Interim Results of the Joint SRI Atmosphere - IVL - SYKE -IIASA Project Implementation

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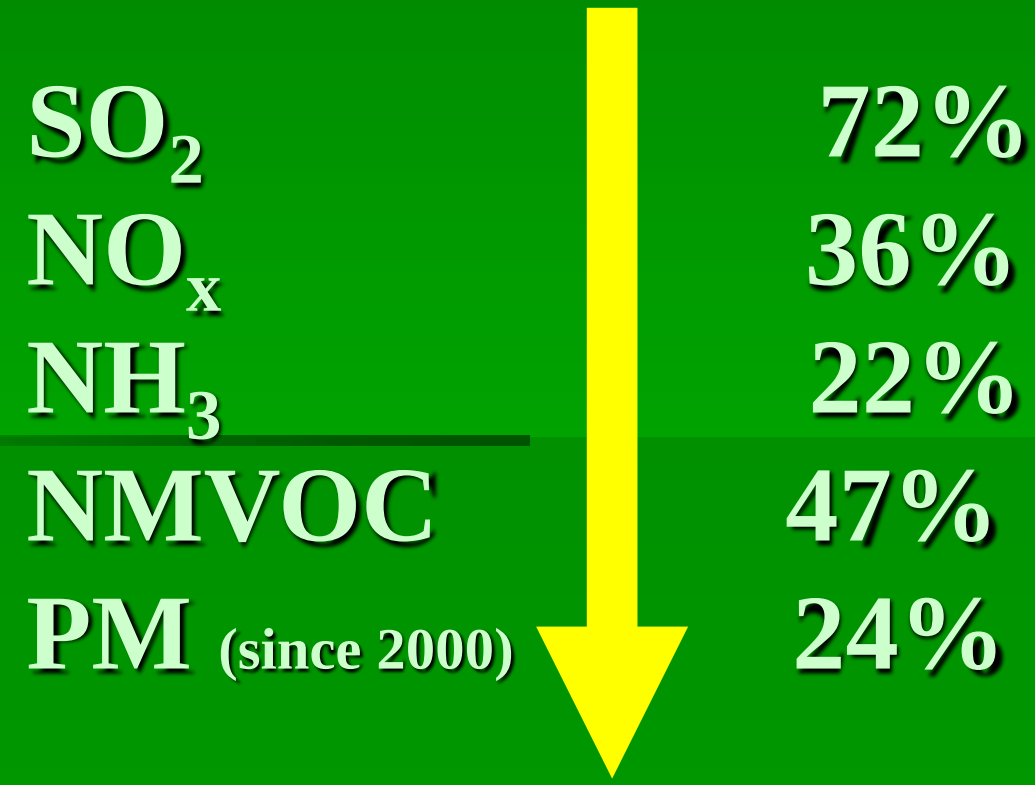
The Swedish-Finnish-Russian project «Development of the Co-operation under the Convention on Long Range Transboundary Air Pollution – CLRTAP» EP-07

Overall objective of the Project :

To increase the awareness level regarding the air pollution challenge and to strengthen the political profile of the activities carried out in Russia under the Convention.

Convention on Long-range Transboundary Air Pollution

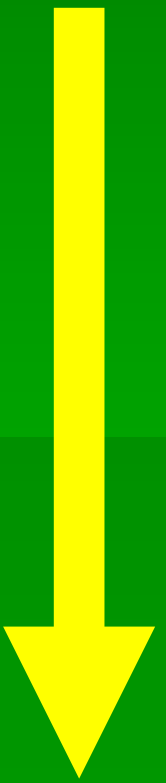
Pollutant emission reductions within EU since 1990 until 2007



SO_2	72%
NO_x	36%
NH_3	22%
NMVOC	47%
PM (since 2000)	24%

Convention on Long-range Transboundary Air Pollution

Pollutant emissions reduction at the European territory of the Russian Federation since 1990 until 2007



SO_2	65%
NO_x	5%
NH_3	53%
NMVOC	40%
PM (since 2000)	13%

Convention Protocols:

	date of signature
1. The Geneva Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP)	1984
2. The Helsinki Protocol on the Reduction of Sulphur Emissions or their Transboundary Fluxes by at least 30 per cent	1985
3. The Sofia Protocol on Persistent Organic Pollutants (POPs)	1988
4. The Geneva Protocol concerning the Control of Emissions of Volatile Organic Compounds or their Transboundary Fluxes	1991
5. The Oslo Protocol on Further Reduction of Sulphur Emissions	1994
6. The Aarhus Protocol on Heavy Metals	1998
7. The Aarhus Protocol on Persistent Organic Pollutants (POPs)	1998
8. The 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone.	1999

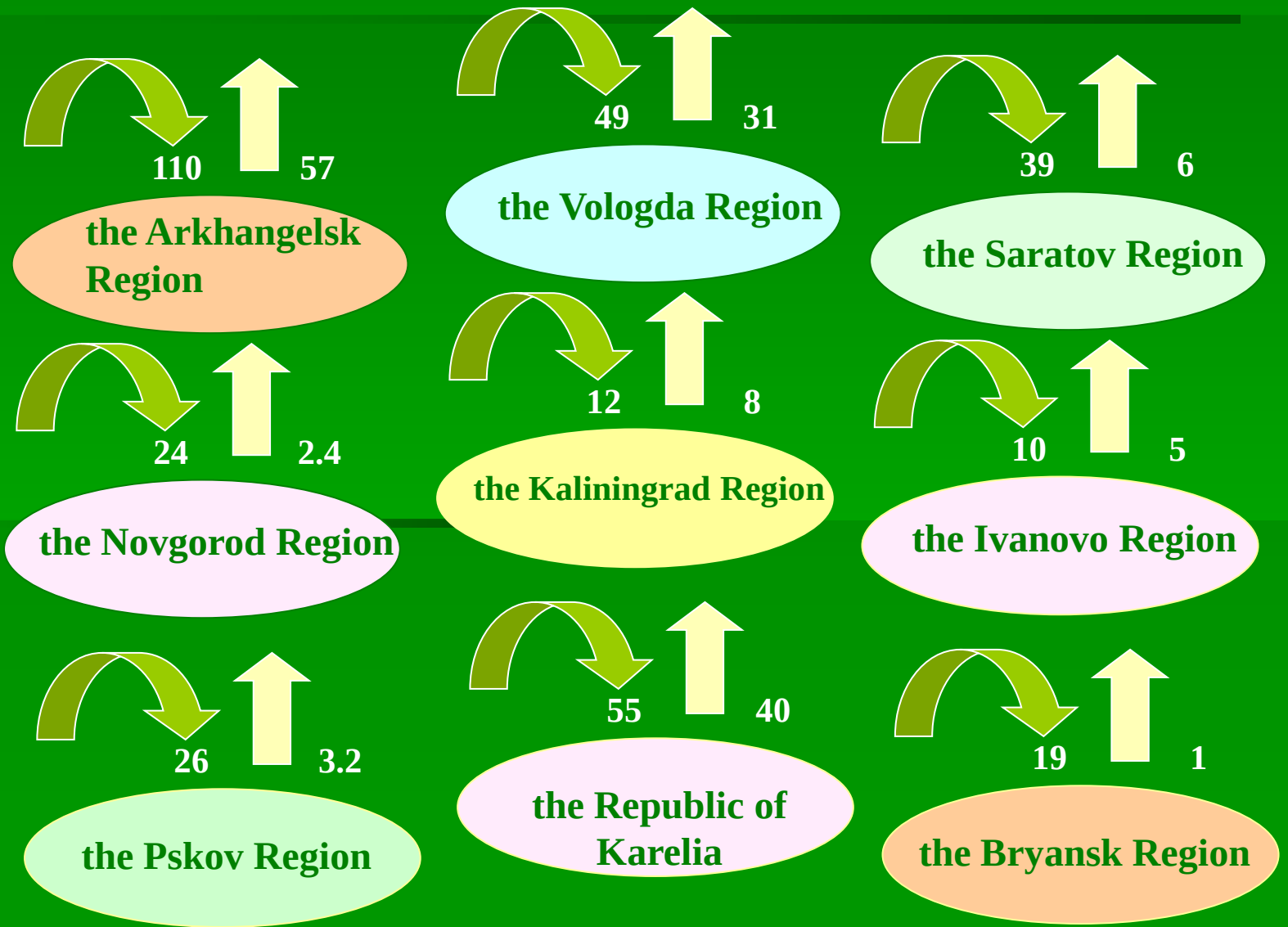
Functions of the head federal executive agency responsible for the execution of obligations under the

- Convention on Long-RangeTransboundary Air Pollution

are performed by

the Ministry of Natural Resources and Environmental Protection of the Russian Federation

Comparison of the total S emission fluxes at the territory of RF subjects (th. tonnes)



GAINS Model
The Greenhouse Gas and Air Pollution Interactions and Synergies Model

is a tool which is used in order to analyze an environmental impact of various economical scenarios, as well as to assess the efficiency of various pollutant and greenhouse gases reduction scenarios.

Model developer

International Institute for Applied Systems Analysis

IIASA

The list of substances considered in the GAINS Model

Pollutants	Greenhouse gases
PM	**CO_2**
SO_2	**CH_4**
NO_x	**N_2O**
VOC	**HFCs**
NH_3	**PFCs**
	SF_6

Practical purposes of the given project

are the following:

1. To study the possibility of the GAINS Model application for the ecologico-economical optimization of business and other activities in the Russian Federation.
2. To develop the Russian GAINS Module

GAINS EUROPE

(previous version)

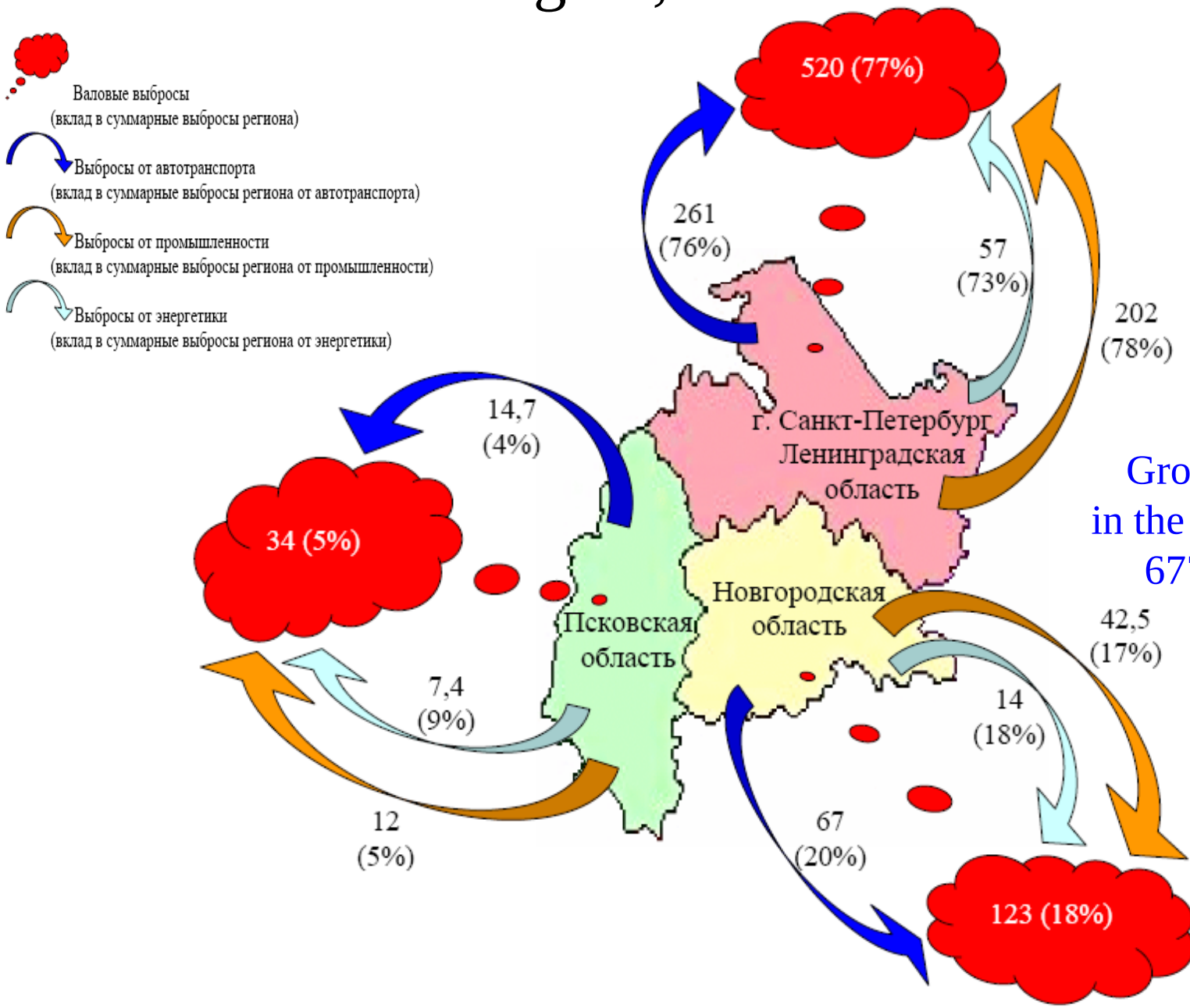
The Russian Federation
has been presented by the following regions:

- Russia, Kaliningrad
- Russia, Kola and Karelia
- Russia, St. Petersburg
- Russia, Remaining

Region
Russia, St. Petersburg (SPET)

