Italian National Agency for New Technologies,
Energy and Sustainable Economic Development

Potential exceedances of the WHO air quality targets in 2030 in Italy

TFIAM
24-26 May 2023

Antonio Piersanti, Ilaria D'Elia - Lab. Atmospheric Pollution

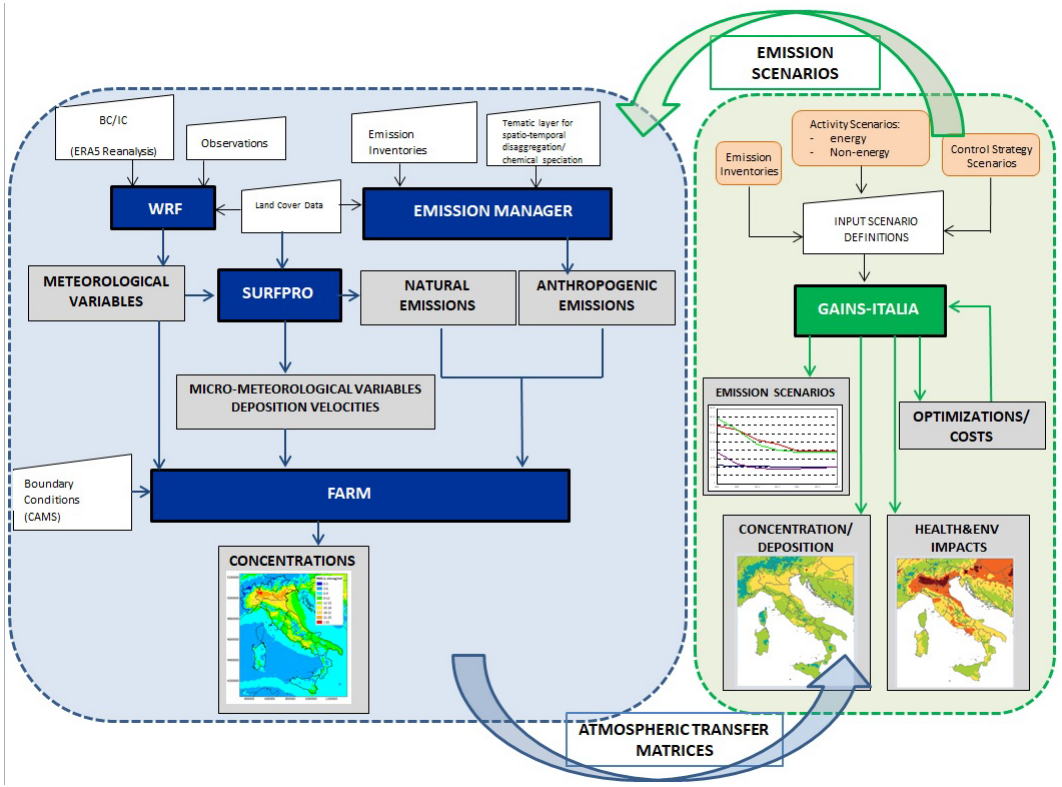
The new WHO targets

Pollutant	Averaging time	Interim target				AQG level
		1	2	3	4	
$PM_{2.5}$, µg/m³	Annual	35	25	15	10	5
	24-hour[a]	75	50	37.5	25	15
PM_{10}, µg/m³	Annual	70	50	30	20	15
	24-hour[a]	150	100	75	50	45
O_3, µg/m³	Peak season[b]	100	70	–	–	60
	8-hour[a]	160	120	–	–	100
NO_2, µg/m³	Annual	40	30	20	–	10
	24-hour[a]	120	50	–	–	25
SO_2, µg/m³	24-hour[a]	125	50	–	–	40
CO, mg/m³	24-hour[a]	7	–	–	–	4

[a] 99th percentile (i.e. 3–4 exceedance days per year).
[b] Average of daily maximum 8-hour mean O_3 concentration in the six consecutive months with the highest six-month running-average O_3 concentration.

