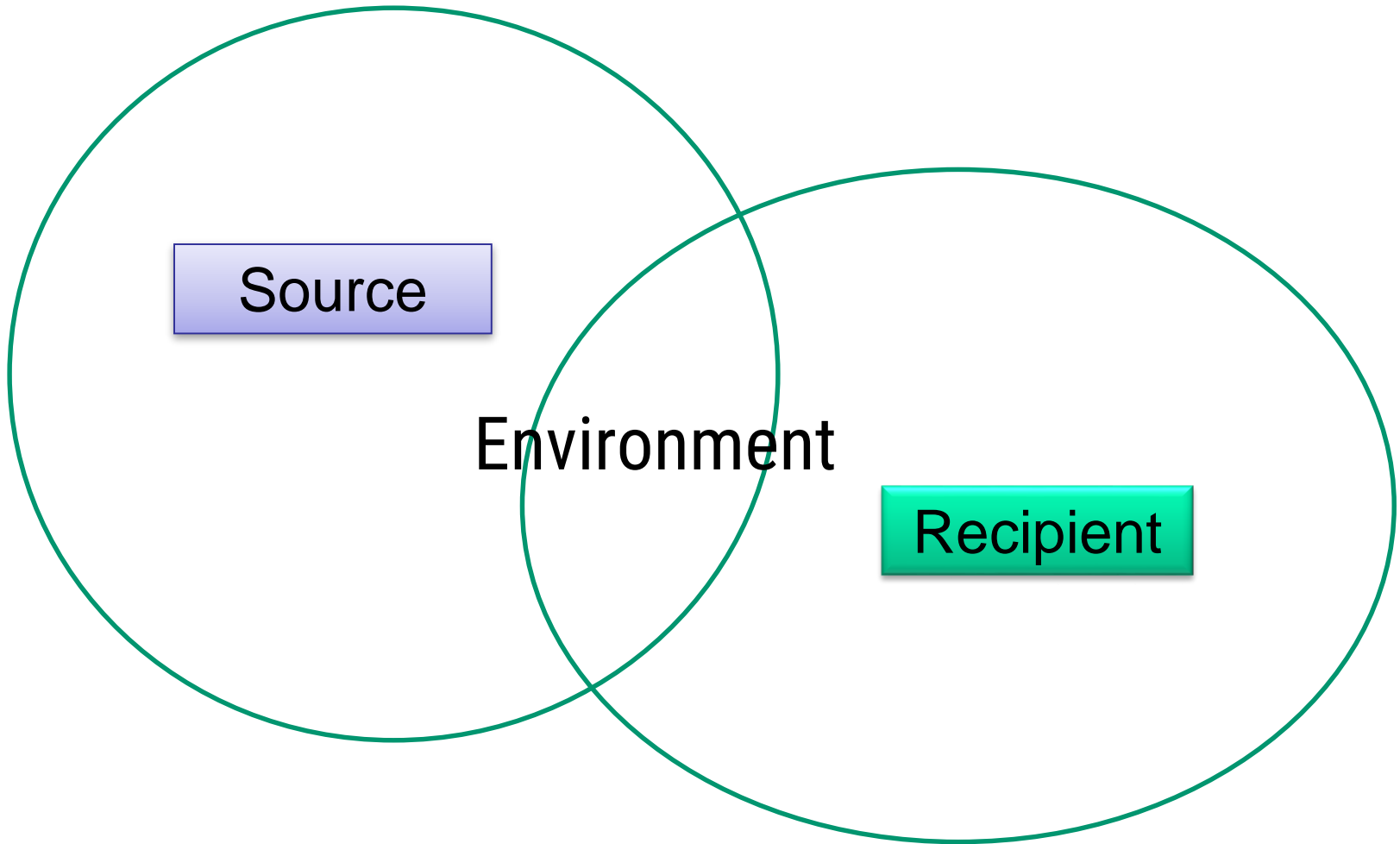
The creation of preconditions for:

- taking into account as many of all the significant impacts in decision making as possible;
- Taking into account the values of different stakeholders in decision making;
- The selection of the optimal way to reach the foreseen objective.

