FAIRMODE Technical Meeting
Working Group 2 - Emissions
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Fairmode Pilot Study Case: Greece and Athens

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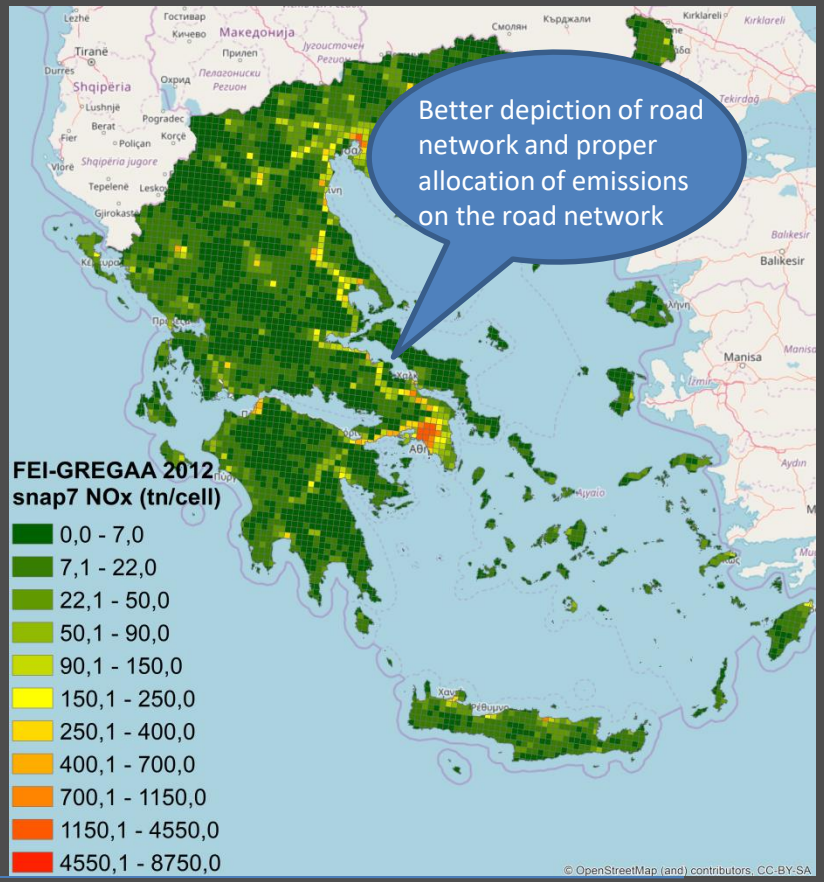
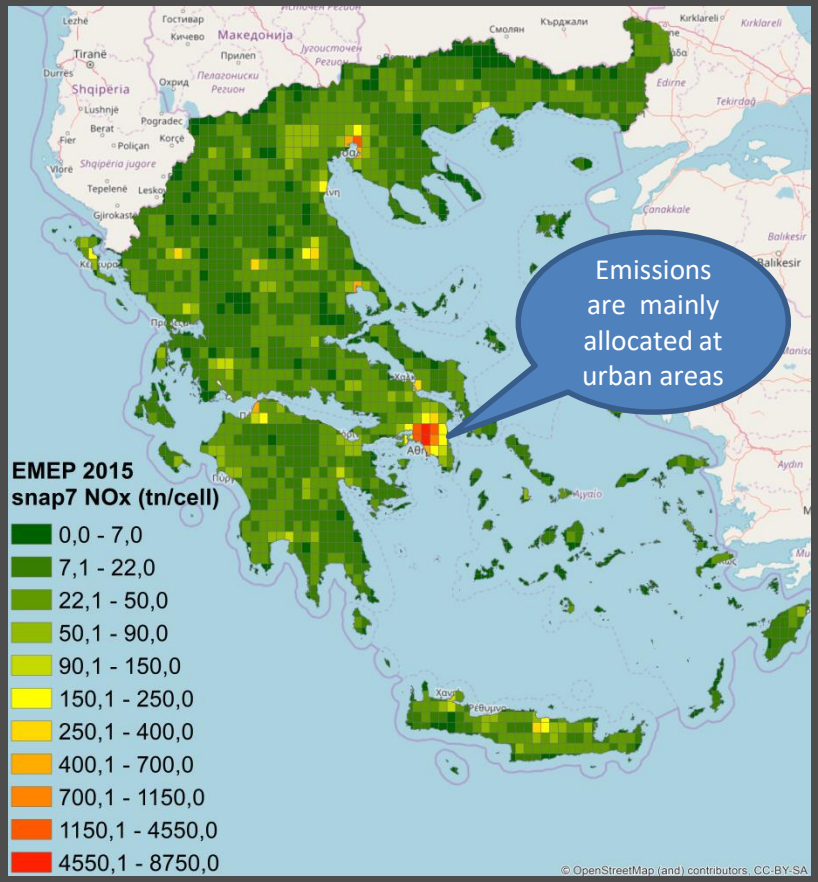
The new EMEP grid VS FEI-GREGAA: ***Greece***