◯ = new limits in the revised AAQD proposal

MINNI: the Italian National Integrated Assessment Model



Integrated Approach:
To assess the potential effects of new policies and measures aiming at reducing air pollution and climate change and their relative impacts

Different projects:

- NAPCP for the NEC Directive;
- Project Pulvirus to understand the effect of COVID-19 restrictions on air quality

The first Italian National Air Pollution Control Programme (NAPCP) - 2019

The Italian NAPCP under the NEC Directive: Air Quality, Health Impact and Cost Assessment

TFIAM
21-23 April 2021

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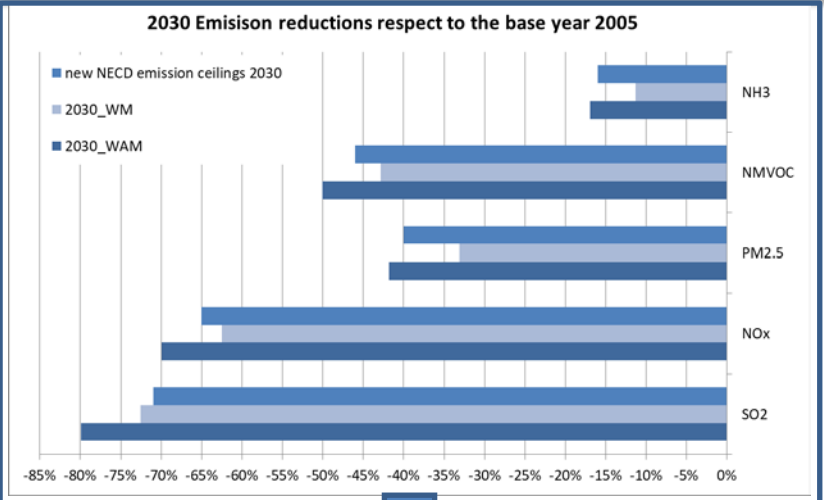
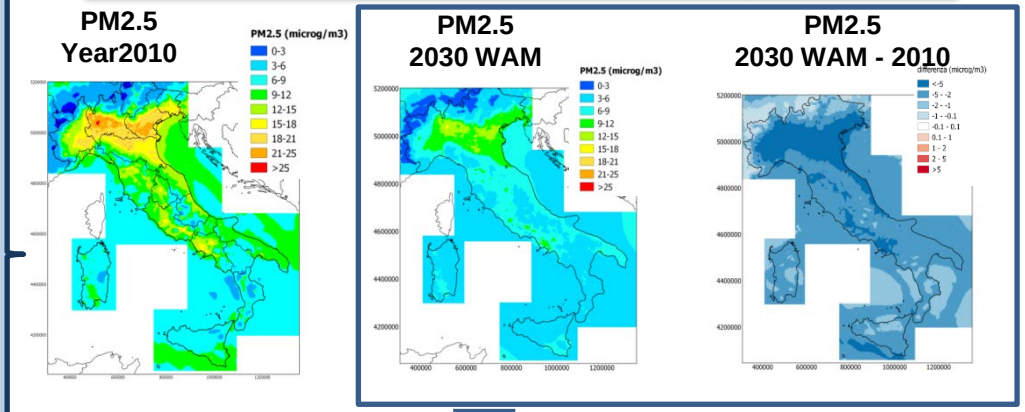


2030 Ceilings: non compliance for WM (With Measures) scenario (all pollutants but SO_2)
→ Additional measures needed (WAM)

WAM Compliance with NEC target… but what happens to air quality?