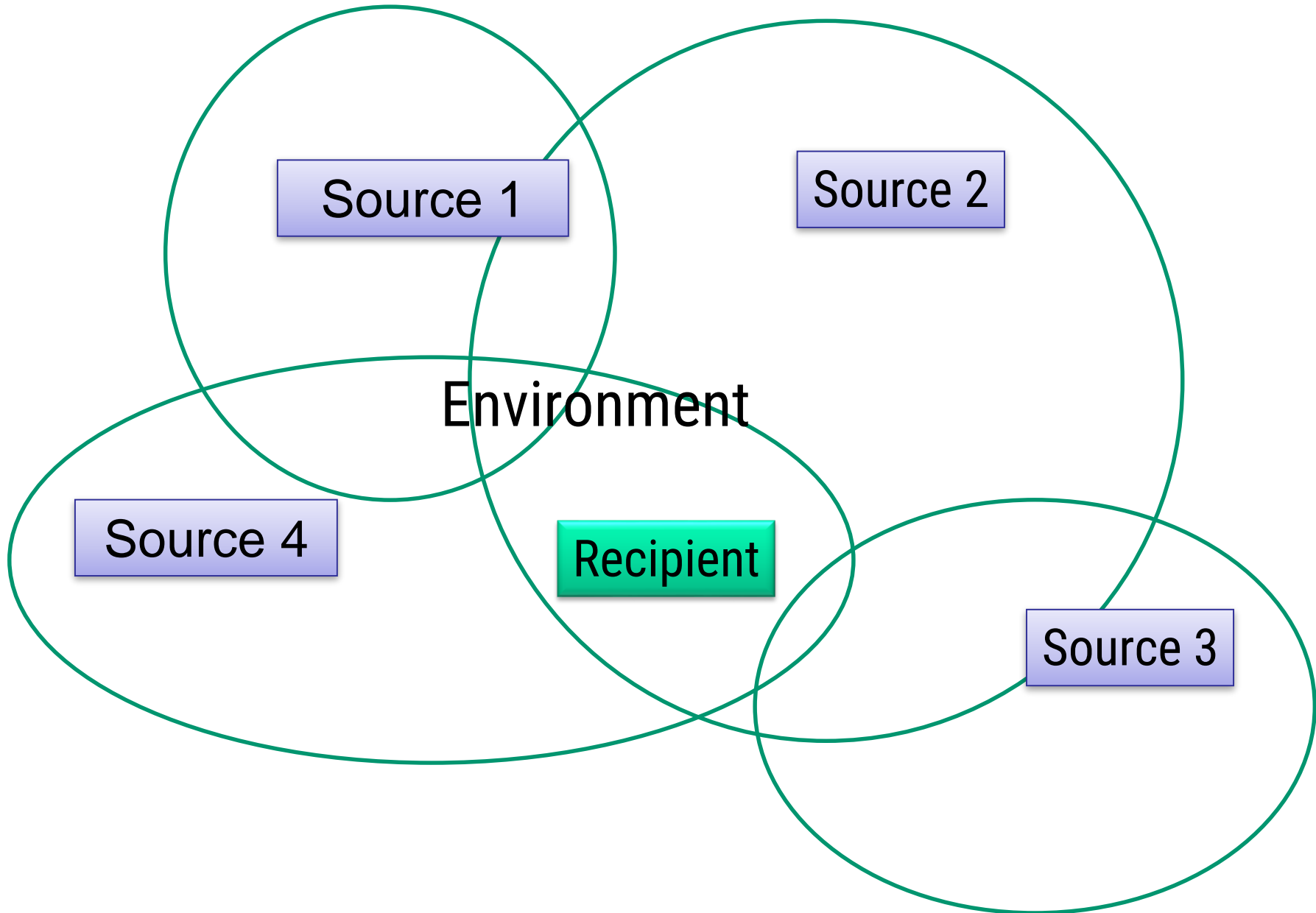
# The extent of impact assessment

- The impact is assessed in three stages:
  - Impact of construction;
  - Impact of the planned activity and
  - Impact of closure.

