

Air Quality and Climate Goals, Actions and Progress of Lombardy

2020 Beijing International Forum for Metropolitan
Clean Air and Climate Actions
September 7th, 2020

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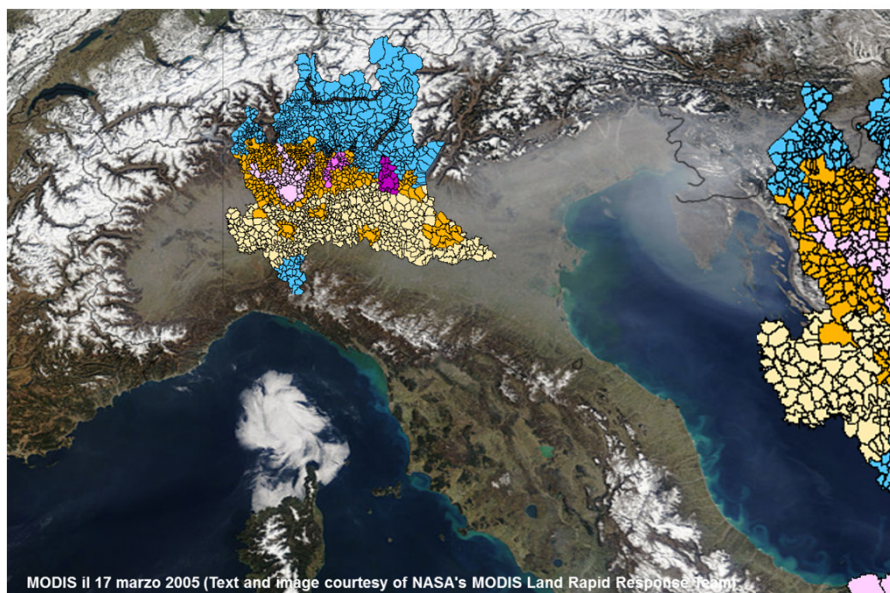
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Milano and Lombardia