Region
Russia, Kola and Karelia

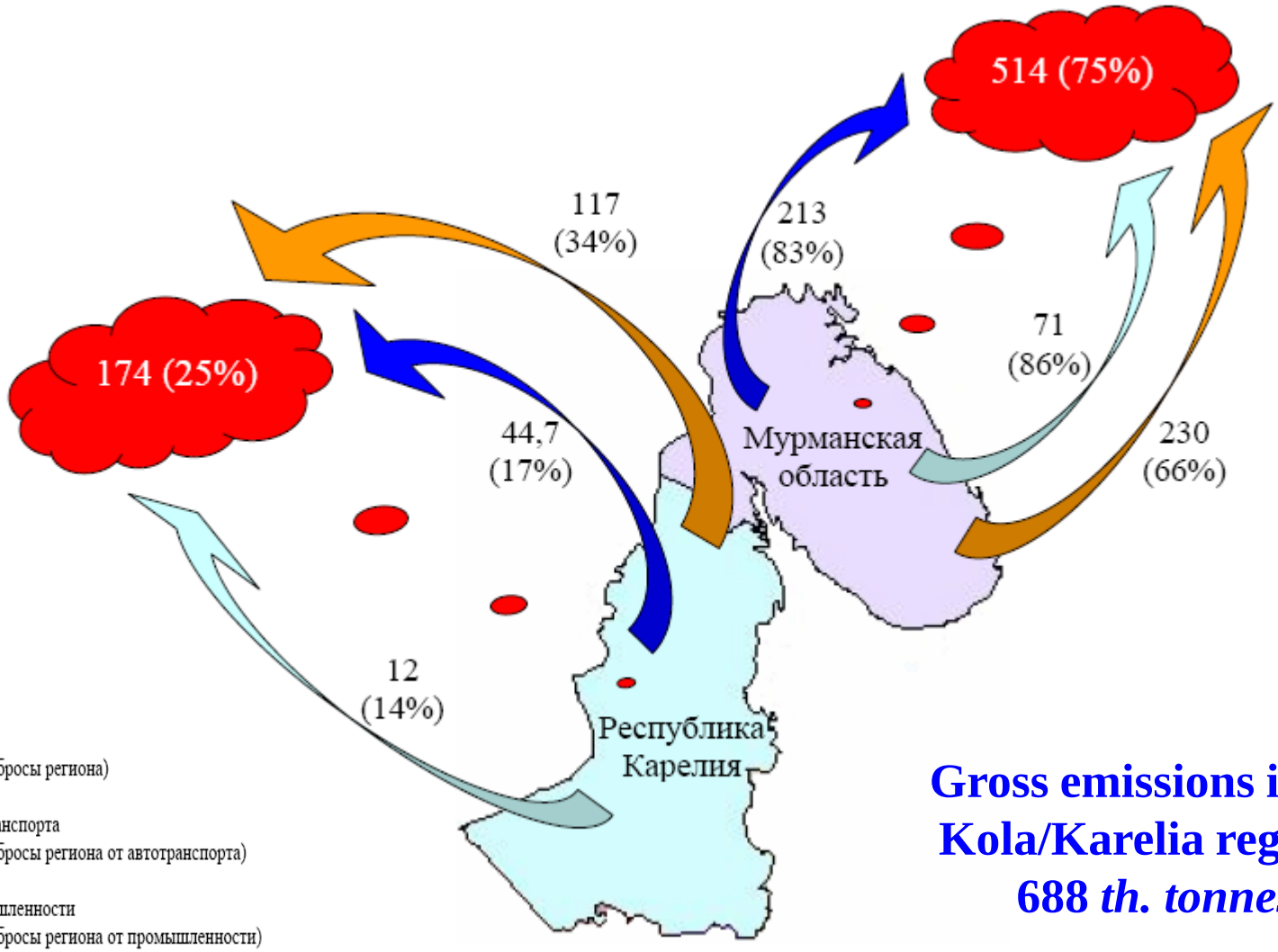
Pollutant emissions in the subjects of the SPET region, *th. tonnes*



Gross emissions in the SPET region - 677 *th. tonnes*

Pollutant emissions in the subjects of the Kola/Karelia region,

th. tonnes

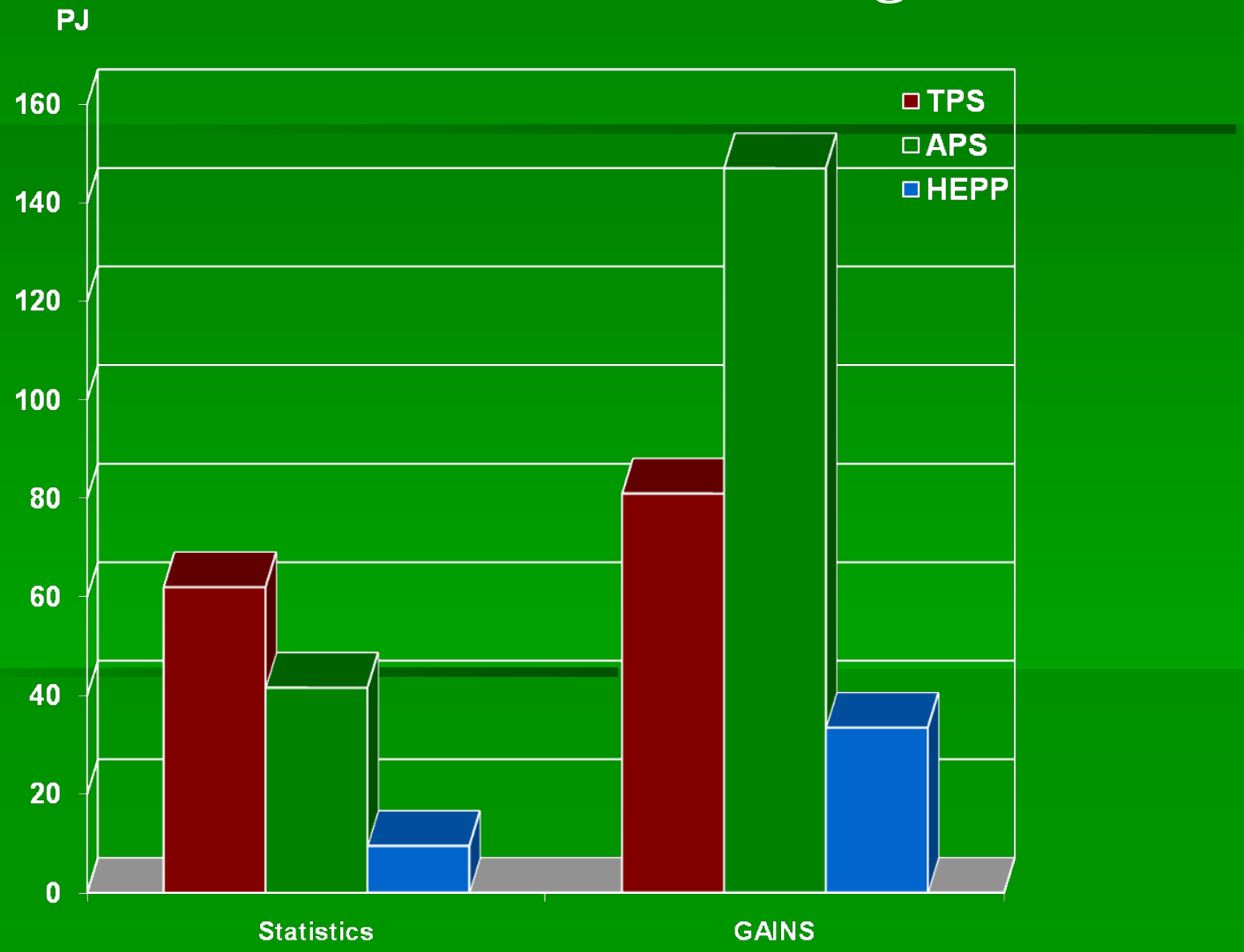


Gross emissions in the Kola/Karelia region - 688 *th. tonnes*

HP ProLiant ML150 Generation 5 (G5) Server

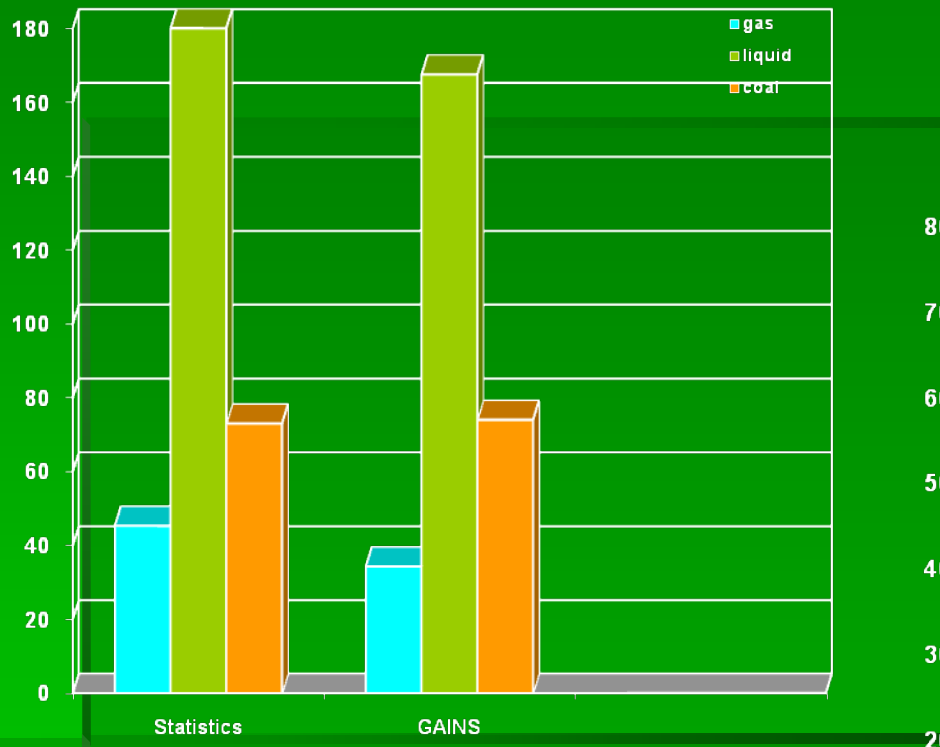
(470064-718)

Electricity generation in the Kola/Karelia region

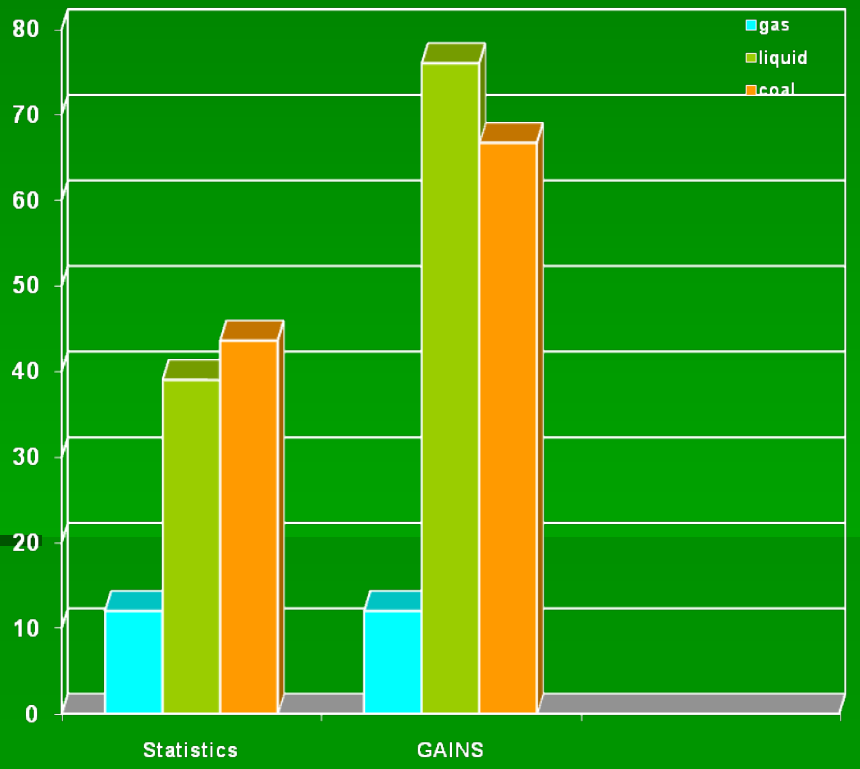


Data presented in GAINS are overestimated regarding APS and HEPP - by 3,5 times, regarding TPS - by 1.3 times.