# Cause-effect

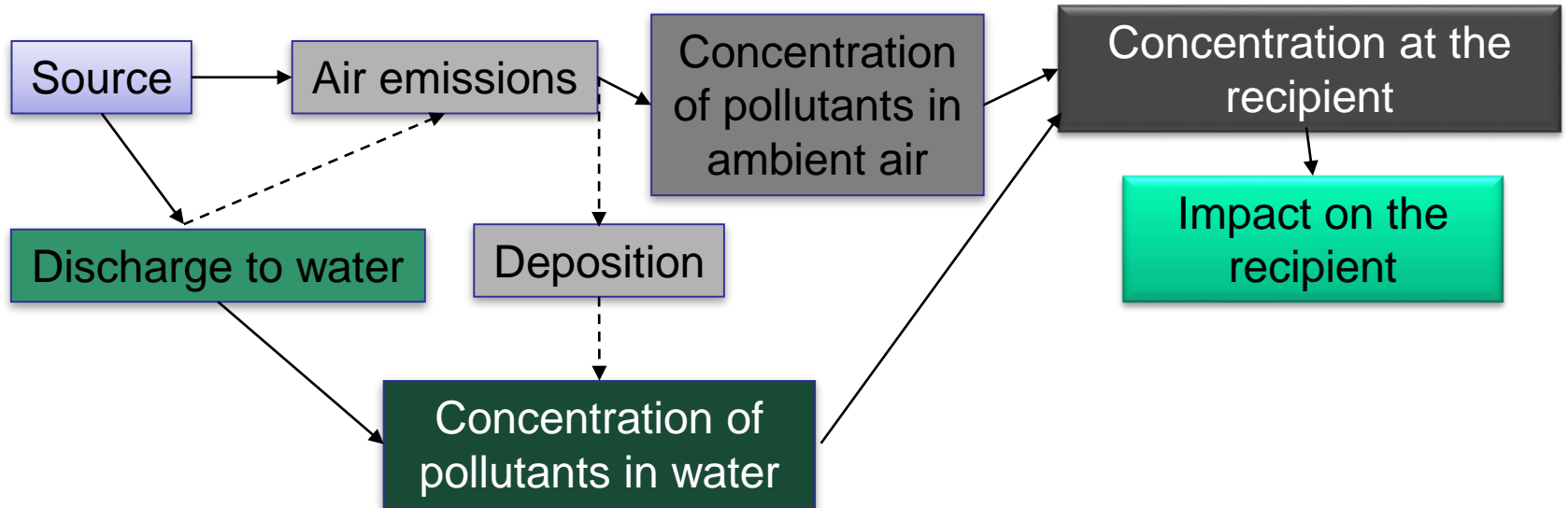


# Cause-effect





# Exposure pathway



# Uncertainty

Uncertainty caused by:

- input data (whether data from measurements or emission factors from methodologies are used);
- insufficient understanding of cause and effect relationship;
- modelling software limitations.

# The importance of environmental impact assessment

- Based on the results of the environmental impact assessment, the parameters of the accompanying impact are defined, thus the basis for the development of possible external cost is formed.

# Environmental impact assessment in Estonia

- The impact assessment in Estonia can overall be characterised by finding the level of maximum environmental impact that is still acceptable not finding the optimal alternative.
- Thus, actually only comparison with the limit values is conducted and the assessment of the other parameters of the impact is disregarded.

# Environmental use in Estonia, year 2013

**Charged emissions into the ambient air:** 1,255 mln tons of CO<sub>2</sub>, 4000 tons of volatile organic compounds, 17 000 tons of Nox, 36 000 tons of Sox, 12 000 tons of particulates;

**Mineral extraction:** 983 000 tons of peat, 2,16 mln m<sup>3</sup> of sand, 750000 m<sup>3</sup> of clay, 2,9 mln m<sup>3</sup> of limestone and dolomite, 773 000 m<sup>3</sup> of gravel, almost 16 mln tons of oil shale;

**Water abstraction:** water from mines and quarries 167 mln m<sup>3</sup>, 1,49 billion m<sup>3</sup> of cooling water, 82 mln m<sup>3</sup> of water from aquifers;

**Water pollution:** 119 tons of phosphorous compounds, 11 000 tons of suspended particles , 81 000 tons of sulphates, 1,38 tons of monophenols, 2500 tons of nitrogen compounds, 60,1 tons of oil products and 30 124 tons of other hazardous substances;

**Waste disposal:** 1,87 mln tons of mine waste from oil shale extraction, 8,3 mln tons of oil shale fly ash, 406 000 tons of oil shale semi coke, 102 000 tons of municipal and non-hazardous waste.

In the year 2006 these quantities were in some cases many times higher.