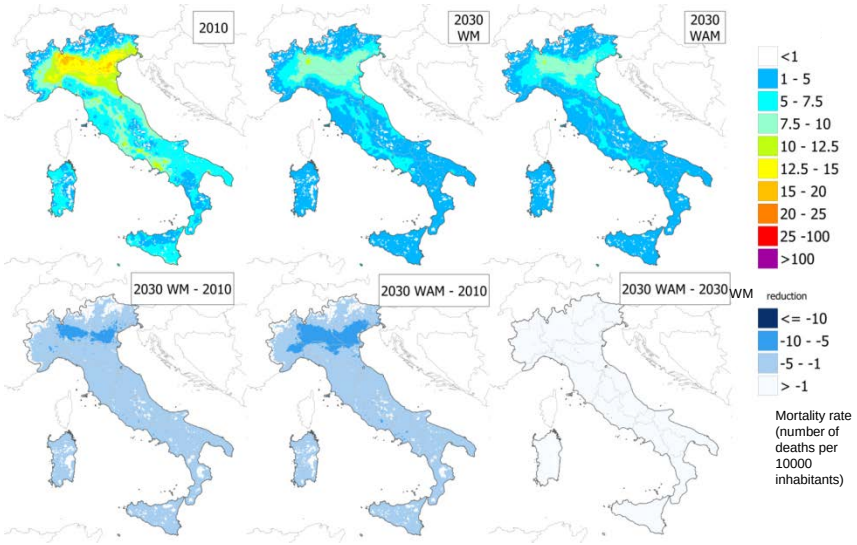
EU limit values (AAQD 2008) attained but WHO limits largely exceeded

And what about health and environment impacts?

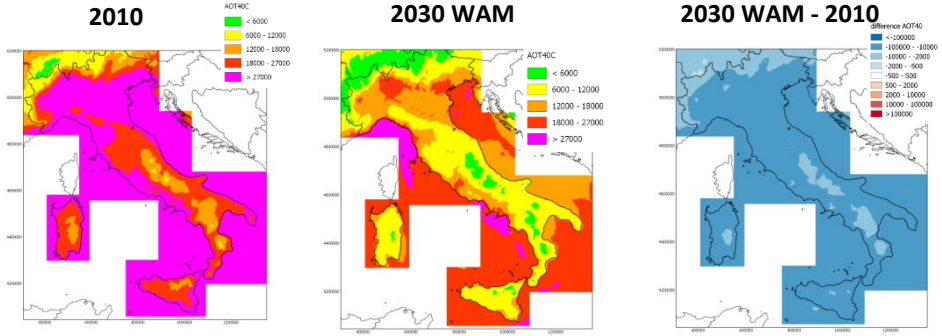
https://previous.iiasa.ac.at/web/home/research/researchPrograms/air/policy/8_Piersanti_TFIAM_2021.pdf

Health & Environmental Impacts

PM2.5 Mortality rate - WM and WAM



Ozone AOT40 vegetation - WAM



May to July
Targe value: 18 000 µg/m³
Directive 2008/50/EC

WM impacts substantially on the number of expected deaths

WAM brings an economical benefit equal to 2.05 % of Italian 2010 GDP, mainly in the Po Valley hot-spot, but not negligible (>1%) in several regions

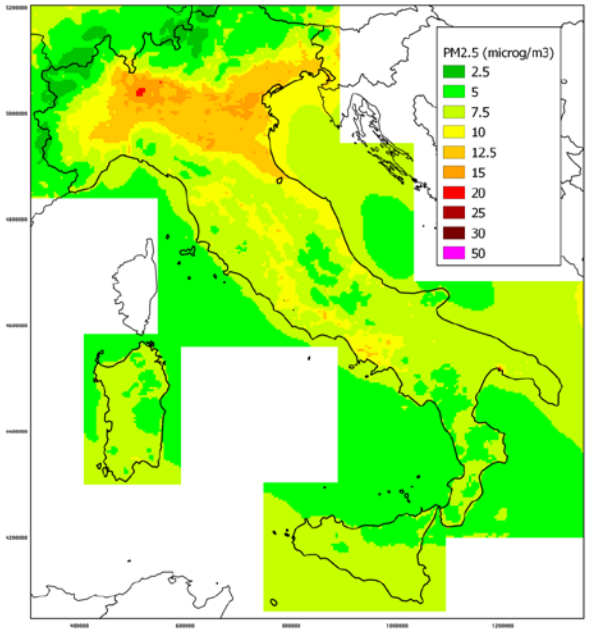
WAM brings few minor benefits and more efforts are needed