Consumption of primary FPR in the Kola/Karelia region

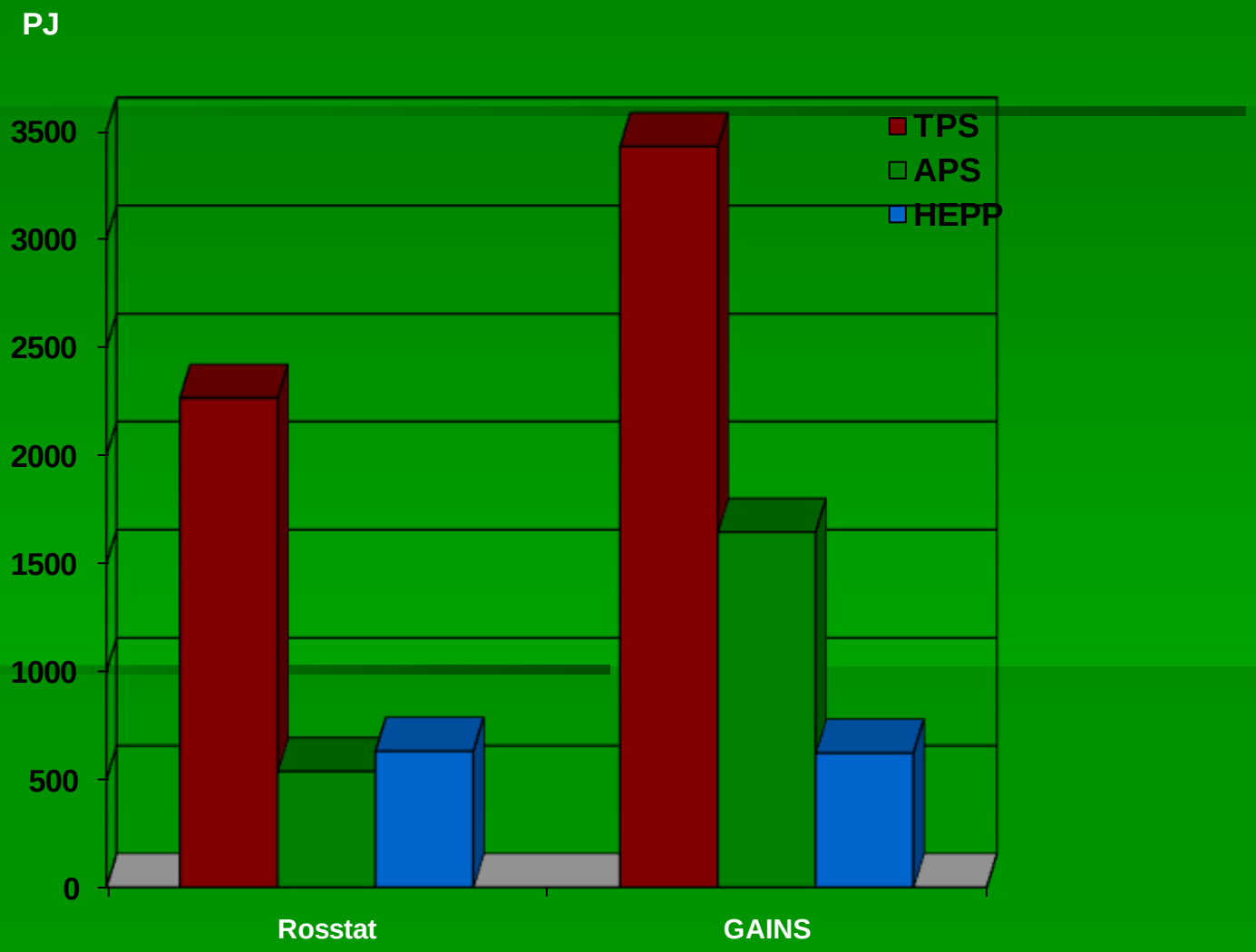


Domestic consumption, PJ



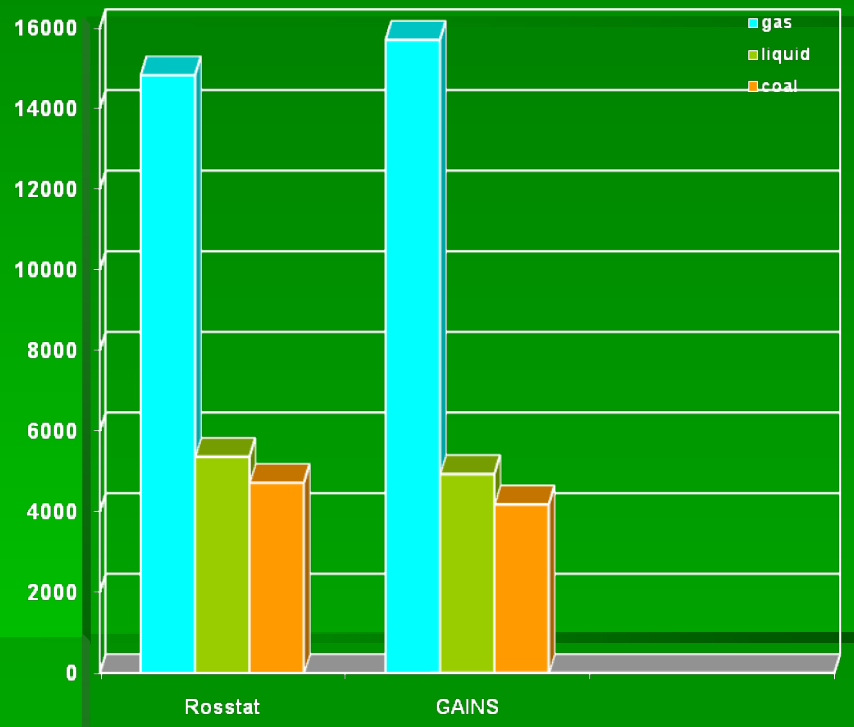
Energy consumption by power plants, PJ

Electricity generation in the Russian Federation

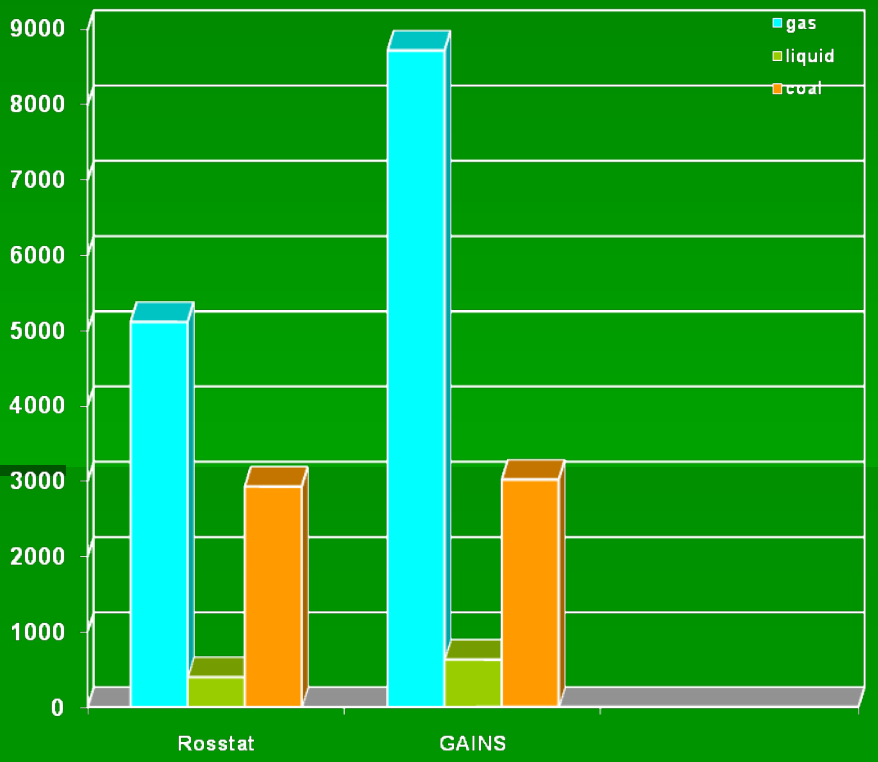


Data presented in GAINS are overestimated regarding TPS - by 34%, APS - by 67%.

Consumption of primary FPR in the Russian Federation



Domestic consumption, PJ



Energy consumption by power plants PJ

The Control Strategy

developed by IIASA for the Russian regions

includes the following measures:

❖ Concerning motor transport:

- Euro I at 100% of trucks equipped with petrol engines
- Euro II at 8% of passenger cars equipped with petrol engines and at 8% of trucks with diesel engines
- Euro III at 16% of passenger cars equipped with petrol engines and at 16% of trucks with diesel engines

❖ As for NOx emissions:

- measures aimed at the incineration process improvement are being introduced at 8% of sources.

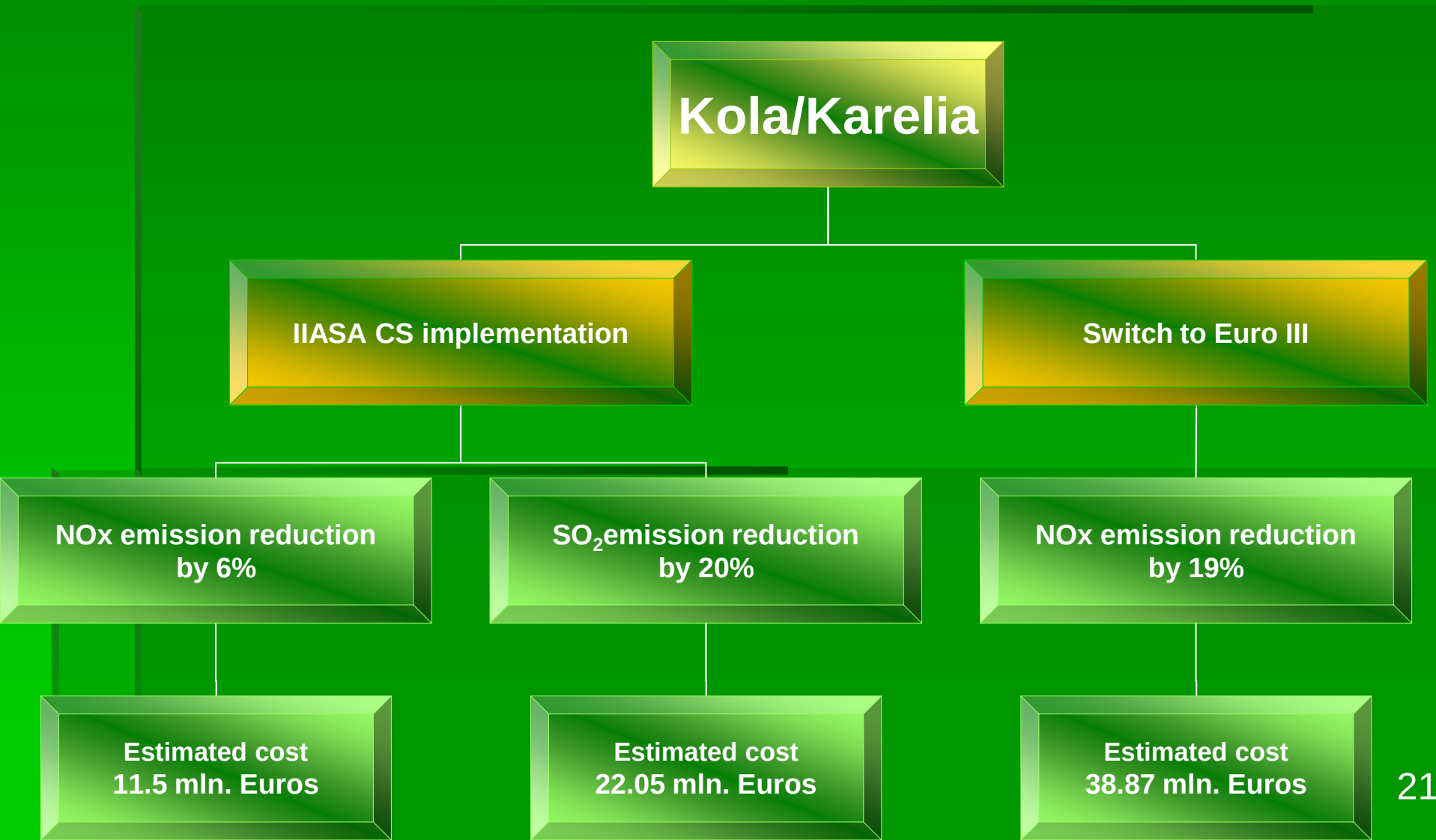
❖ As for SO_2 emissions:

a) Wet Flue Gas Desulfurization:
- in industry:
  - when using coal - at 8% of sources;
  - when using residual oil - at 20% of sources.
- in energy sector - at 50% of sources for all fuel types,

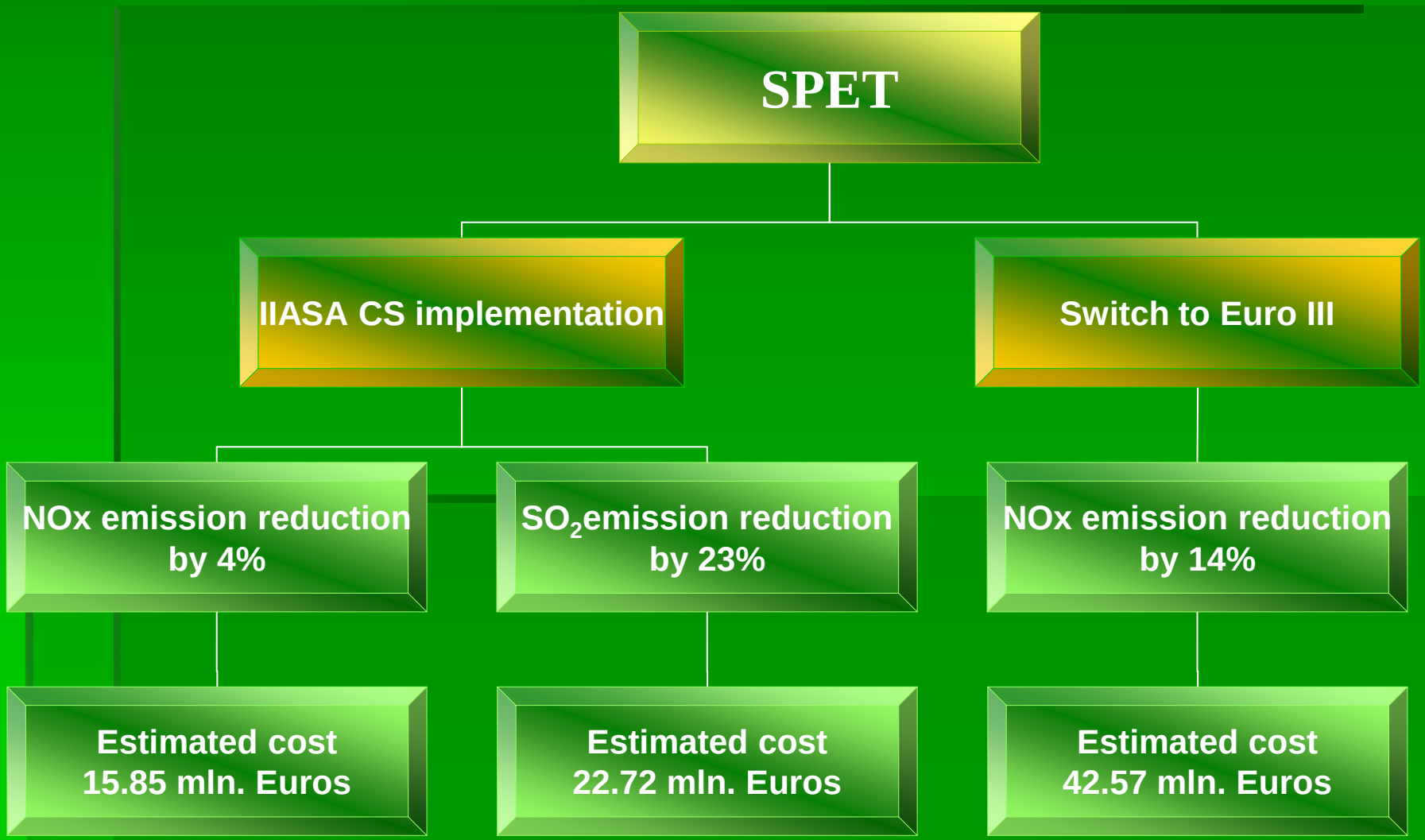
b) low sulfur diesel fuel – 0,2% S (other than motor transport).

c) as for motor transport - diesel fuel with a sulfur content equal to 0,045% S.