# **Most important sectors with environmental impacts**

- Oil shale industry
- Transport
- Agriculture
- Mineral extraction
- Heat production and fuel terminals

# **Oil shale industry emissions into ambient air**

SO<sub>2</sub> 34 412 tonnes

Nox 10 385 tonnes

TSP 9320 tonnes

VOC 947 tonnes

# **Transport emissions into ambient air every year**

TSP 400 tonnes

Nox 13 720 tonnes

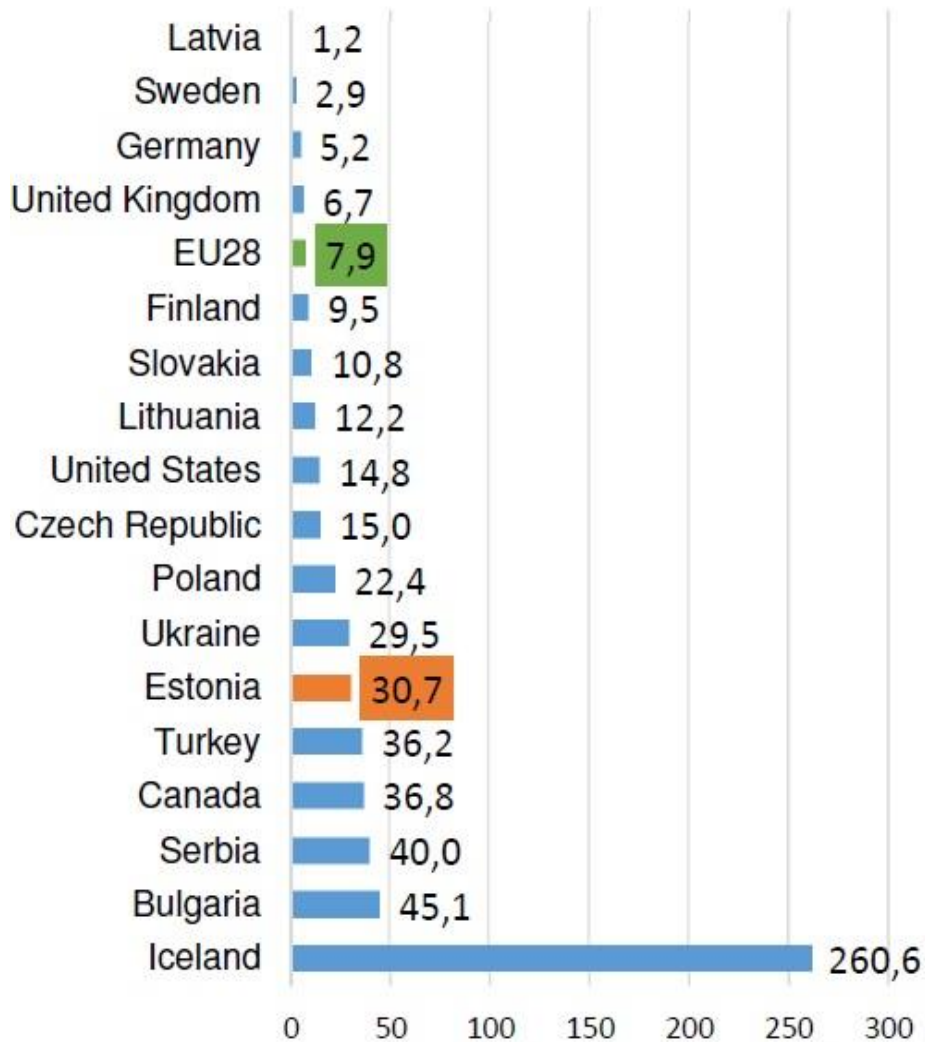
VOC 2910 tonnes

Pb 450 tonnes



# SO<sub>2</sub> and TSP emission per capita, kg

SO<sub>2</sub>



TSP



# Environmental goals

The ambient air:

- SO<sub>2</sub> – reduce emissions **32%**;
- NO<sub>x</sub> – reduce emissions **18%**,
- PM<sub>2,5</sub> – reduce emissions **15%**,
- LOU – reduce emissions **10%**,
- NH<sub>3</sub> – reduce emissions **1%**.