SNAP7- NOx

2012 FEI-GREGAA Grid in 6x6 km^2



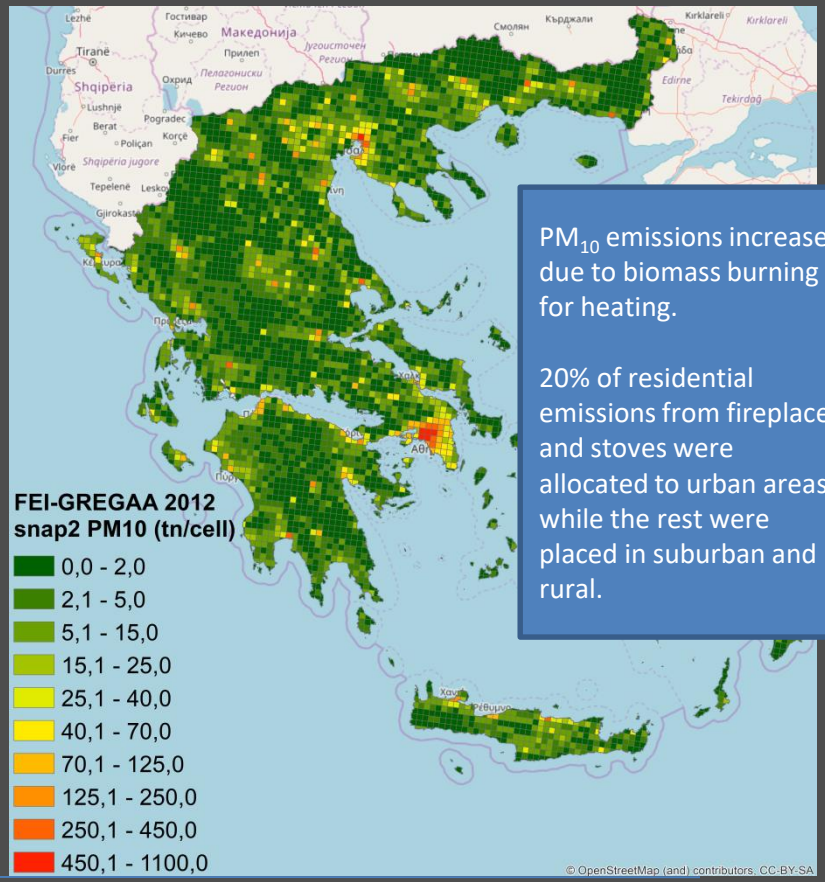
2015 EMEP Grid in 0.1°x0.1°



The new EMEP grid VS FEI-GREGAA: ***Greece***

SNAP2- PM_{10}

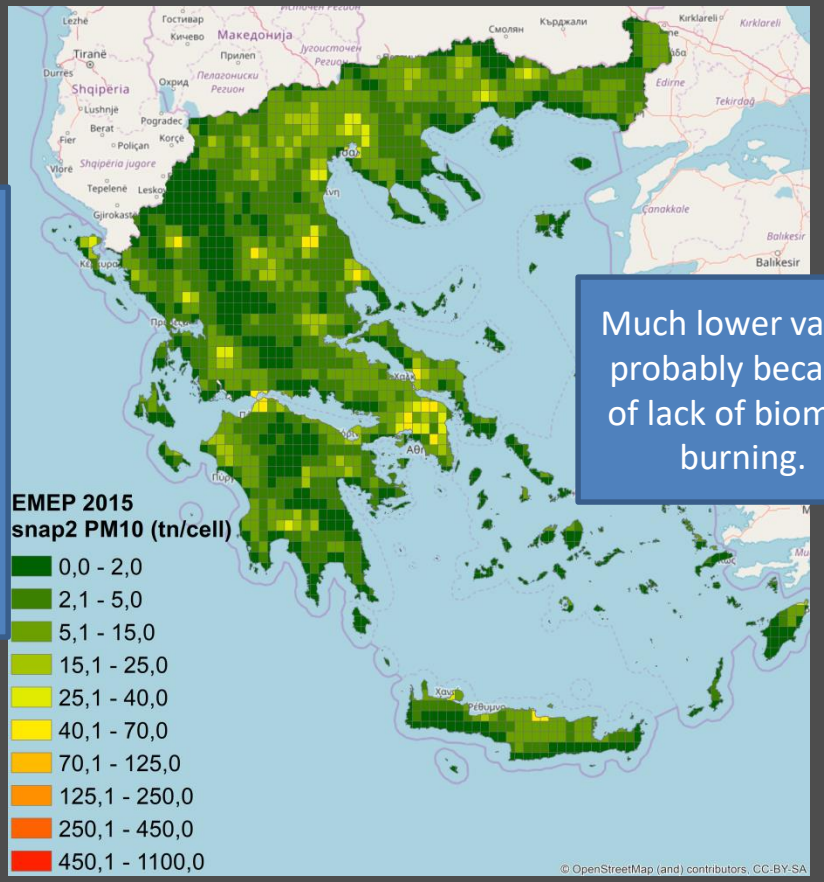
2012 FEI-GREGAA (6x6 km^2)