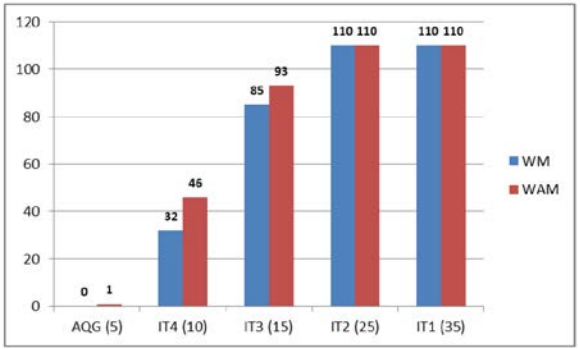
Piersanti et al., 2021. Atmosphere, doi: 10.3390/atmos12020196

https://previous.iiasa.ac.at/web/home/research/researchPrograms/air/policy/8_Piersanti_TFIAM_2021.pdf

What happens with respect to the new (2021) WHO targets?

PM2.5 Concentrations
2030 WAM scenario





Total number of
AQ monitoring stations
in compliance
per Interim Target (IT) -
2030 WM and WAM scenarios

Number of
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per ranges between ITs –
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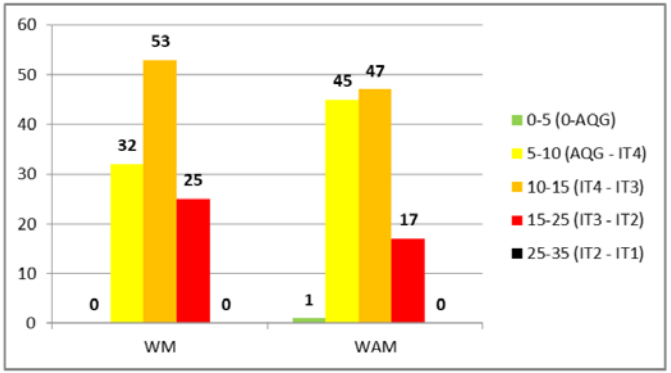

2010-bias corrected concentration values at stations

What happens with respect to the new (2021) WHO targets?

NO_2 concentrations
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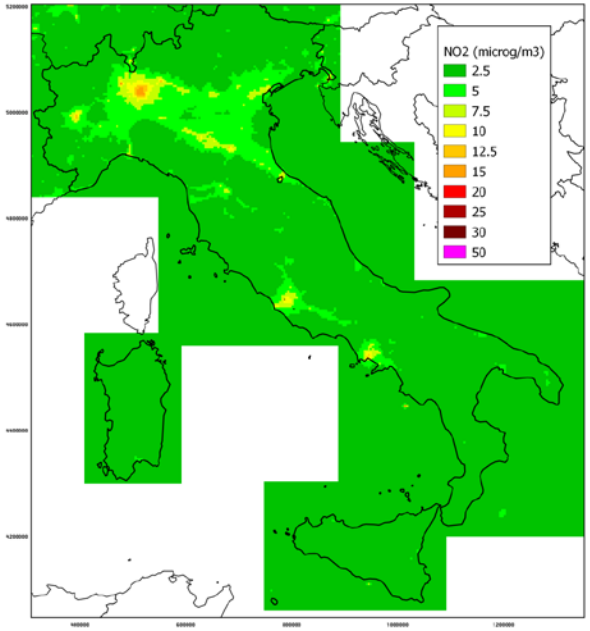