Water

- **The good state of all water sources**
- Cut emissions to the Baltic Sea by **1800 tons for nitrogen oxides and 320 tons for phosphorus.**

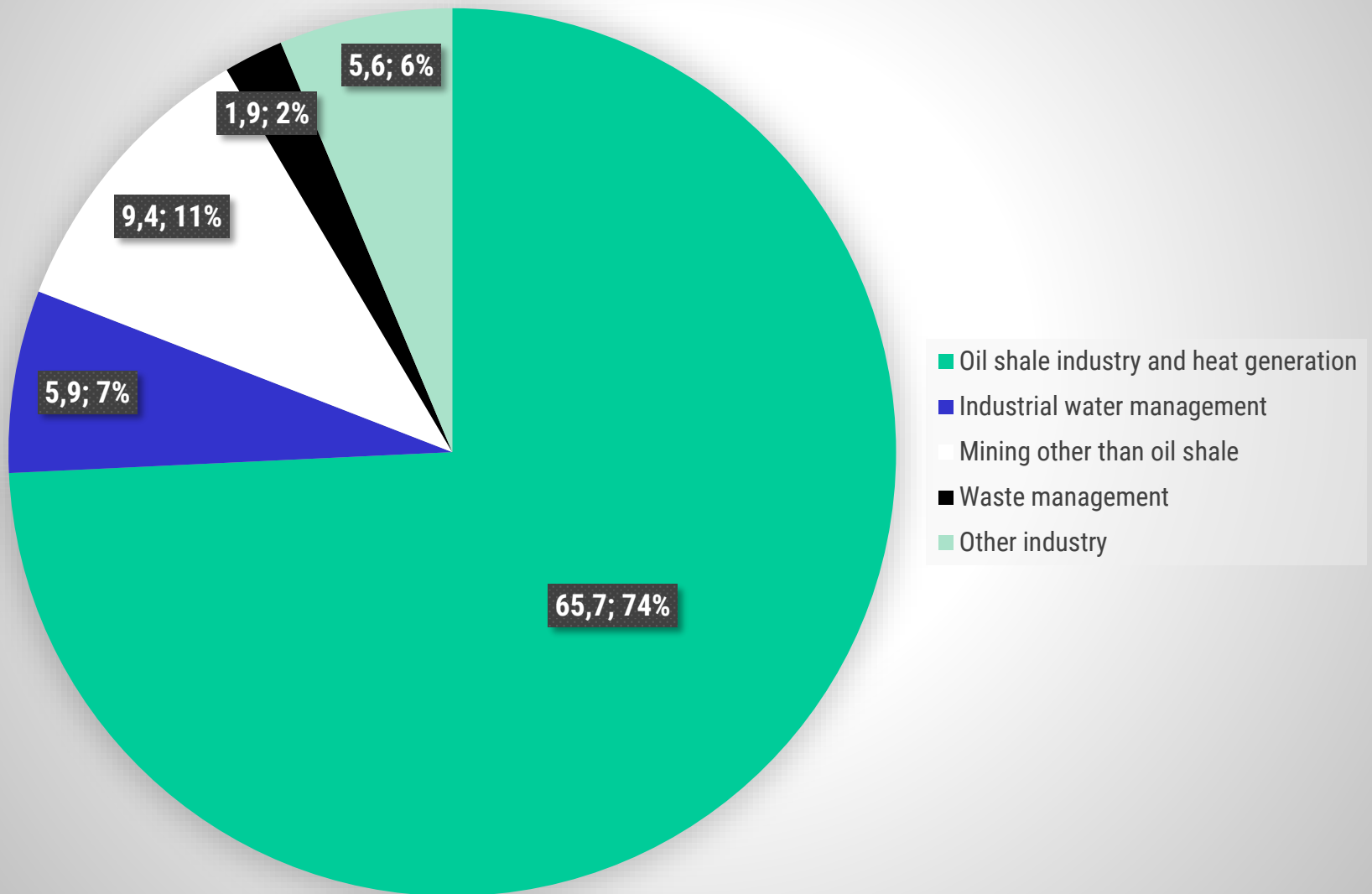
Waste

- **50%** of recycling for municipal waste

# The financial value of Estonia's environment, mln eur

Name of the programme	2010	2011	2012	2013	2015
<b>Environmental charges</b>	<b>67</b>	<b>76</b>	<b>79</b>	<b>87</b>	<b>98</b>
Thereof oil shale industry	48	55,70	54	57,6	78
...Pollution charges	22	25,08	21	22	40
...Water abstraction	8,852	8,814	8	9	9
...Oil shale	17,5	21,8	25	26,6	29,5
Environmental programme (EIC)	23	34	43	46	46
External aid (EIC)	74	149	207	195	120
Local authorities env. costs	43	41	44	54	58
<b>Societies „Value of the environment“</b>	<b>140</b>	<b>224</b>	<b>294</b>	<b>295</b>	<b>224</b>
<b>Environmental charges in value</b>	<b>48%</b>	<b>34%</b>	<b>27%</b>	<b>29%</b>	<b>44%</b>
Thereof oil shale industry	34%	25%	18%	20%	35%
Oil shale industry in environmental charges	72%	73%	69%	66%	80%