Lombardia Region

- Inhabitants: 10 milion
- Population density: 419 inhab/km2

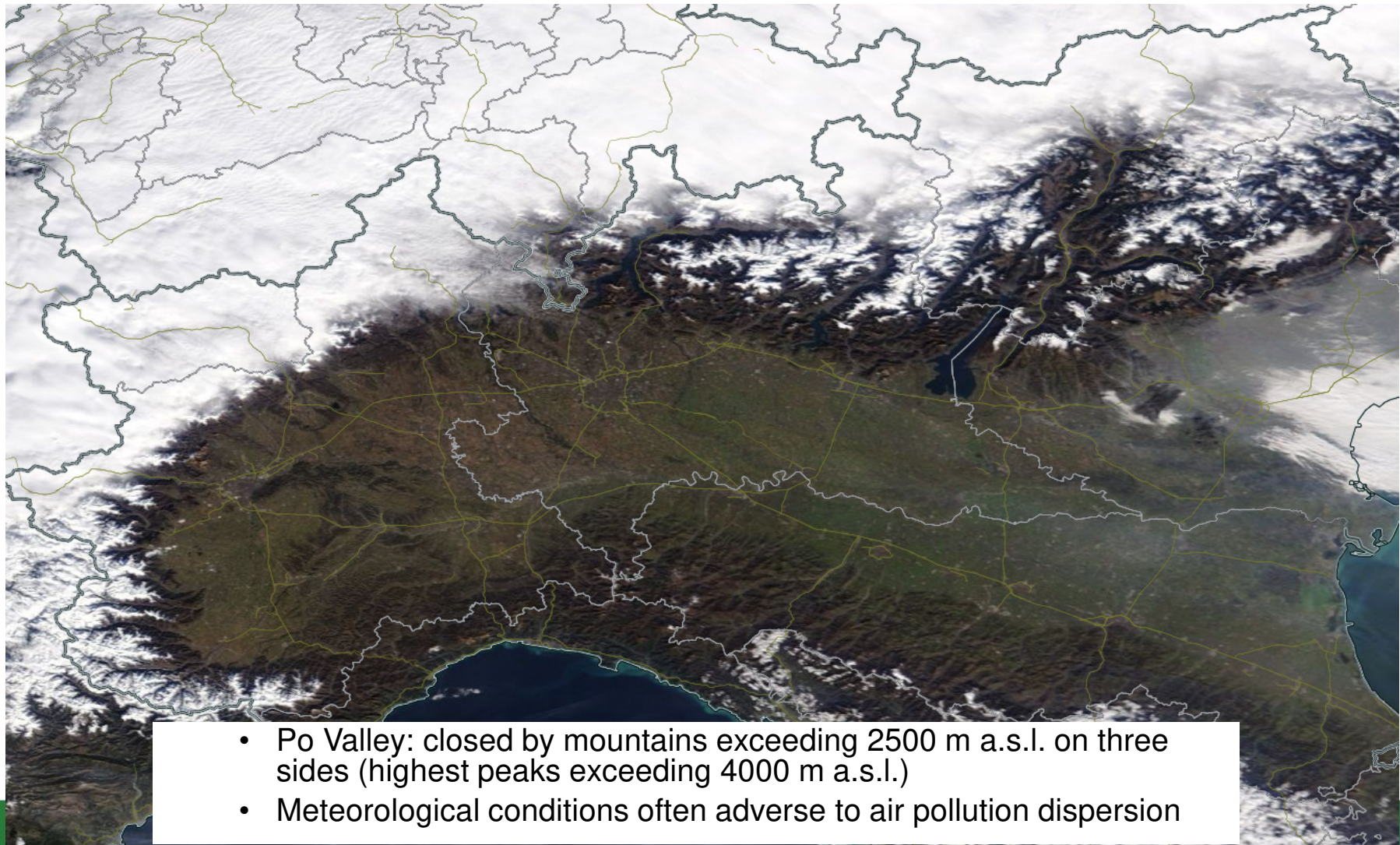
Milan conurbation

- Inhabitants: 3,6 milion
- Population density: 3141 inhab/km2



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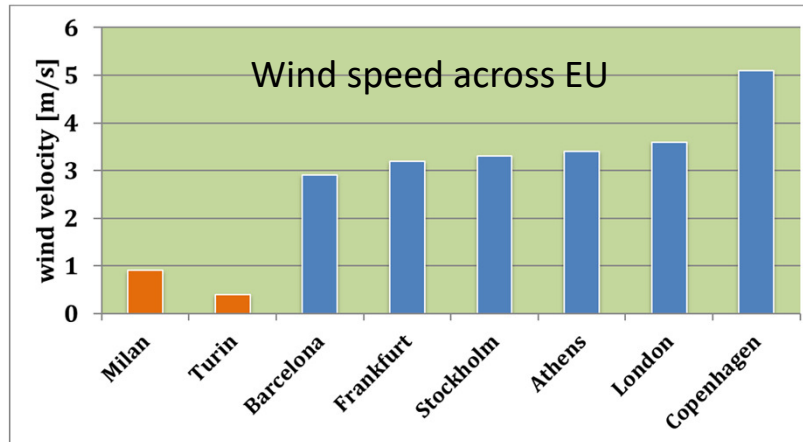
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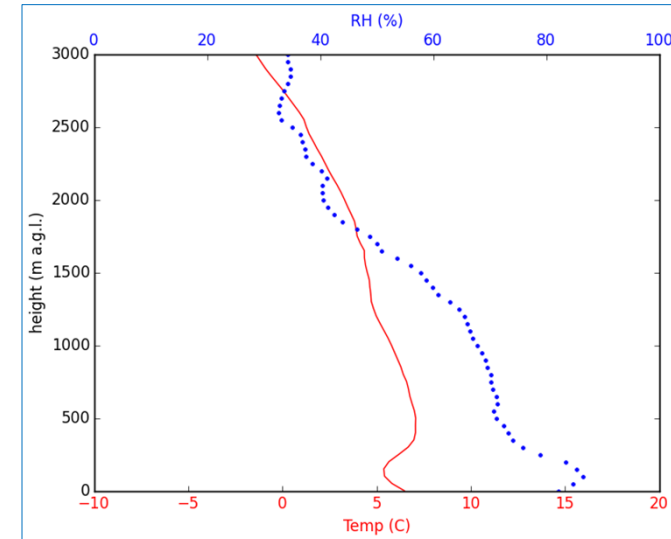
- Po Valley: closed by mountains exceeding 2500 m a.s.l. on three sides (highest peaks exceeding 4000 m a.s.l.)
- Meteorological conditions often adverse to air pollution dispersion

Meteorological conditions

In the Po Valley exceptional meteorological conditions occur due to the particular topography: the average **wind speed** and consequently the Thermal Inversion Height that makes **unfavorable** the conditions of **pollutants dispersion**.