Review of the control strategy implementation effects in the Kola/Karelia region



Review of the control strategy implementation effects in the SPET region



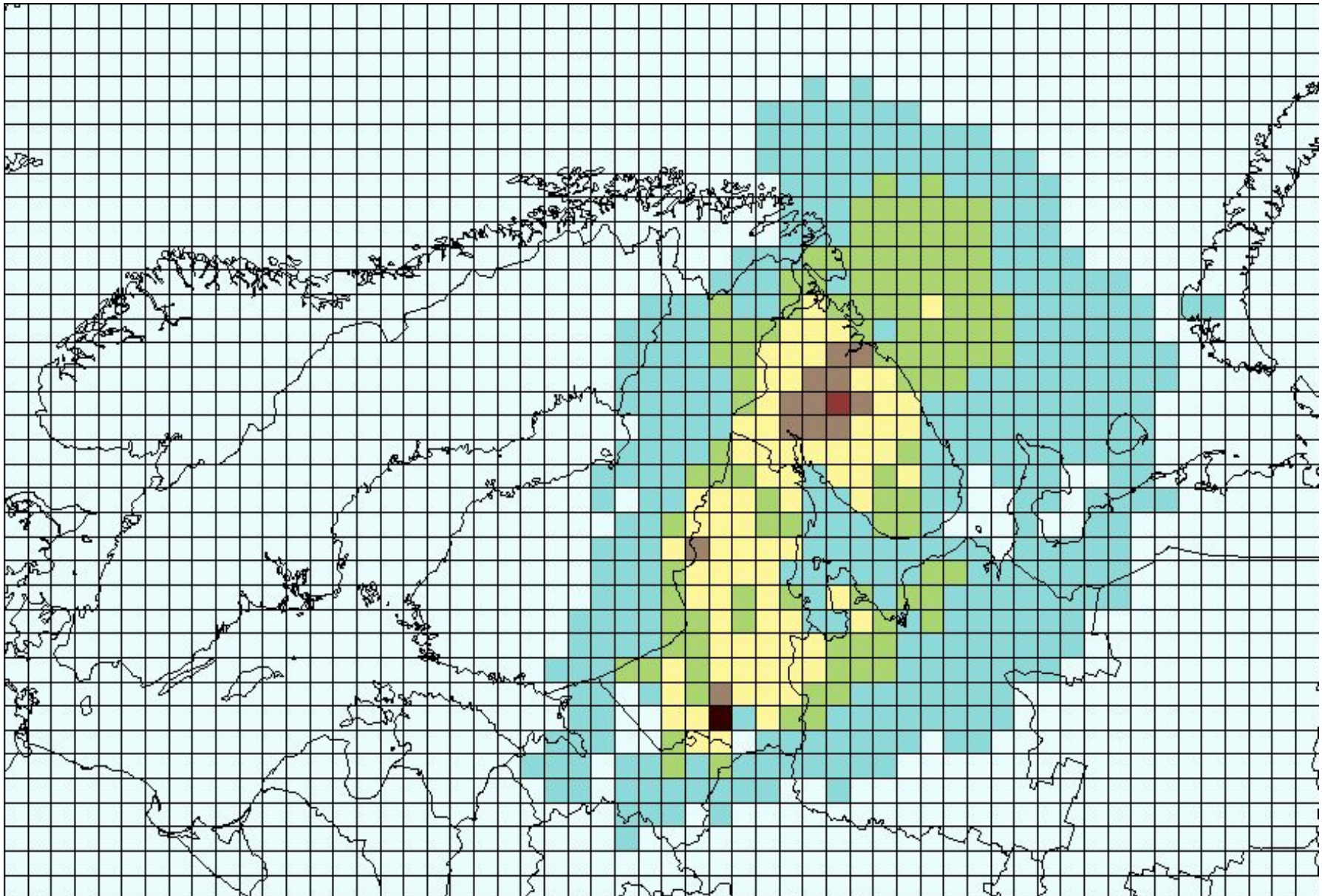
Calculation results for pollutant emissions in the Kola/Karelia region

using IIASA control strategy

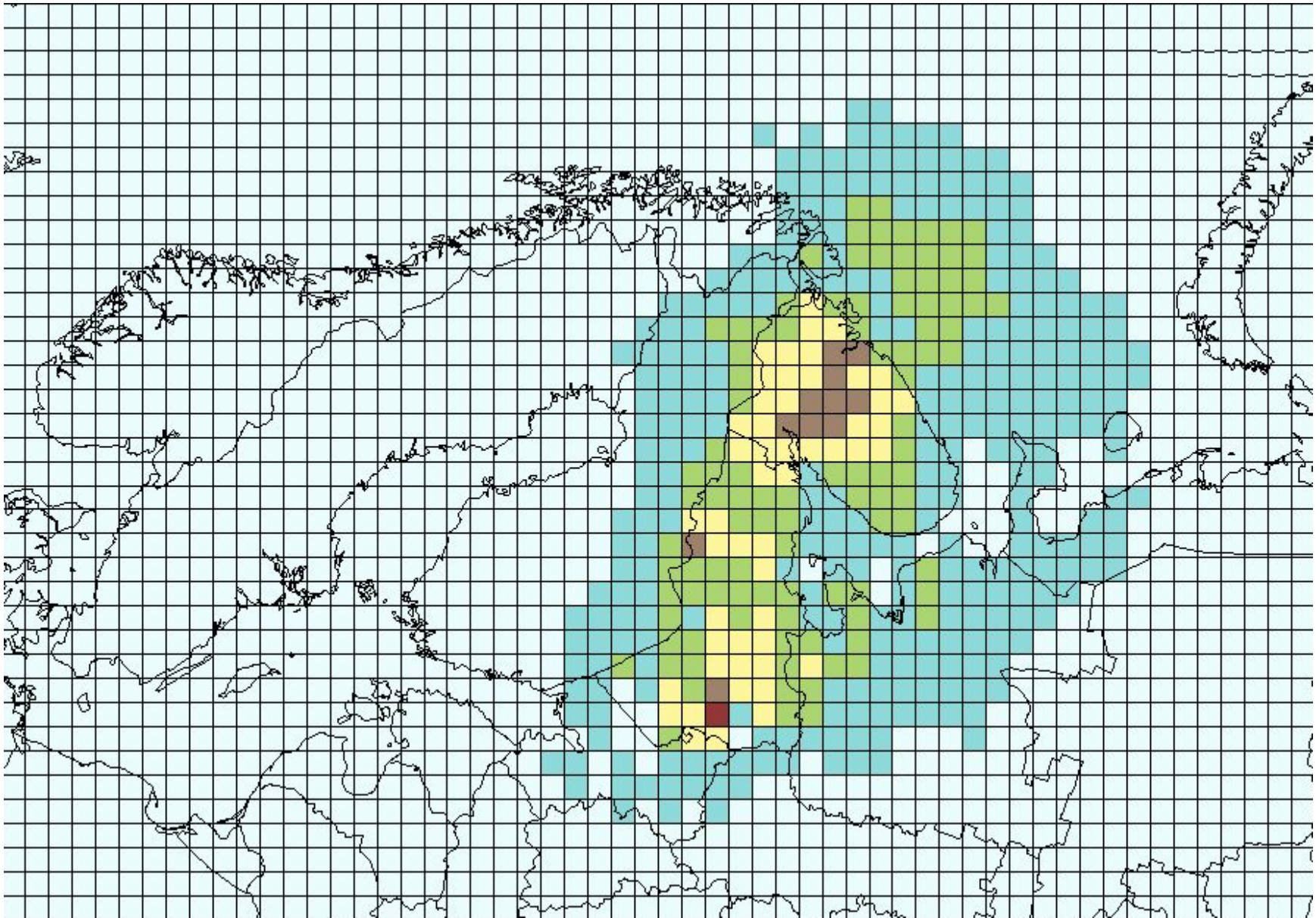
Category	IIASA data	SRI "Atmosphere" data	National inventory data
SO_2, *th. tonnes*			
Motor transport	**8.3**	**11.6**	**10.8**
Energy sector	**252.4**	**77.5**	**86.6**
Industry	**19.3**	**94.7**	**192.7**
Domestic sector	**5.3**	**7.3**	**4.2**
Other	**0.04**	**0.04**	**3.8**
Totals	**285,4**	**191.2**	**298.1**
NOx, *th. tonnes*			
Motor transport	**59.8**	**27.1**	**31,6**
Energy sector	**28.4**	**16.5**	**8,0**
Industry	**4.1**	**20.4**	**12,3**
Domestic sector	**1.2**	**1.5**	**0,9**
Other	**0.04**	**0.5**	**0,2**
Totals	**93.5**	**66.0**	**53.0**

Review of NOx depositions from the Kola/Karelia region with/without control strategies implementation

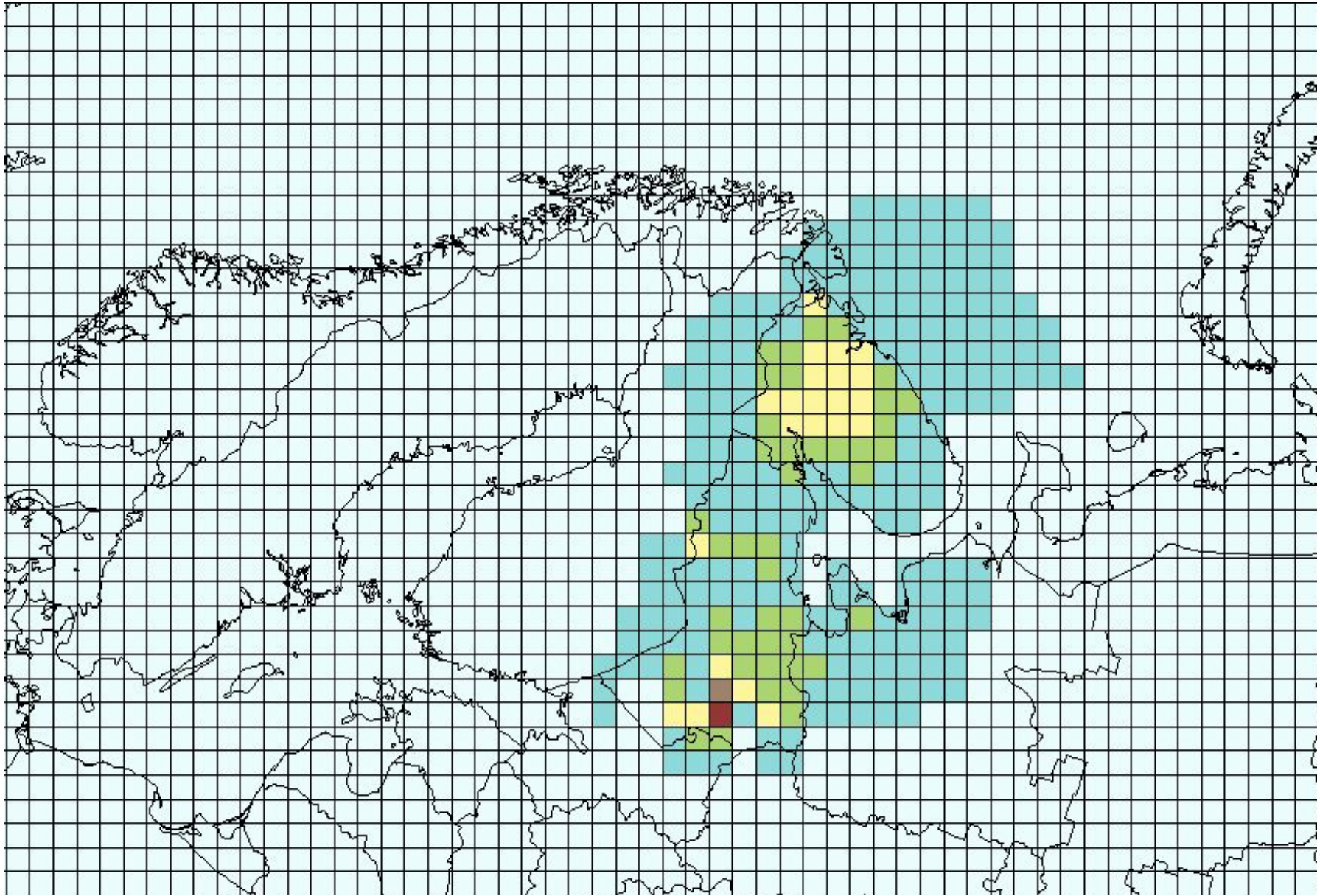
NOx depositions from the Kola/Karelia region without CS implementation, mgN/m²



NOx depositions from the Kola/Karelia region after IIASA CS implementation, mgN/m^2