# Environmental charges paid by sector in 2013



# Future developments (2015-2019)

1. **External cost evaluation** for activities with the most environmental impacts:

- **Mining**
- **Oil shale industry as a whole**
- Water management
- Agriculture
- Transport
- Heat production and fuel terminals
- Waste management

2. **Resource pricing depending on the value generated** – **oil shale**

used for producing **oil shale oil / electricity**

# External cost evaluation

## Part I

Methodologies for the monetary evaluation of environmental impacts

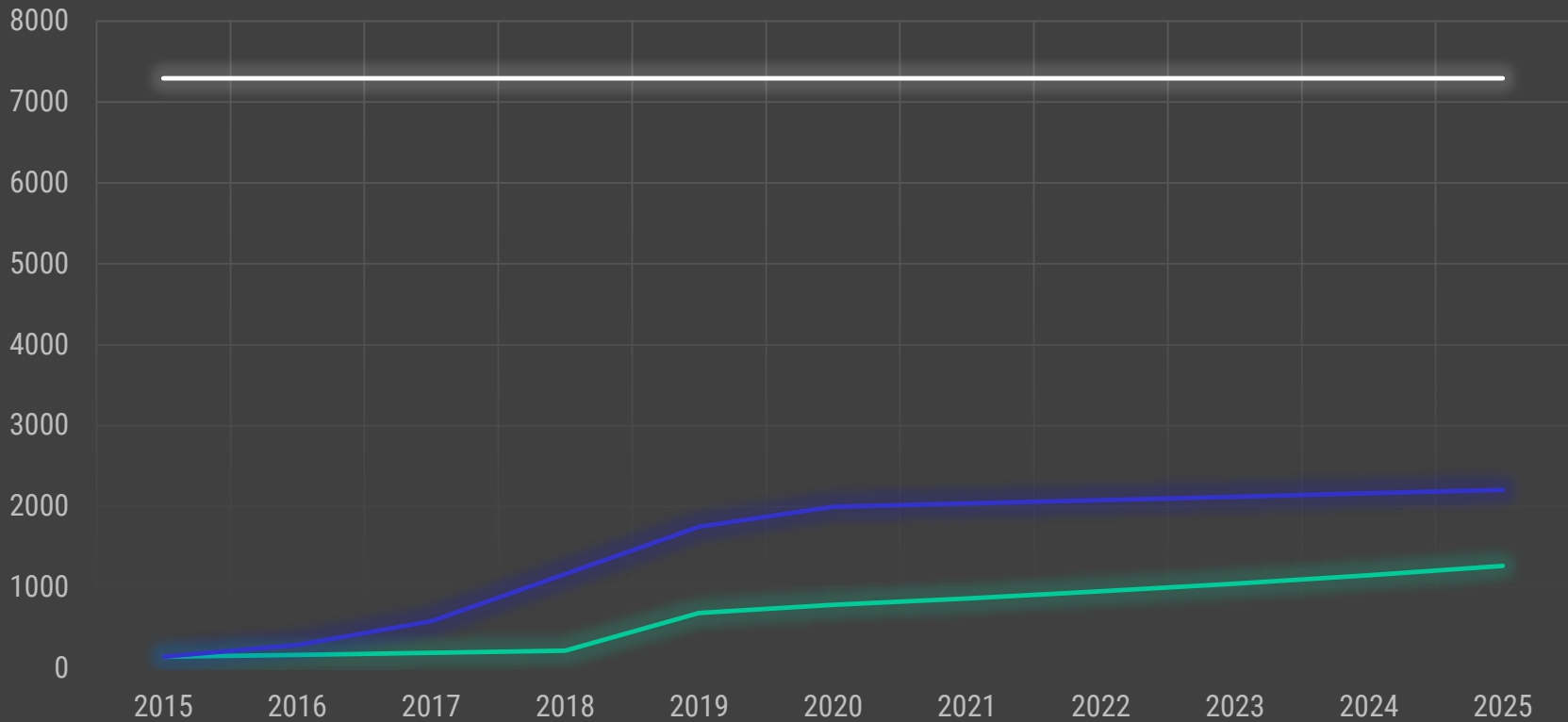