PM_{10} emissions increased due to biomass burning for heating.

20% of residential emissions from fireplaces and stoves were allocated to urban areas while the rest were placed in suburban and rural.

2015 EMEP 0.1°x0.1°



Much lower values probably because of lack of biomass burning.

The new EMEP grid VS FEI-GREGAA: ***Greece***

Annual values

SNAP2

E.I./ Pollutant	FEI-GREGAA 2012 (ktonnes)	EMEP 2015 (ktonnes)
NOx	11.771	8.706 (12.985 in 2012)
PM_{10}	37.645	10.967(13.40 in 2012)

SNAP7

E.I./ Pollutant	FEI-GREGAA 2012 (ktonnes)	EMEP 2015 (ktonnes)
NOx	92.049	68.485 (68.085 in 2012)
PM_{10}	4.442	4.564 (4.516 in 2012)

Our PM_{10} value is almost 3 times higher as opposed to EMEP.

Possible reason : Biomass burning not taken into account at EMEP. No change in PM_{10} annual values.

Year	EMEP	FEI-GREGAA
2006	13.25	27.84
2007	12.71	32.65
2008	12.17	28.55
2009	11.63	26.39
2010	11.09	26.28
2011	10.68	31.52
2012	13.40	37.64
2013	11.09	
2014	9.56	
2015	10.97	

Consistency issue: COPERT methodology was used for EMEP and FEI-GREGAA

- ***PM_{10} values similar BUT NOx values very different***

Reasons for the main differences

The reasons behind the differences between FEI-GREGAA and EMEP can be summarized as follows:

SNAP 7: For the annual values → 1. Different vehicles fleet composition used for COPERT application
(including speciation per fuel type and engine technology)
2. Different annual mileage (km travelled per vehicle)

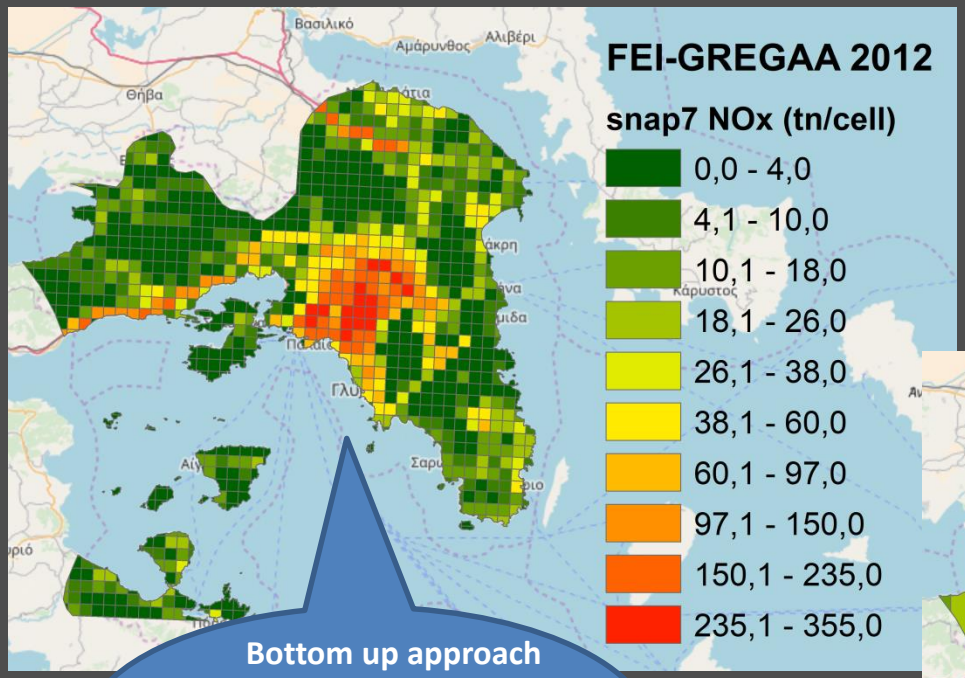
For the spatial allocation → Different proxy values
EMEP disregarded the road network and allocated emissions according to population (?) only
FEI-GREGAA: *road network, driving condition, road type and traffic flow* data were used