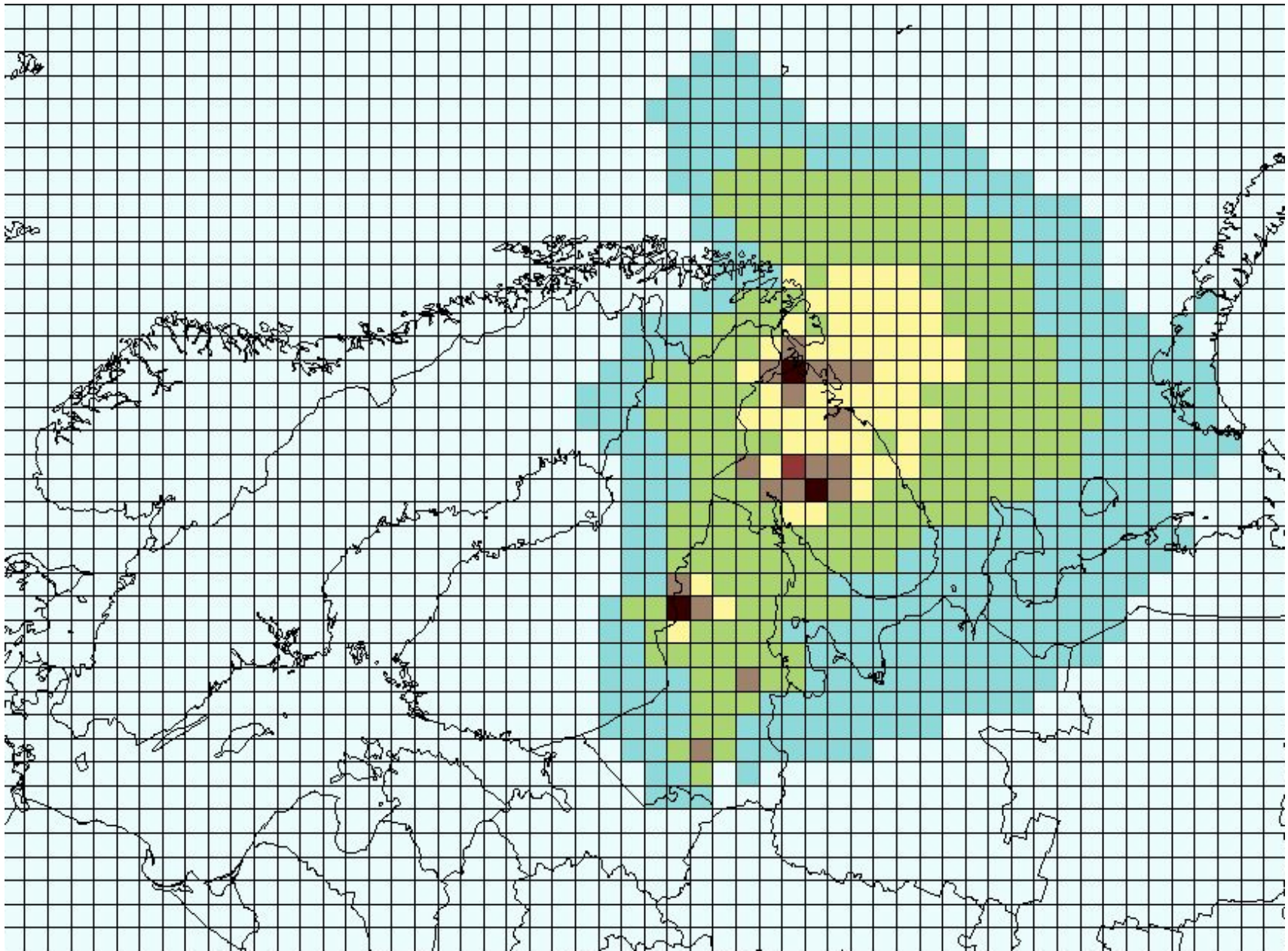


NOx depositions from the Kola/Karelia region after a switch to Euro 3, mgN/m²

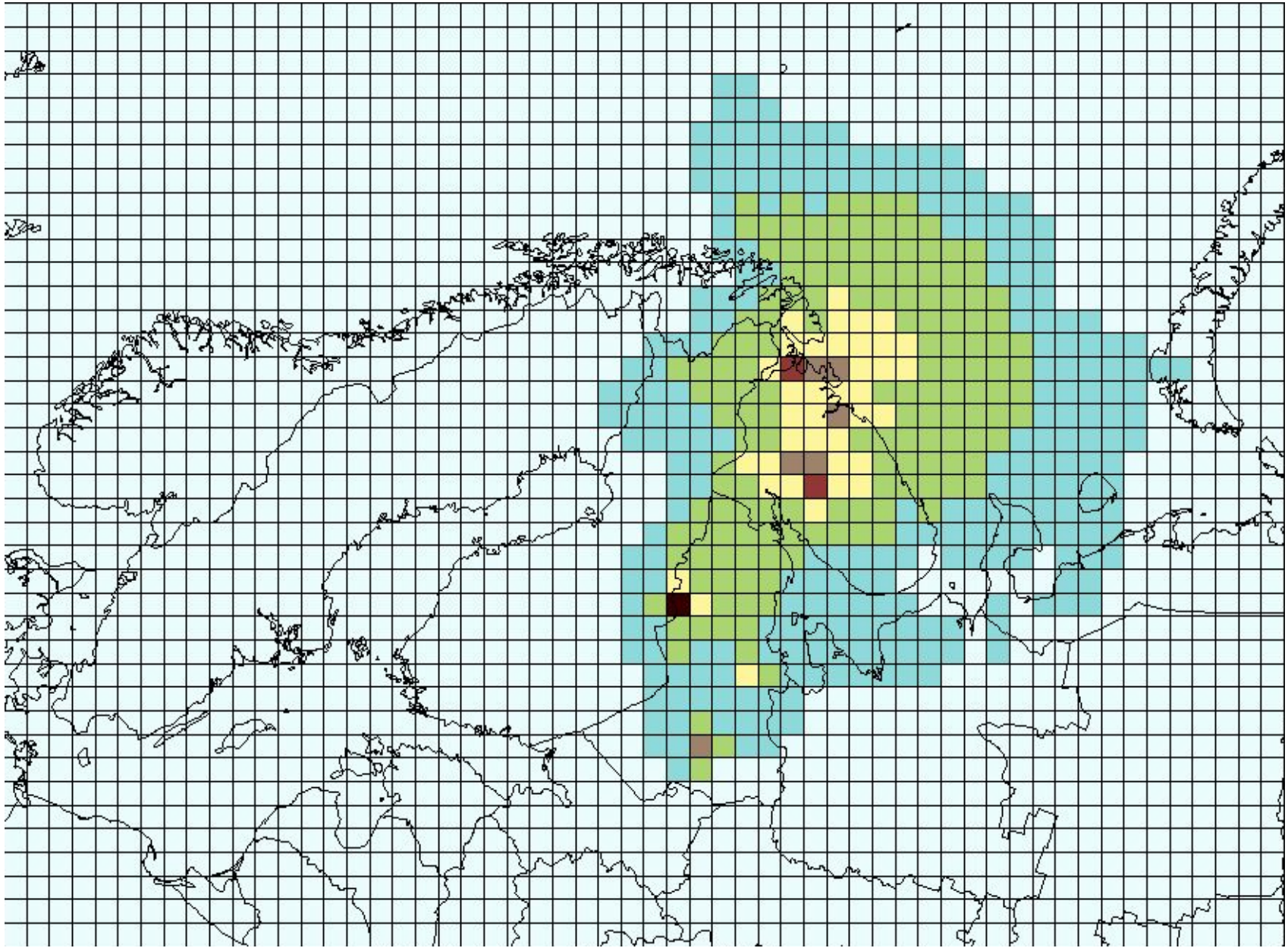


Review of SOx depositions from the Kola/Karelia region with/without control strategies implementation

SOx depositions from the Kola/Karelia region without CS implementation, mgS/m^2

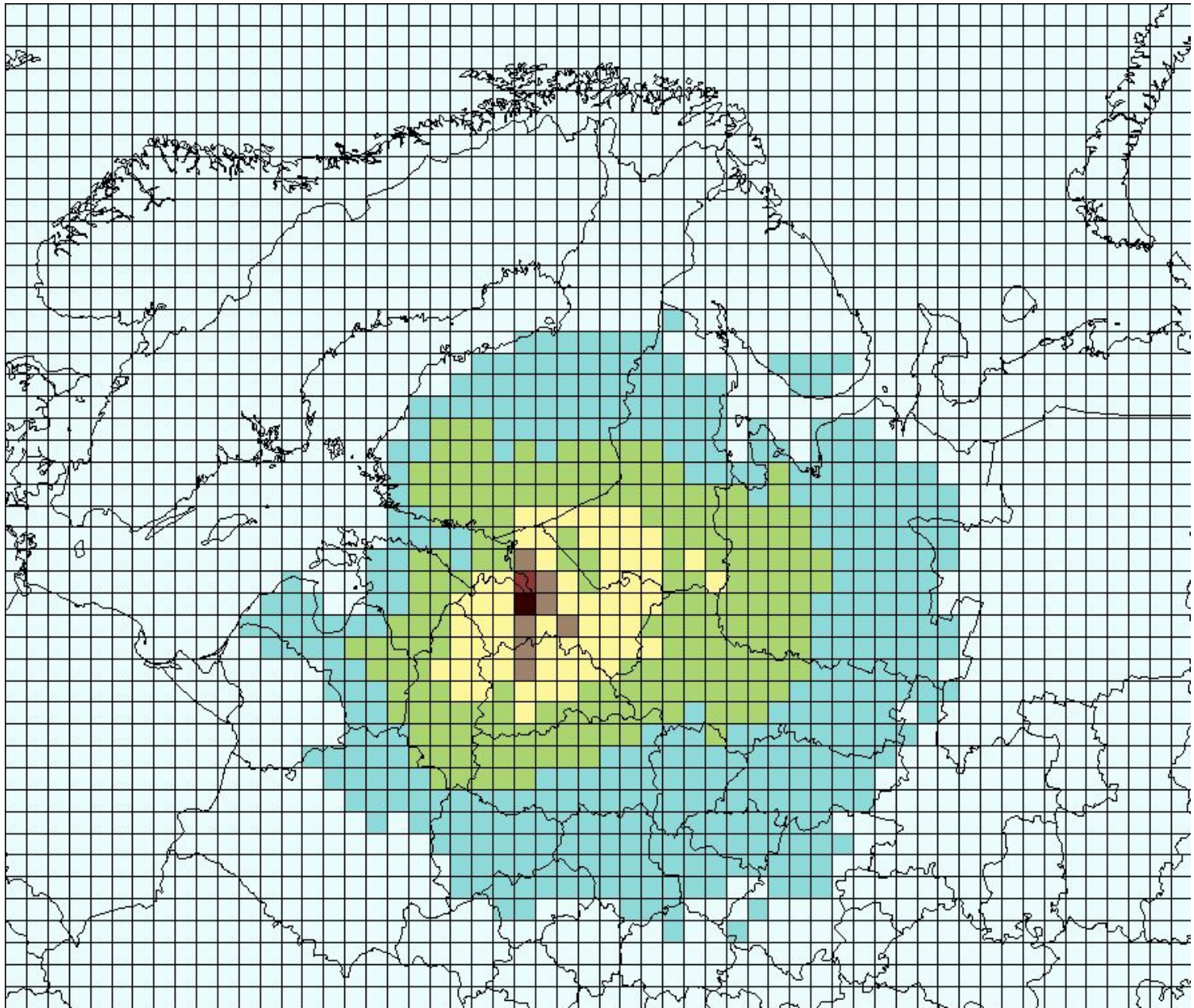


SOx depositions from the Kola/Karelia region after IIASA CS implementation, mgS/m²

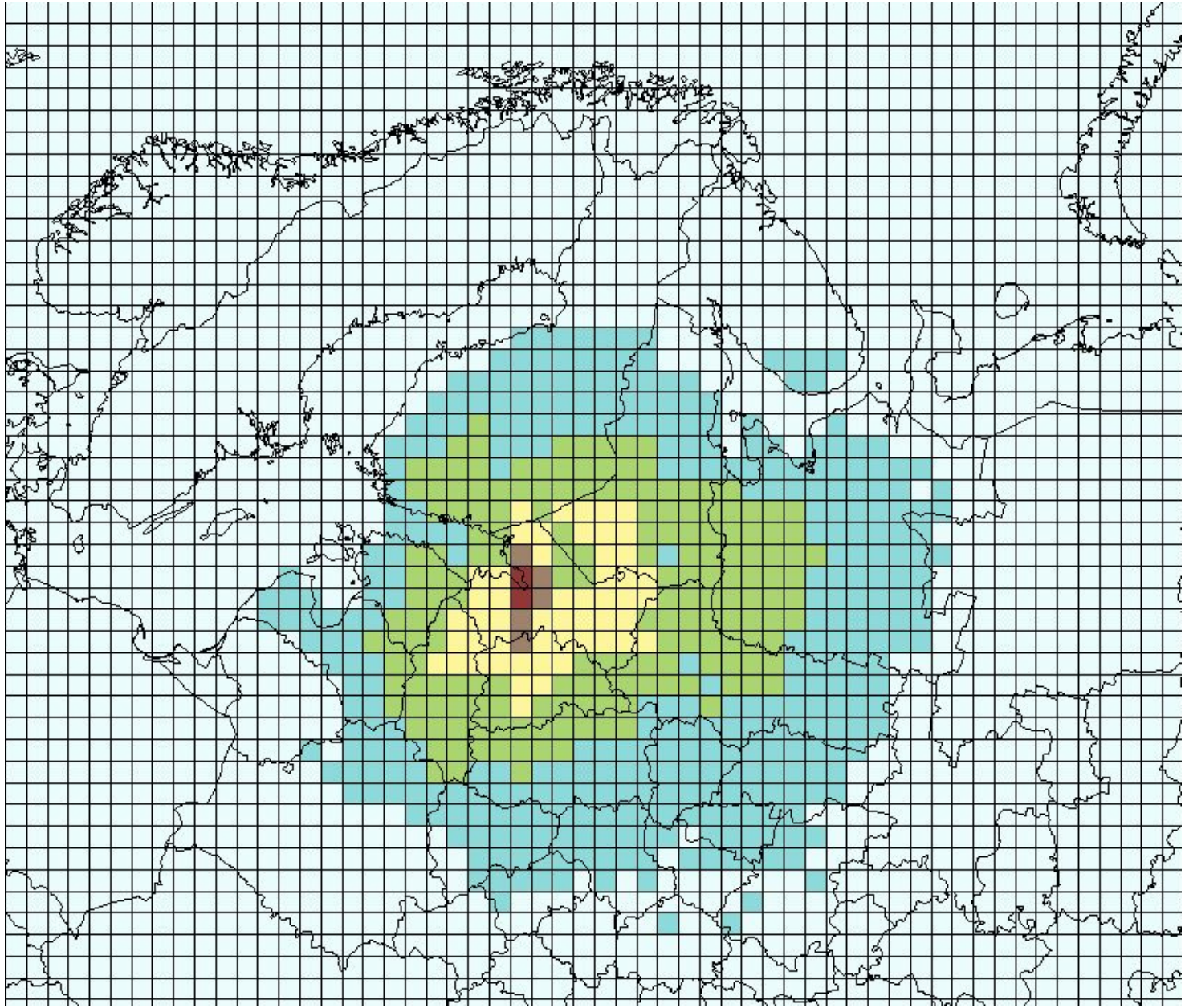


Review of NOx depositions from the SPET region with/without control strategies implementation

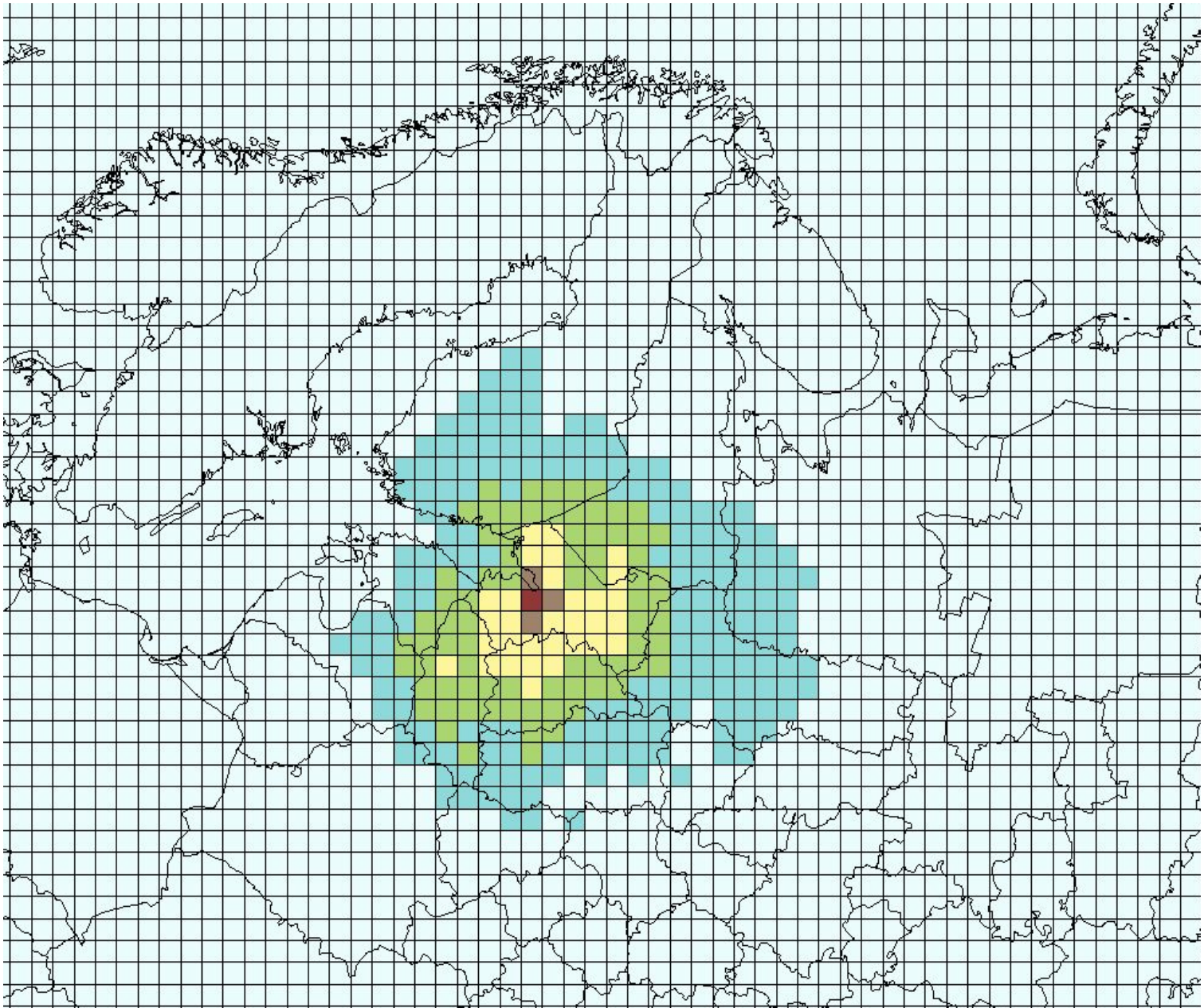
NOx depositions from the SPET region without CS implementation, mgN/m^2