## Part II

Monetary evaluation of the impacts

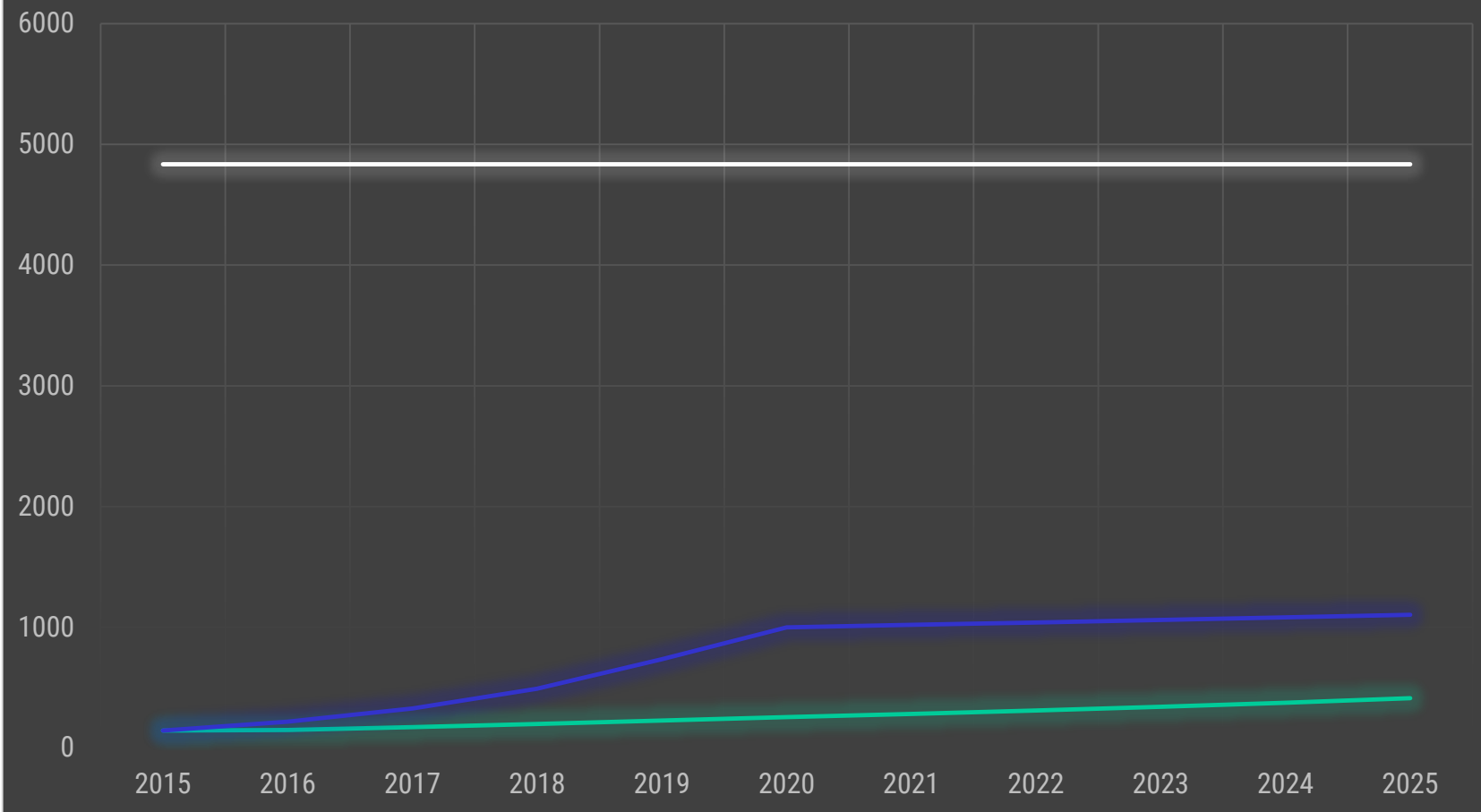
## Part III

External cost evaluation of the impacts of mining and oil shale industry

# PM10 charge rate in Estonia (green) , EC proposed charge rate (blue) and the external cost evaluation (white) of one tonne of PM10



## SO2 charge rate in Estonia, EC proposed charge rate and the external cost evaluation for one tonne of SO2







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# Thank you for your attention

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