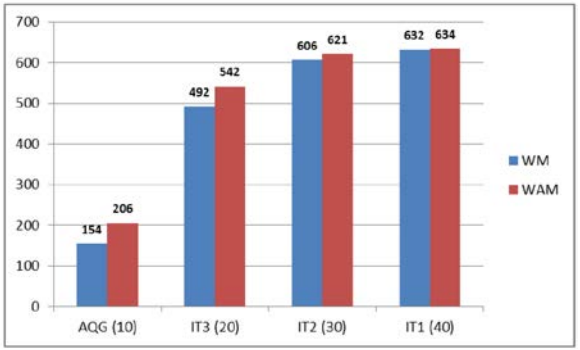

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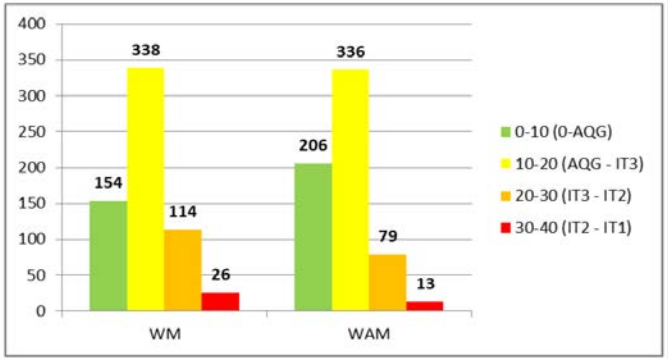
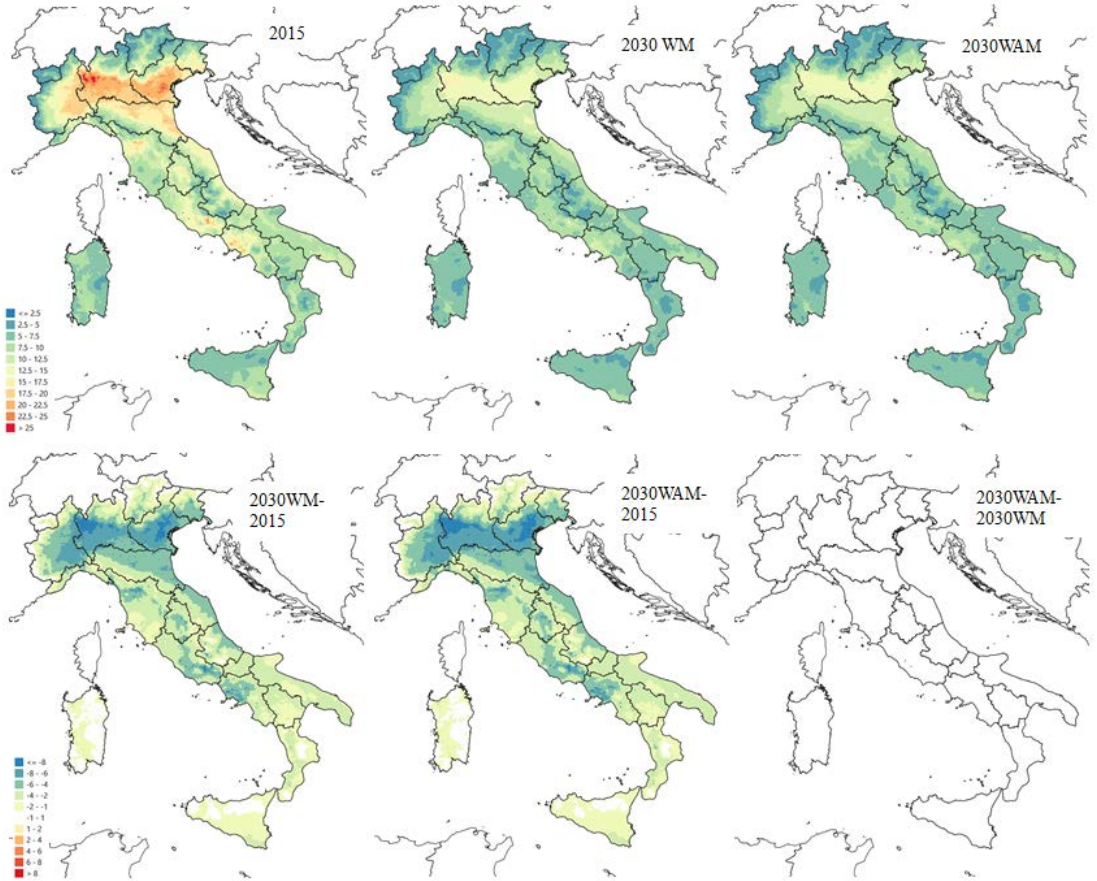