NOx depositions from the SPET region after IIASA CS implementation, mgN/m^2

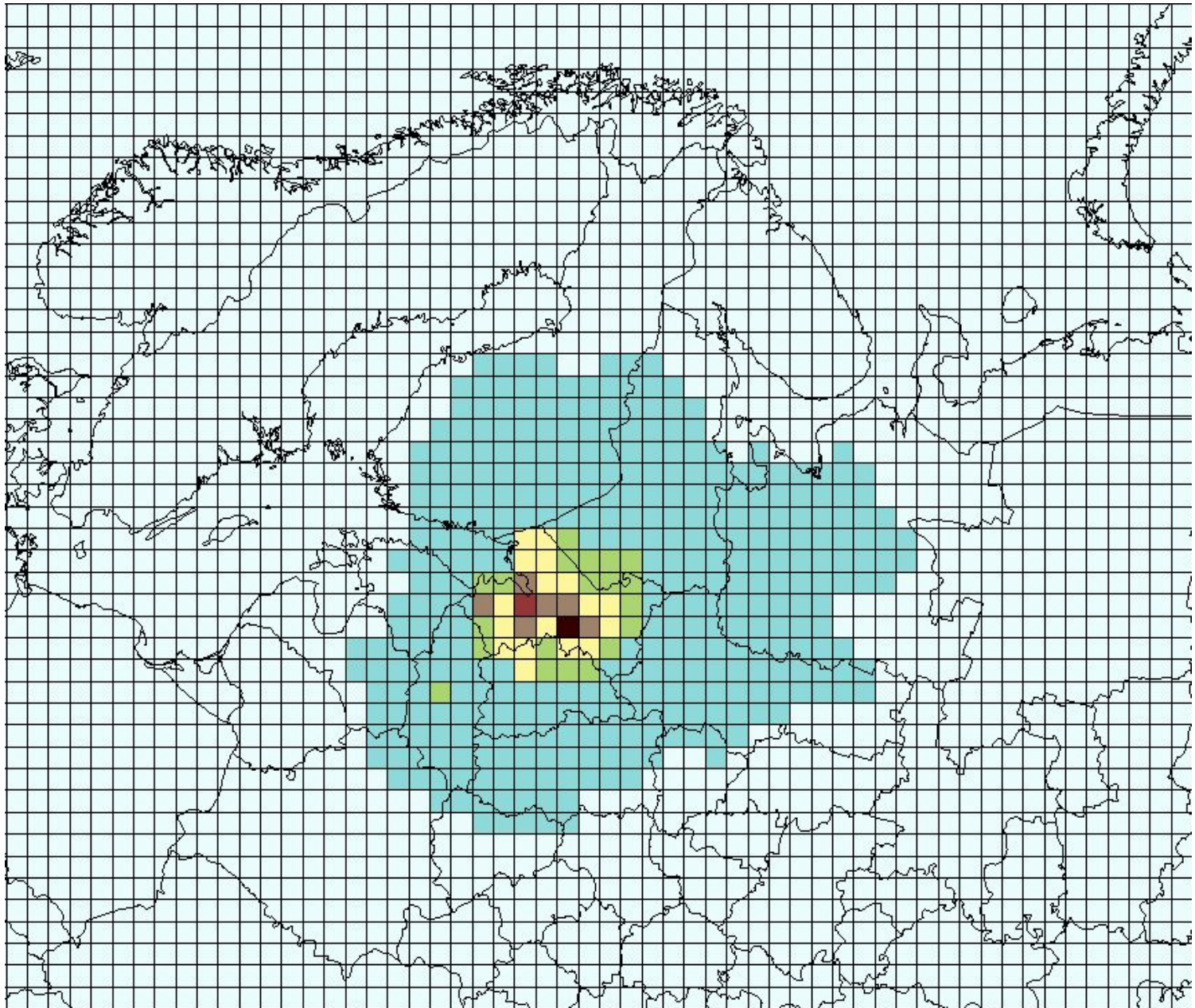


NOx depositions from the SPET region after a switch to Euro 3, mgN/m²

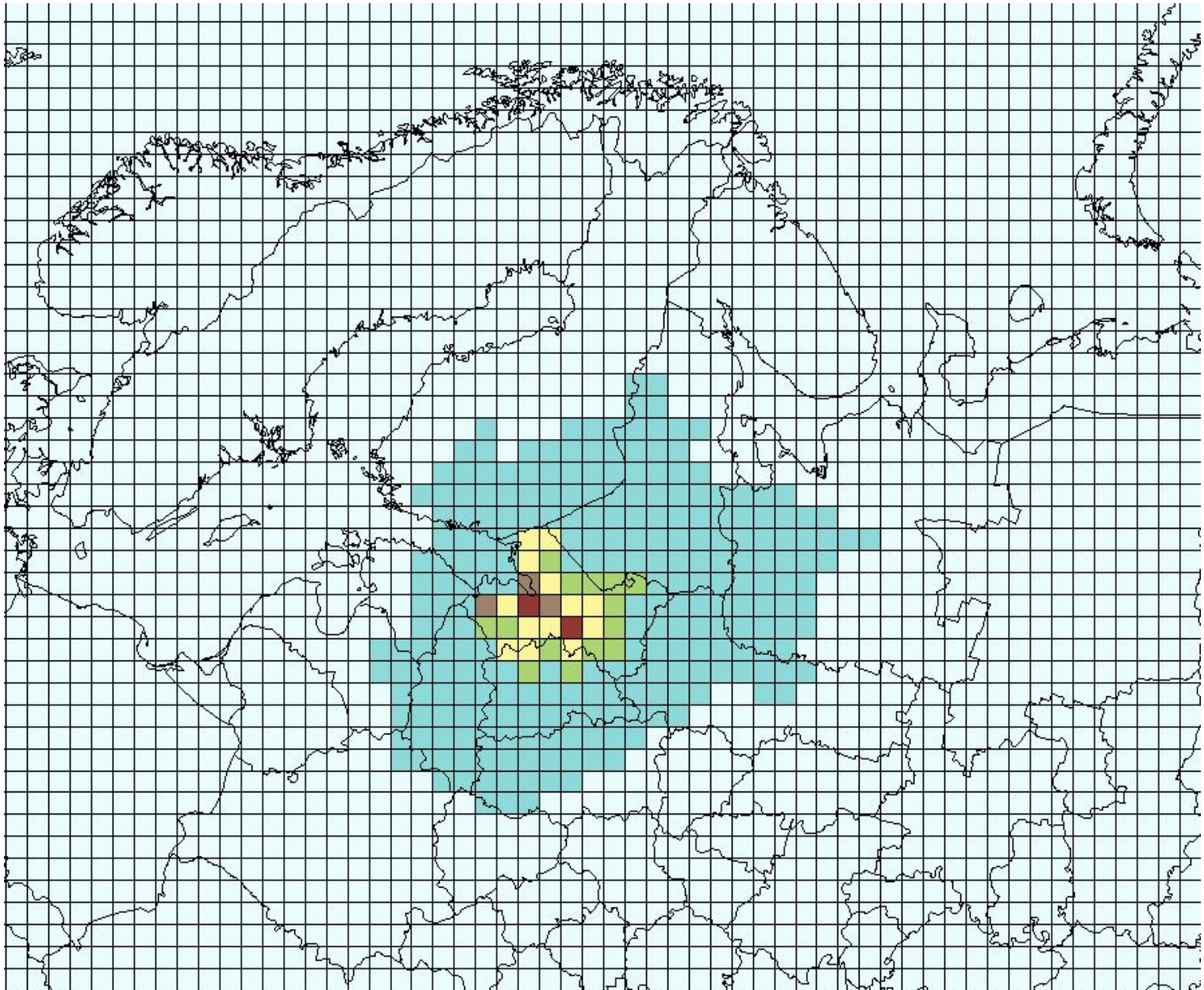


Review of SOx depositions from the SPET region with/without control strategies implementation

SOx depositions from the SPET region without CS implementation, mgS/m^2

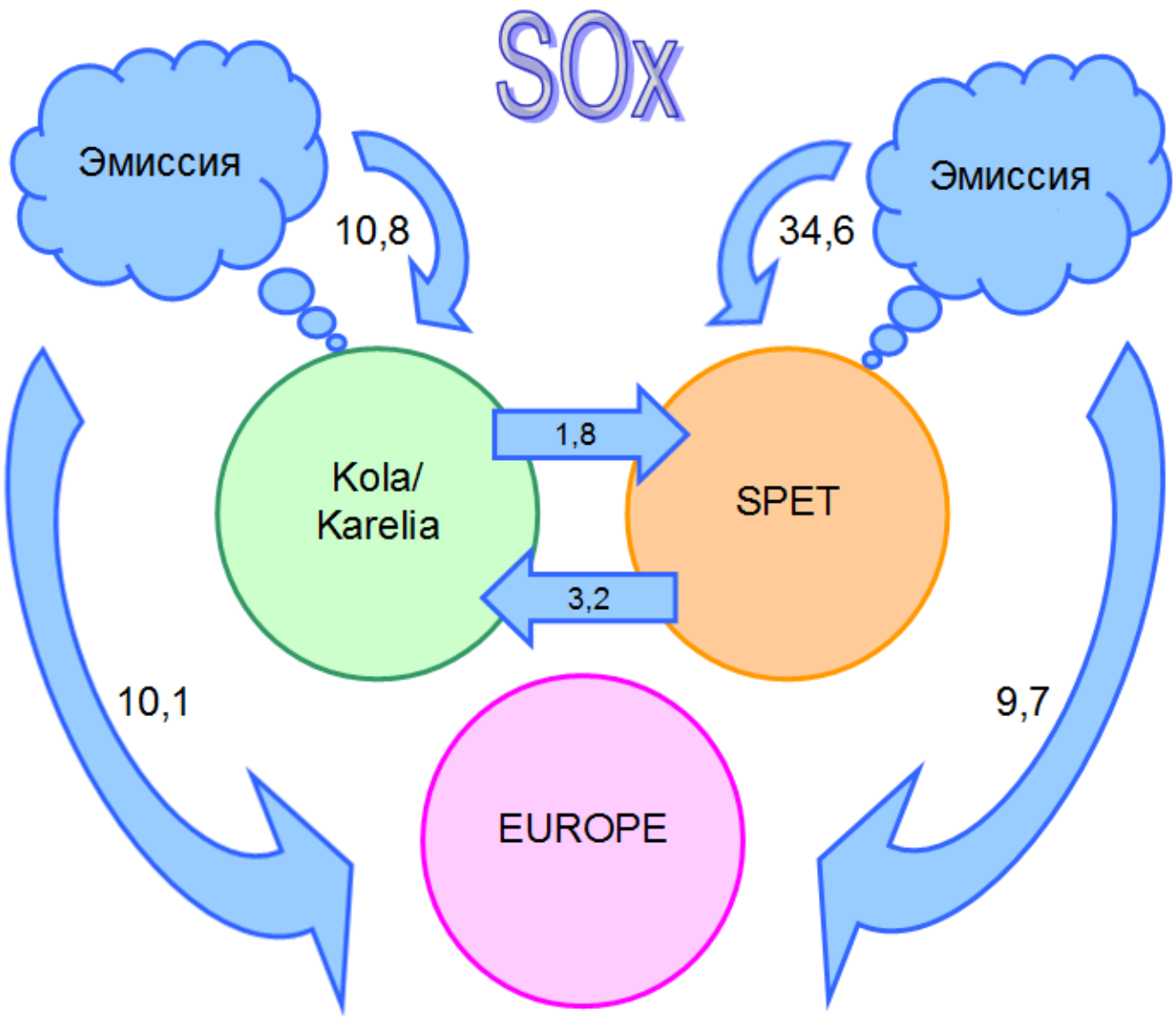


SOx depositions from the SPET region after IIASA CS implementation, mgS/m^2

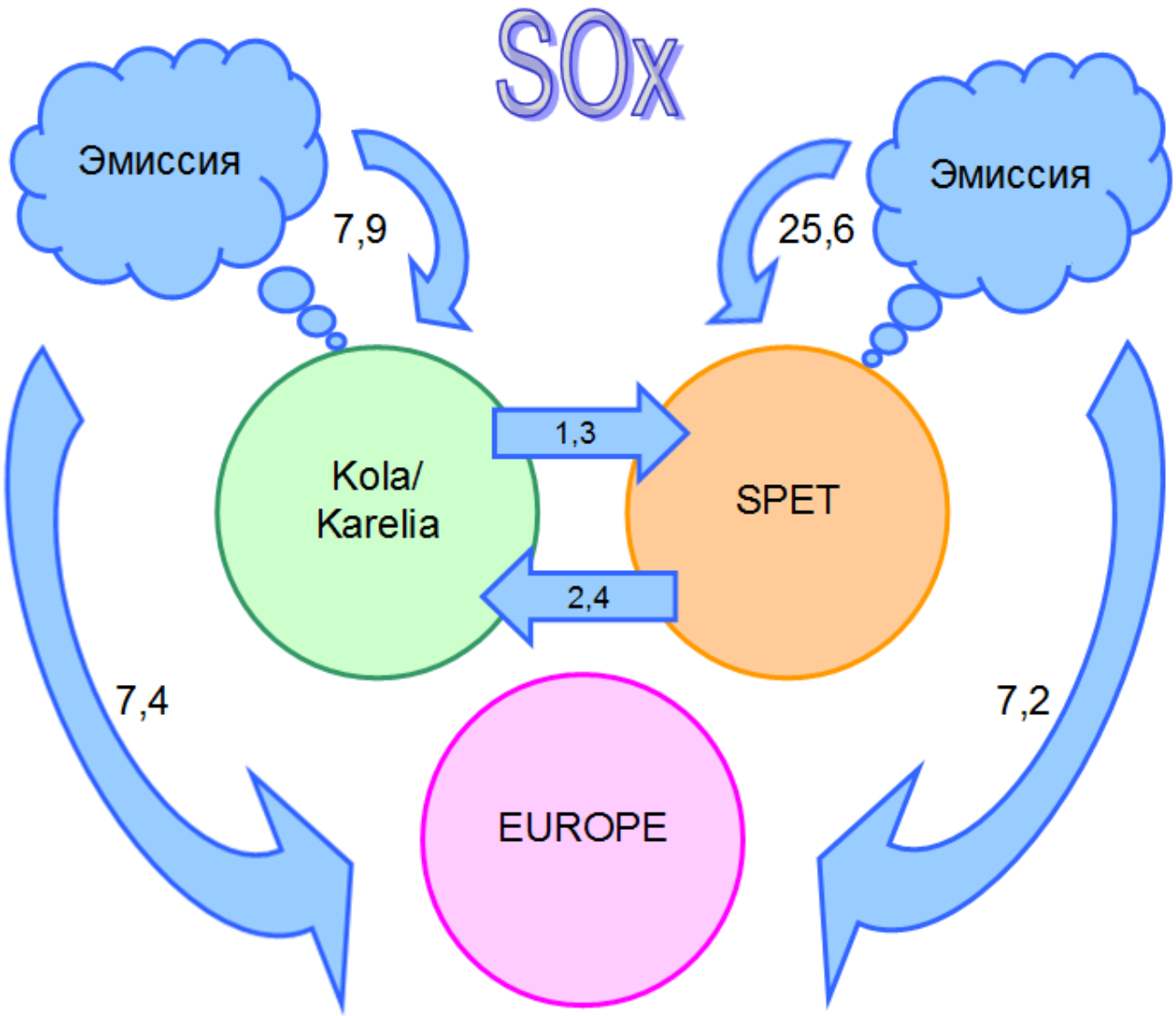


Review of NOx and SOx fluxes from SPET and Kola/Karelia regions , between each other and Europe, with/without control strategies implementation