SNAP 2: The increase in PM_{10} emissions that was observed the last two years in the FEI-GREGAA is not depicted in the EMEP Database emissions. *This is probably due to the failure to include the increase in wood consumption as fuel type in EMEP.*

The new EMEP grid VS FEI-GREGAA: ***Athens***

SNAP7- NOx

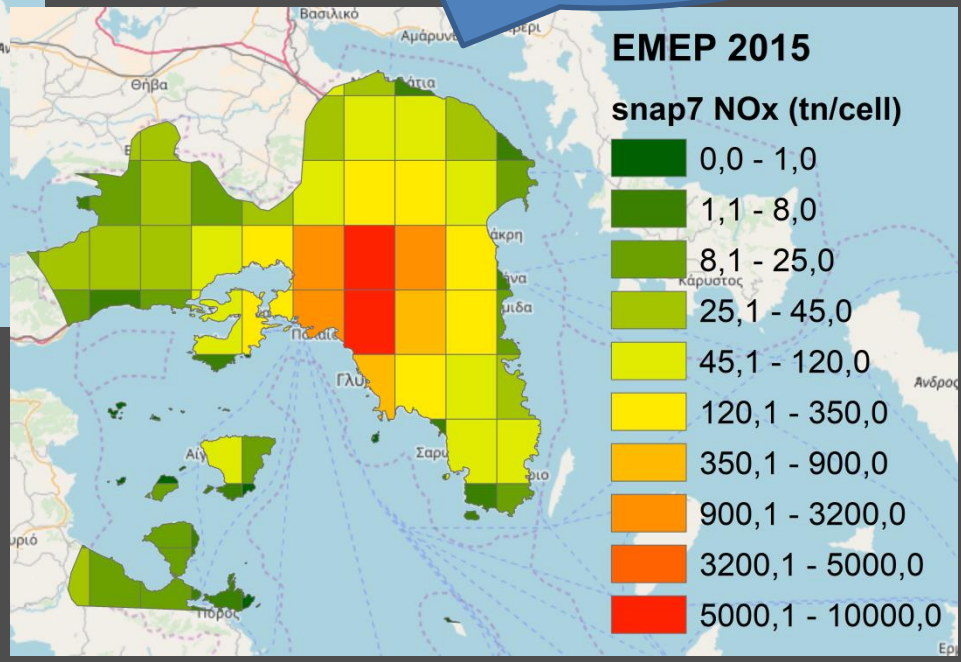
FEI-GREGAA 2x2 km^2



Bottom up approach
Proper allocation of emissions on the road network
Emission'sper km^2: 87.91 tn (max value)

Emissions are allocated based on population data

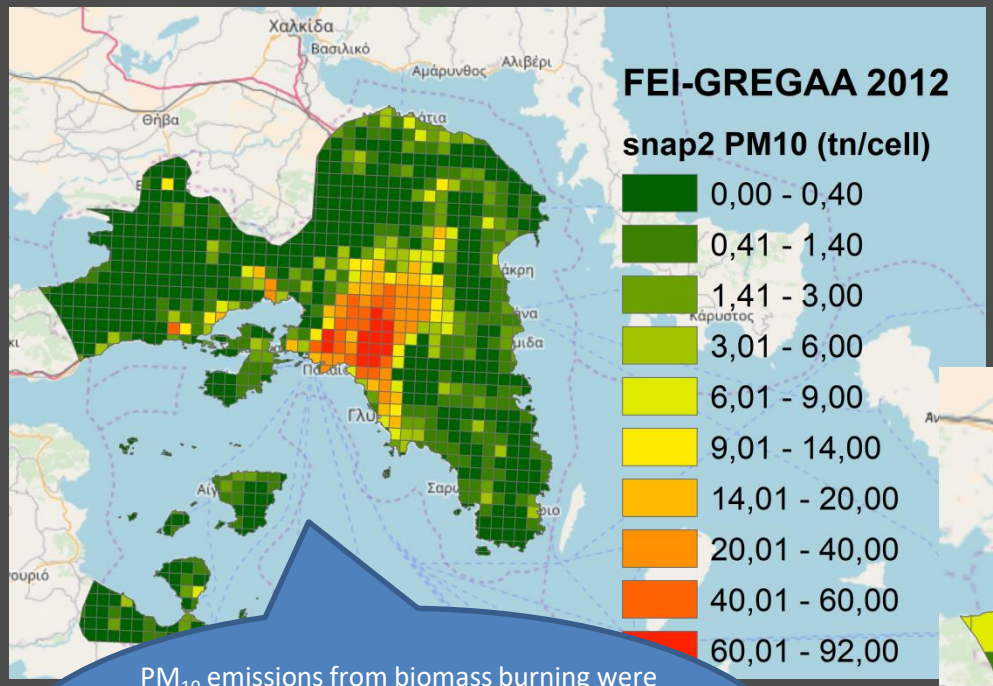
Emissions per km^2: 70.78 tn (max value)