2010-bias corrected concentration values at stations

Coming soon:
new air quality 2030 WM and WAM scenarios

Updated scenarios for the new NAPCP where Energy and Climate policies are integrated

$PM_{2.5}$ concentrations
2030 WM and WAM scenarios
(base year 2015)



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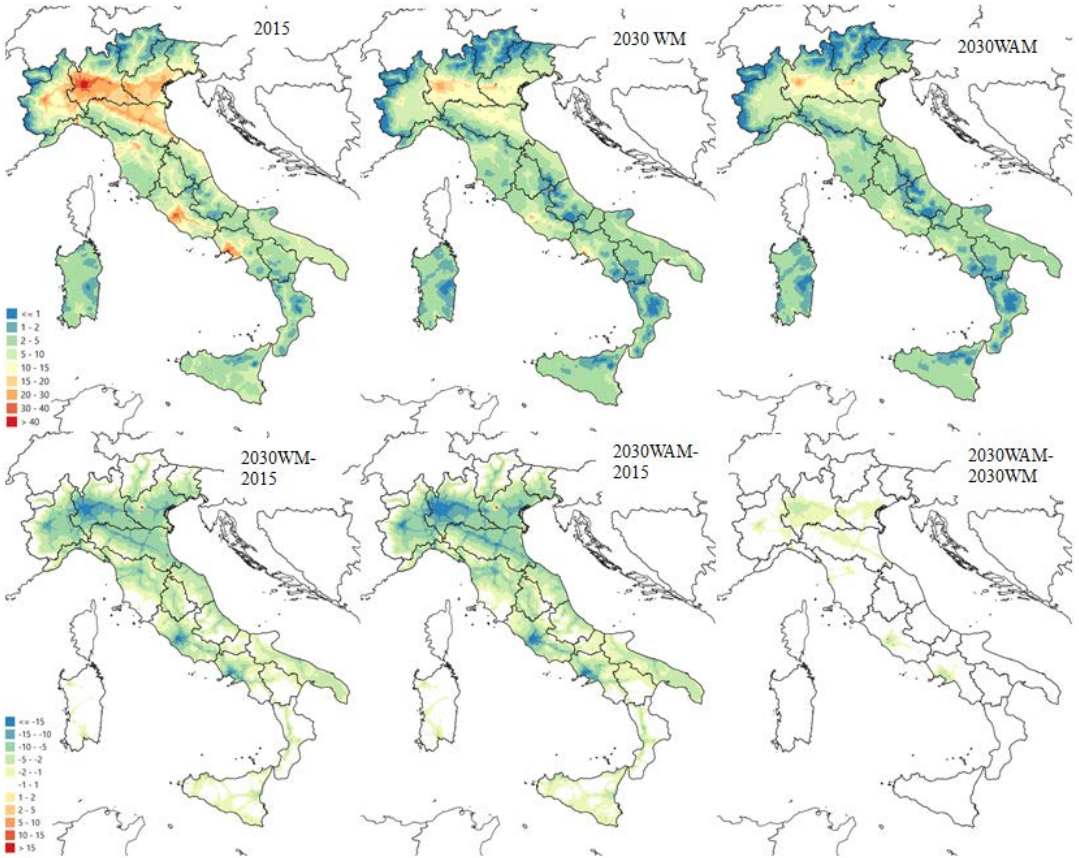

Thank you

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