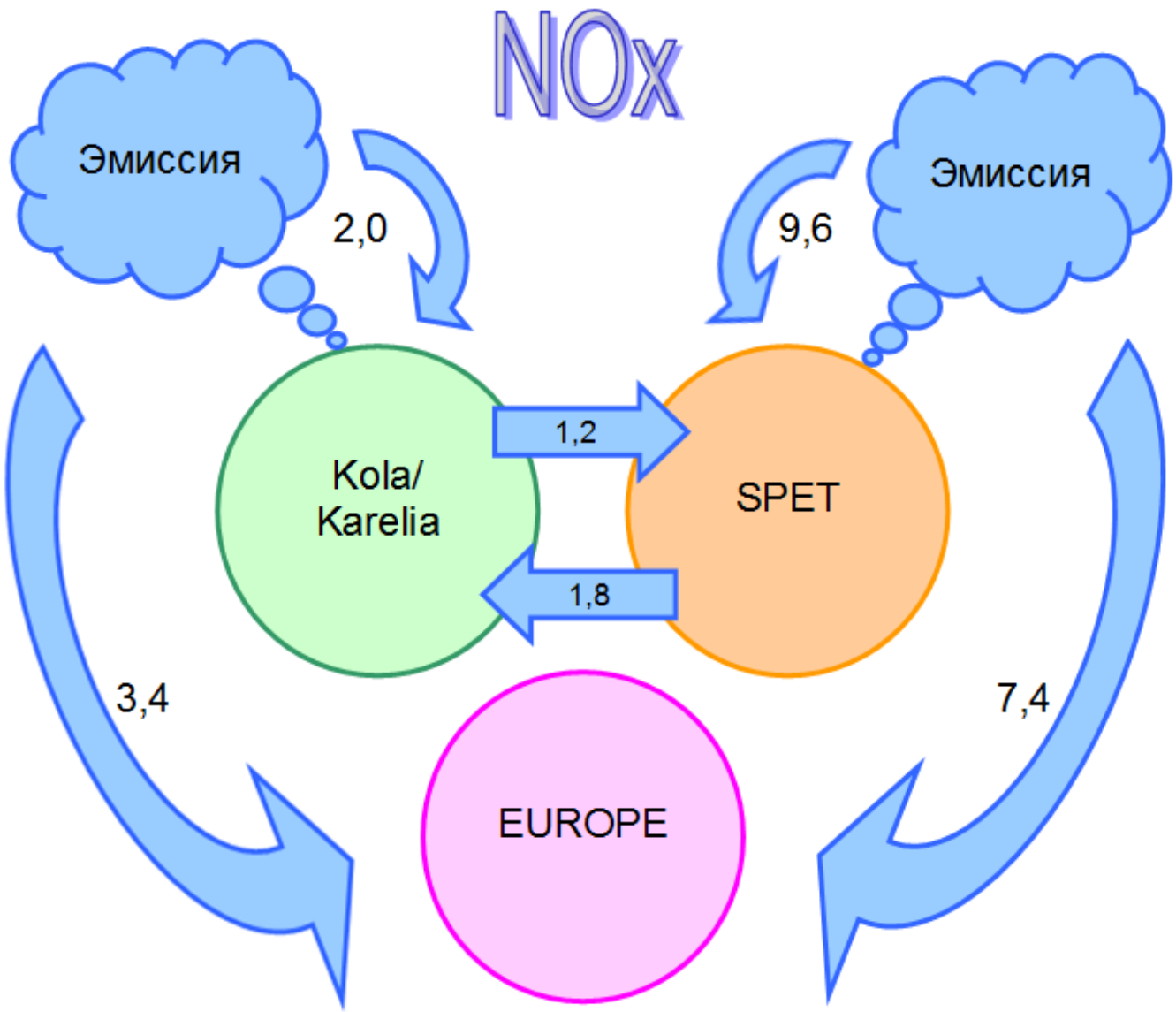
Without control strategies implementation, th. tonnes S



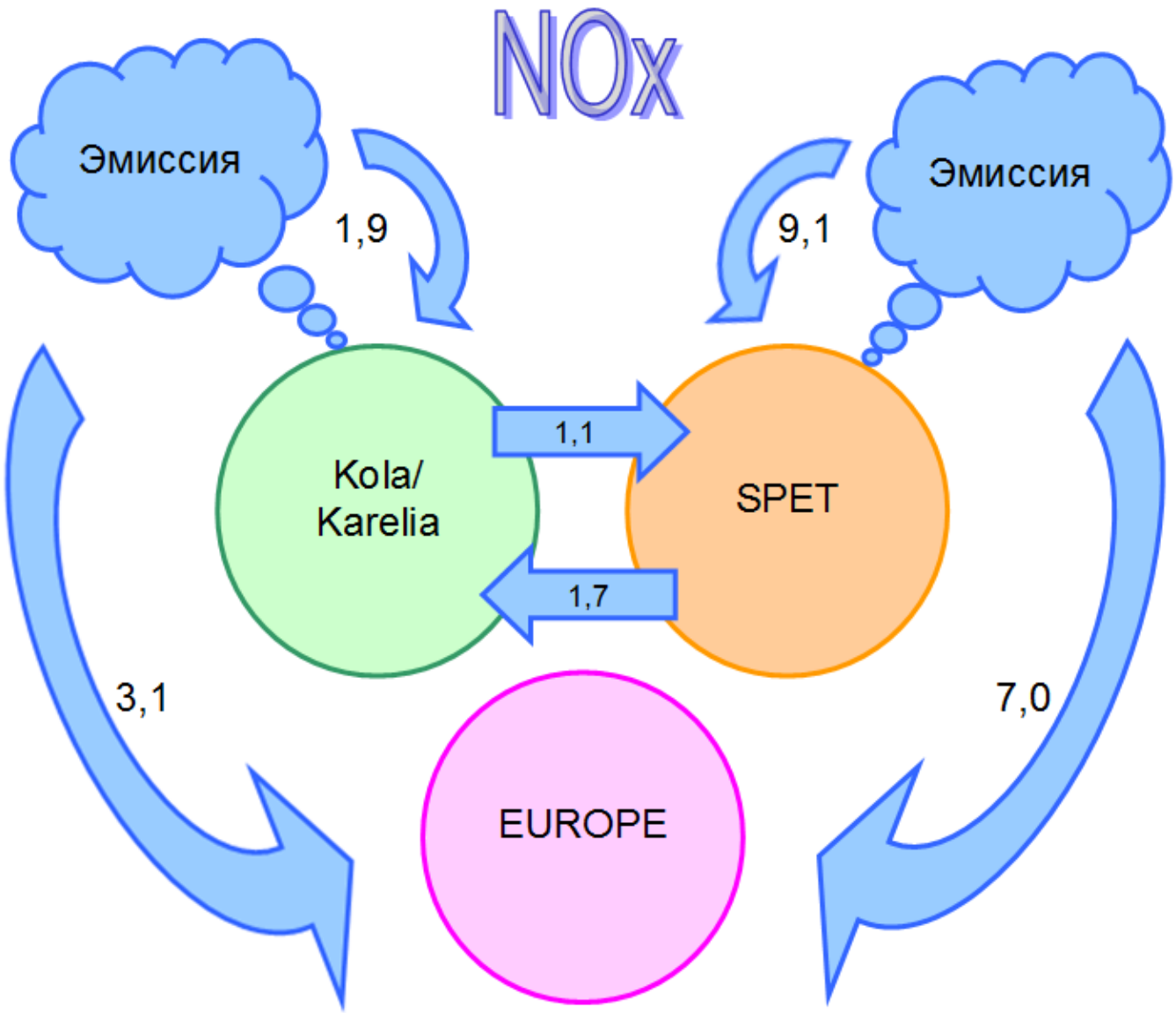
With IIASA control strategy implementation, th. tonnes S



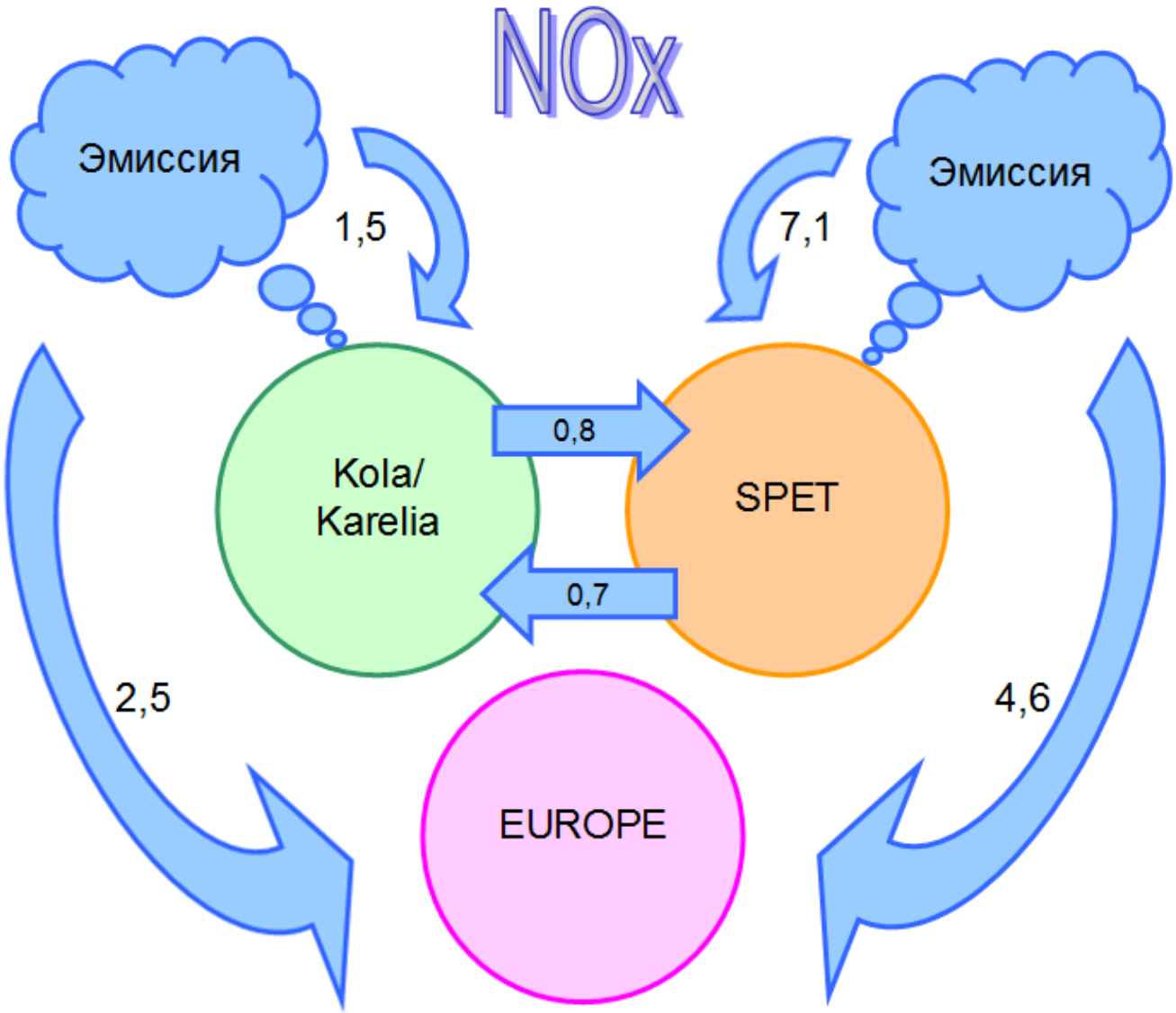
Without control strategies implementation, th. tonnes N