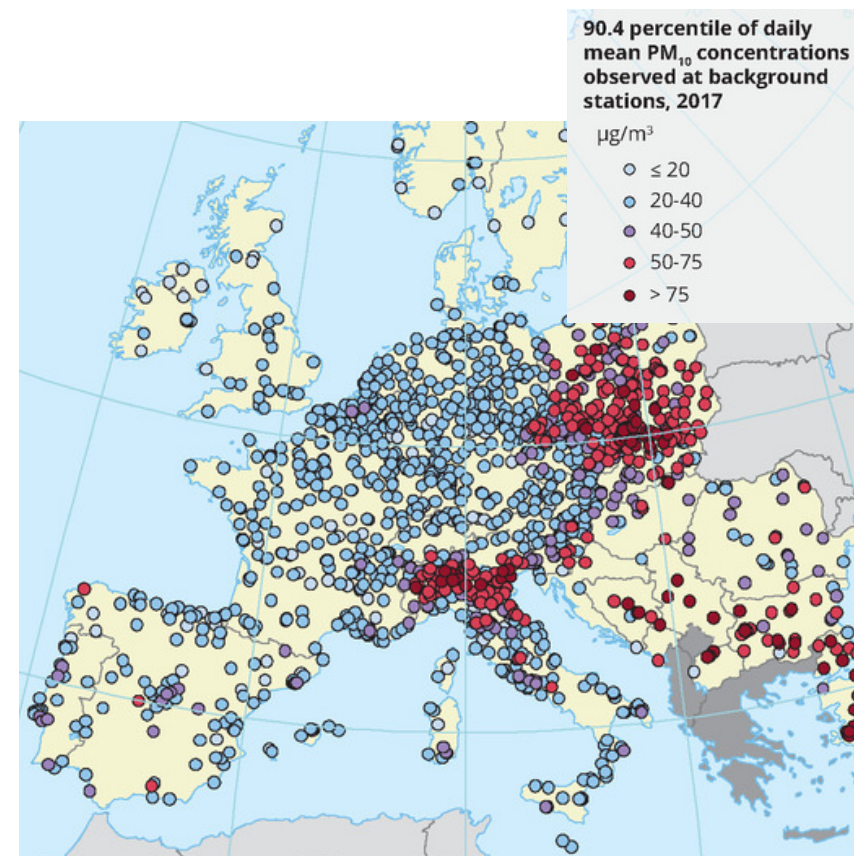
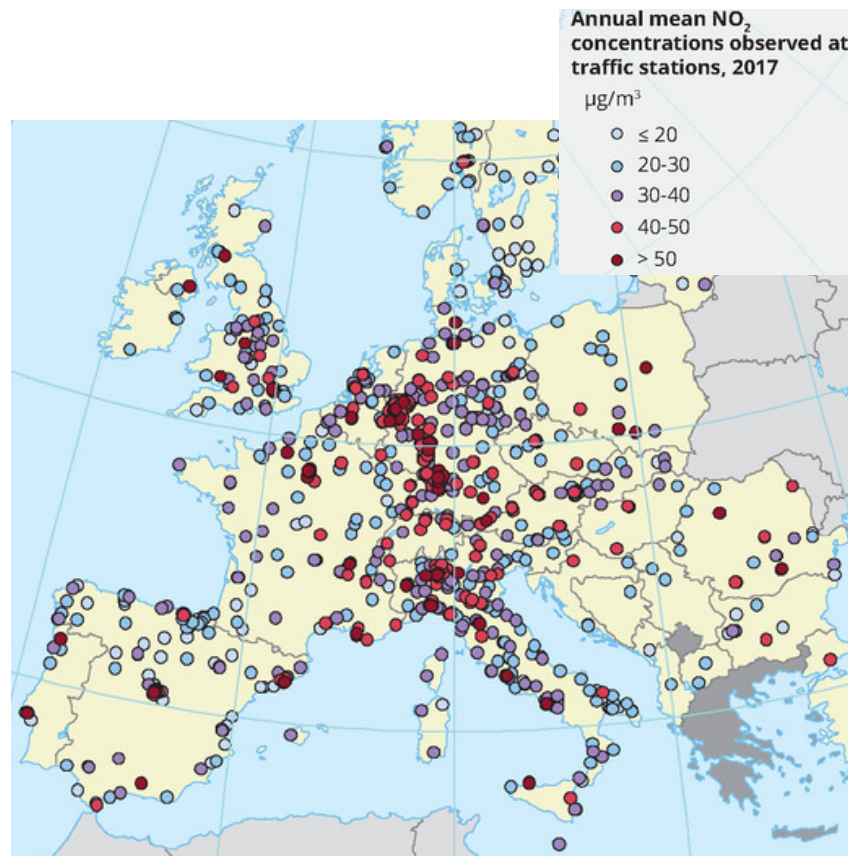
20 years annual average wind speed



MI-Linate December 2015

Monthly mean temperature and humidity at 12:00 GMT

NO₂ and PM₁₀ in Europe



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Some important regional actions

Coal and heavy oil ban for domestic heating from 2002

Methane distribution network in 98% of territory

Ban for low-efficiency households biomass burning from 2007

Large-scale traffic limitations

Authorizations and limits for all kind of plants (not only large plants) from 1988 more stringent and undertaken before than European provisions

Thermal power plants only if fuelled by natural gas in combined cycle turbine (NOx Emission limit of 30 mg/Nm³)



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Regional Emission Inventory

Major emissions come from diesel vehicles and domestic wood heating.
A widespread problem in millions of sources ...