The new EMEP grid VS FEI-GREGAA: ***Athens***

SNAP2- PM_{10}

FEI-GREGAA 2x2 km^2

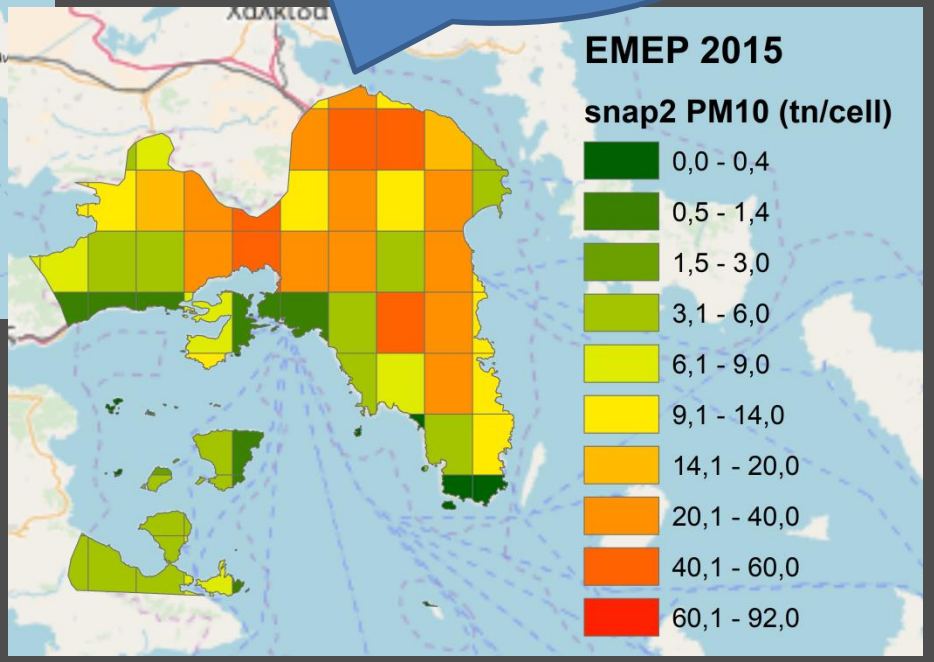


PM_{10} emissions from biomass burning were attributed at urban and rural areas based on urbanization, population and land use.

Annual emissions per km^2:
19.16 tn (urban area)
2.05 tn (rural area)

It seems that no specific proxy value was used for the spatial allocation

Emissions per km^2:
0.03 tn (urban area)
0.38 tn(rural area)



The new EMEP grid VS FEI-GREGAA: ***Athens***

Annual values

SNAP2

E.I./ Pollutant	FEI-GREGAA 2012 (ktonnes)	EMEP 2015 (ktonnes)
NOx	3.01	2.77
PM_{10}	4.71	0.83

SNAP7

E.I./ Pollutant	FEI-GREGAA (ktonnes)	EMEP (ktonnes)
NOx	24.43	24.83
PM_{10}	1.30	2.10

- While EMEP refers to more recent period for both SNAPS, NOx emissions appear similar to FEI-GREGAA.

Possible reason: no update of data?

- SNAP2: PM_{10} values from EMEP appear four times smaller.

Possible reason: the lack of biomass burning.

The new EMEP grid VS FEI-GREGAA

Are there any lessons learnt from the comparison with EMEP?

1. Spatial allocation coefficients are very important.

2. Regular updates of initial data are necessary in order to import new sources, new fuels, new technologies.

3. **Bottom up emission inventories depict more accurately the actual situation. The expansion of the urban conurbation in Athens has brought changes to the kilometers vehicles travel and to the driving modes which definitely have an impact on the amount and spread of emissions.**

4. Harmonisation of “scientific” works with “regulatory” works is essential!