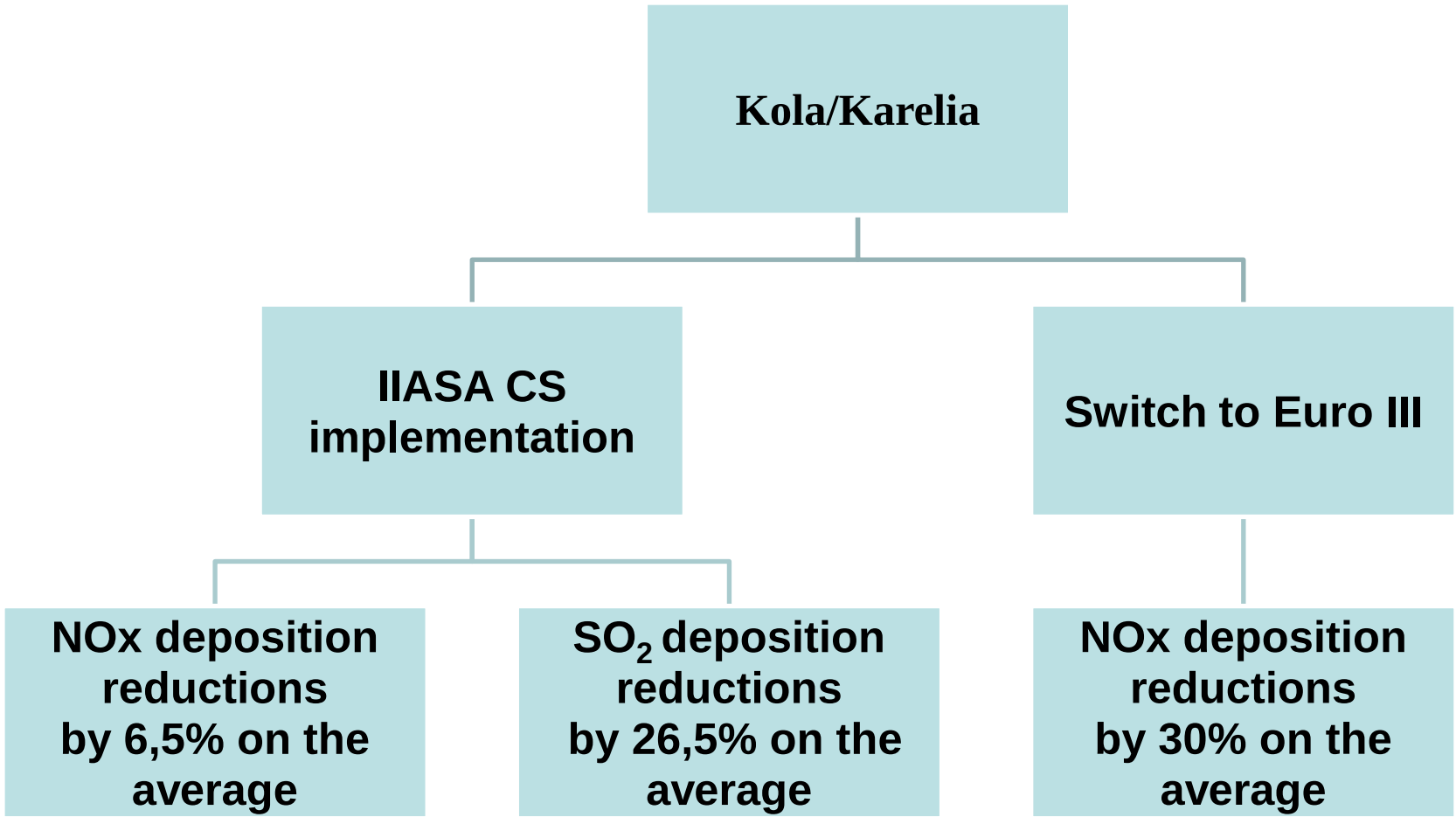
With IIASA control strategy implementation, *th. tonnes N*



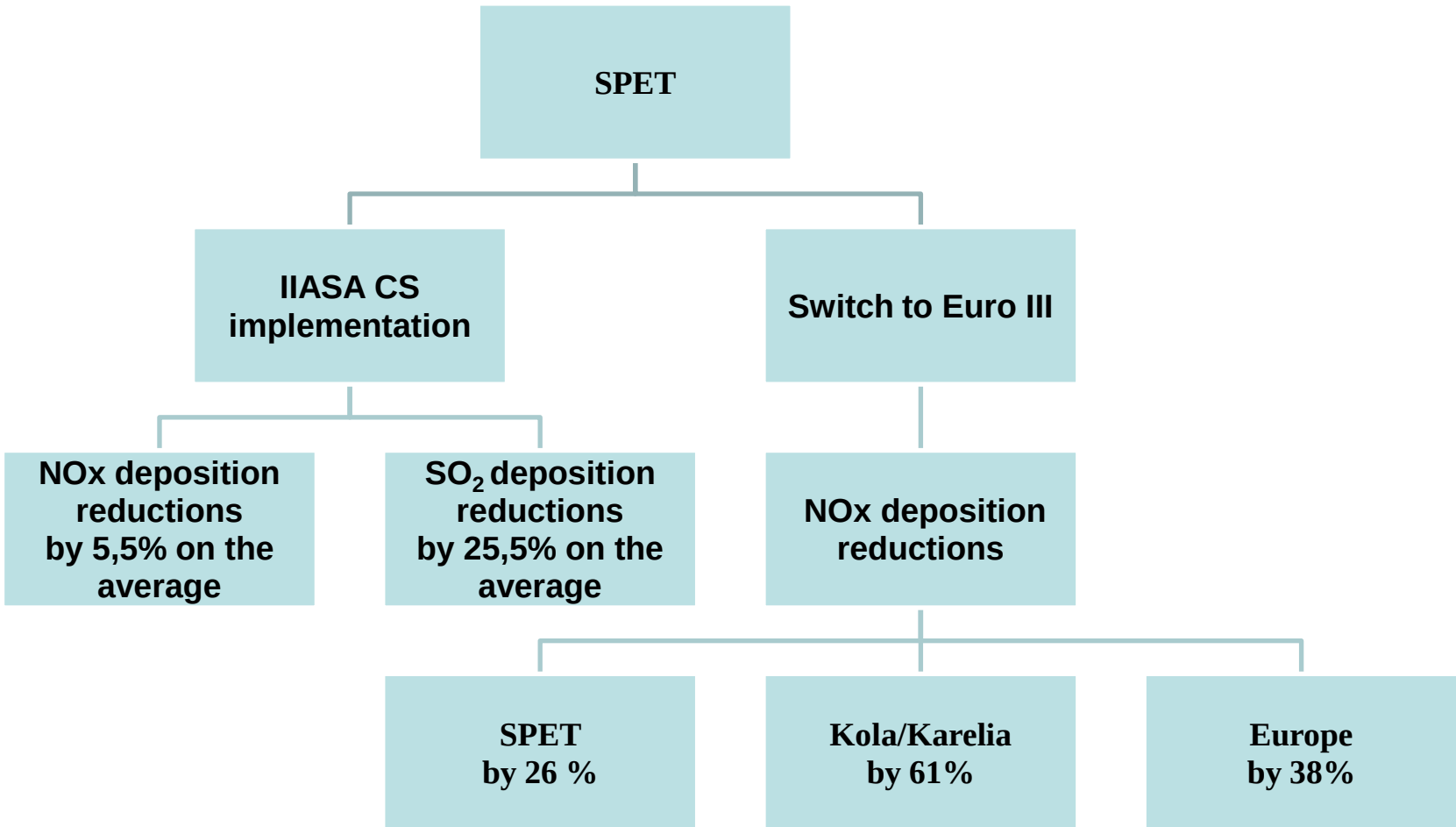
Switch to Euro 3, *th. tonnes N*



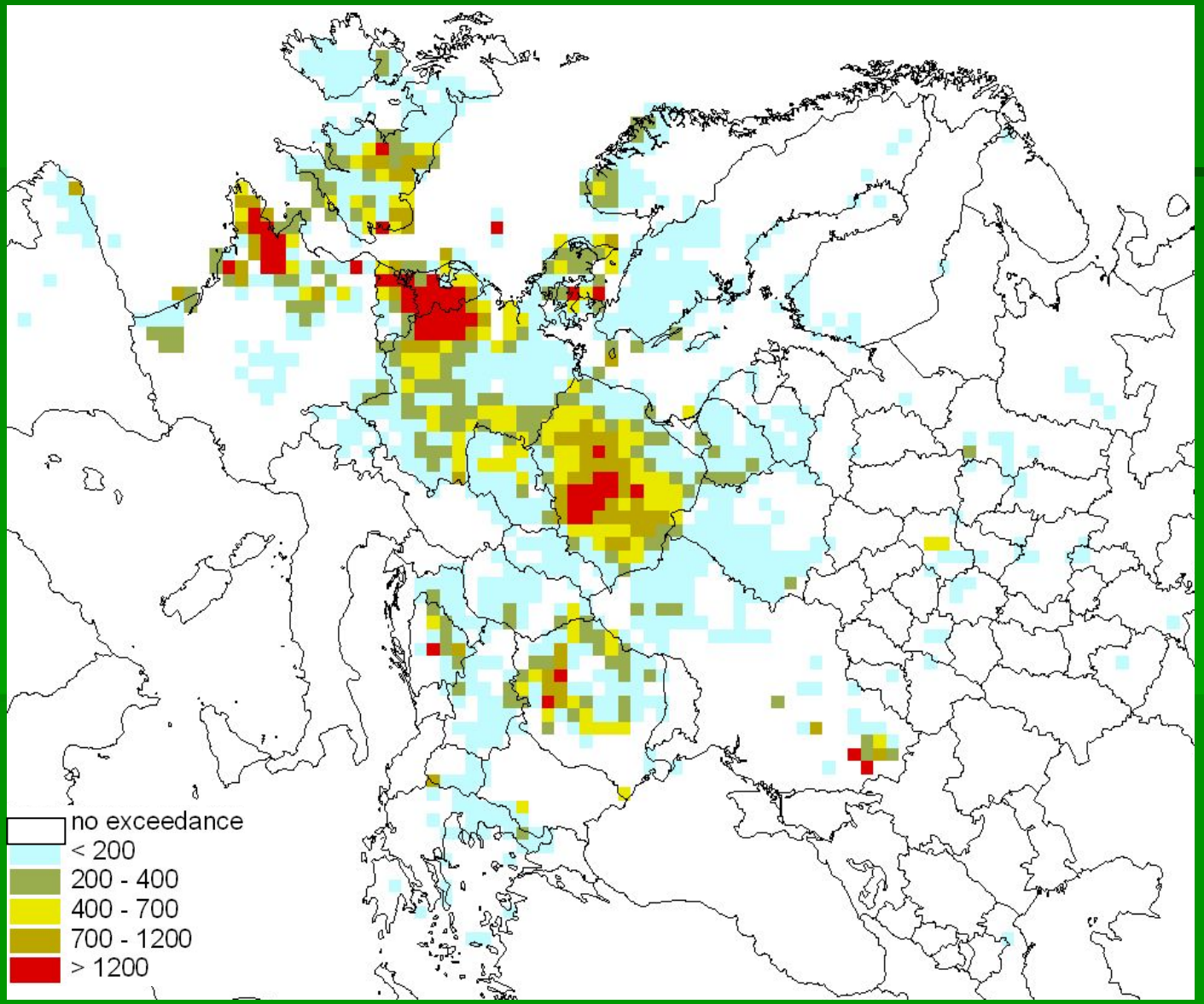
Review of deposition reductions in the considered regions as a result of the control strategies implementation in the Kola/Karelia region



Review of deposition reductions as a result of the control strategies implementation in the SPET region

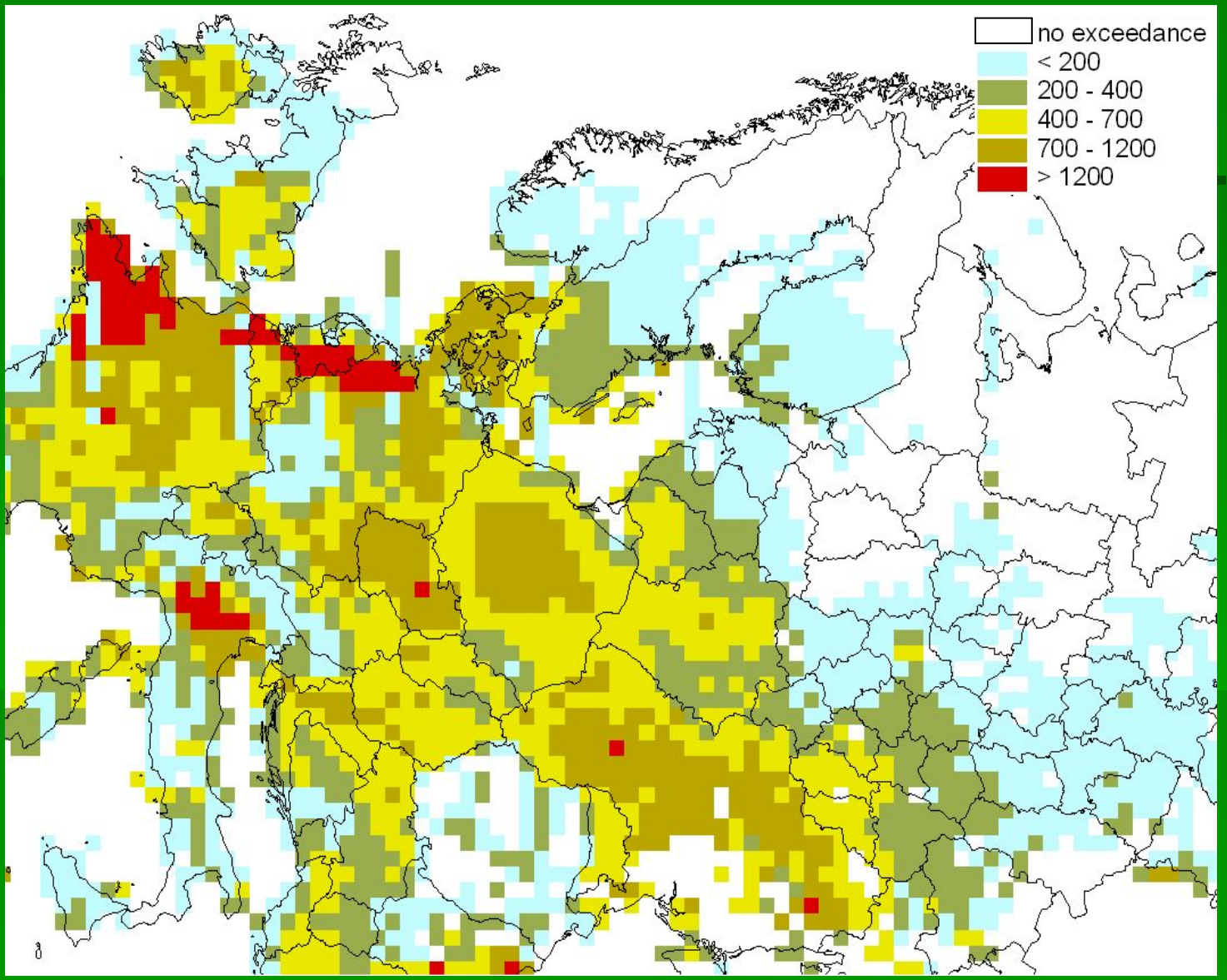


Exceedances of Acidity Critical Loads, *equivalent/ha/year*



Calculation of exceedances of Critical Loads for acidification and eutrophication was performed by Max Posch (CCE, Netherlands) with assistance of Hilde Fagerli (met.no, Norway).

Exceedances of Nutrient Nitrogen Critical Loads, *equivalent/ha/year*



Calculation of exceedances of Critical Loads for acidification and eutrophication was performed by Max Posch (CCE, Netherlands) with assistance of Hilde Fagerli (met.no, Norway).

THANK You
All
for Your attention
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