98% from
biomass burning

Sector	NO _x	NH ₃	PM10	CO ₂ eq
Energy production and refineries	7 %	0 %	1 %	18 %
Residential combustion	10 %	1 %	42 %	20 %
Industrial combustion	15 %	0 %	8 %	15 %
Production processes	1 %	0 %	4 %	4 %
Extraction and distribution of fuels	0 %	0 %	0 %	3 %
Solven use	0 %	0 %	4 %	4 %
Road Transport	51 %	1 %	23 %	23 %
Other mobile sources	11 %	0 %	3 %	2 %
Waste treatment and disposal	2 %	1 %	0 %	3 %
Agriculture	1 %	97 %	6 %	11 %
Other sources and sinks	0 %	0 %	9 %	-3 %



RESTRICTION TO DIESEL
VEHICLES CIRCULATION



RESTRICTION TO THE USE
OF BIOMASS LOCAL SPACE
HEATERS

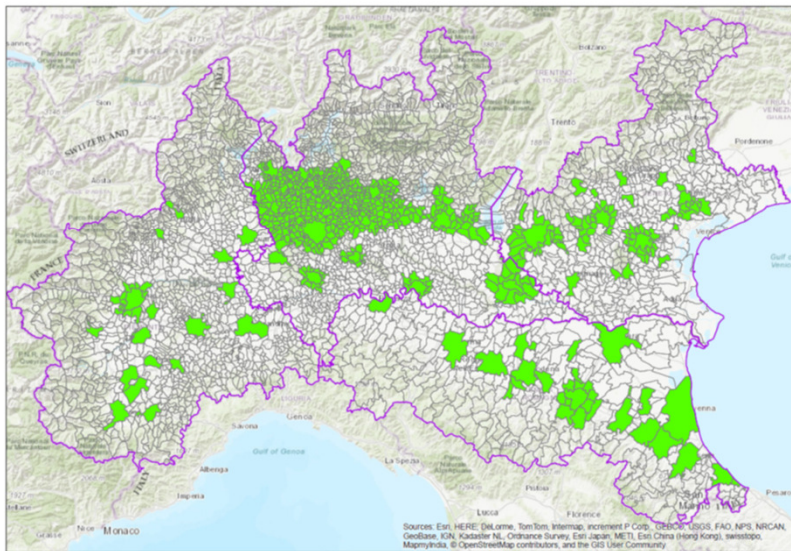


BAN TO THE USE OF
BIOMASS FOR ENERGY
EFFICIENCY DIRECTIVE
PURPOSES

BAN TO THE USE OF
PRACTICES WITH HIGH
AMMONIA EMISSIONS

Source: ARPA Lombardia - INEMAR 2017

Vehicles and biomass burning restrictions



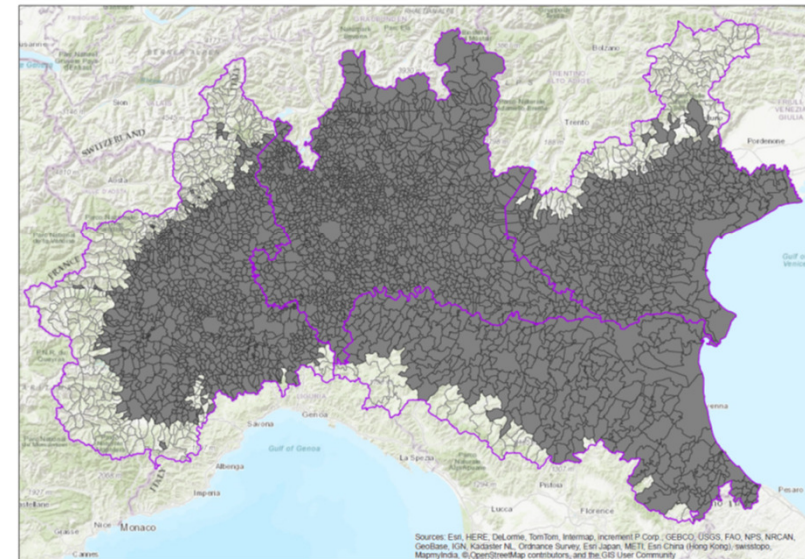
Traffic regional limitations:

570 municipalities and 7,8 millions inhabitants (78% of population)

Now → diesel Euro 3 (2001-2005)

From 2021 → diesel Euro 4 (2006-2010)

From 2025 → diesel Euro 5 (2011-2015)



Domestic biomass heating

- National regulation of heating systems by emissions (from ★ to ★★★★★)
- Regional regulation: permitted use of 3, 4 or 5 stars heating systems and permitted installation of 4 and 5 stars heating systems

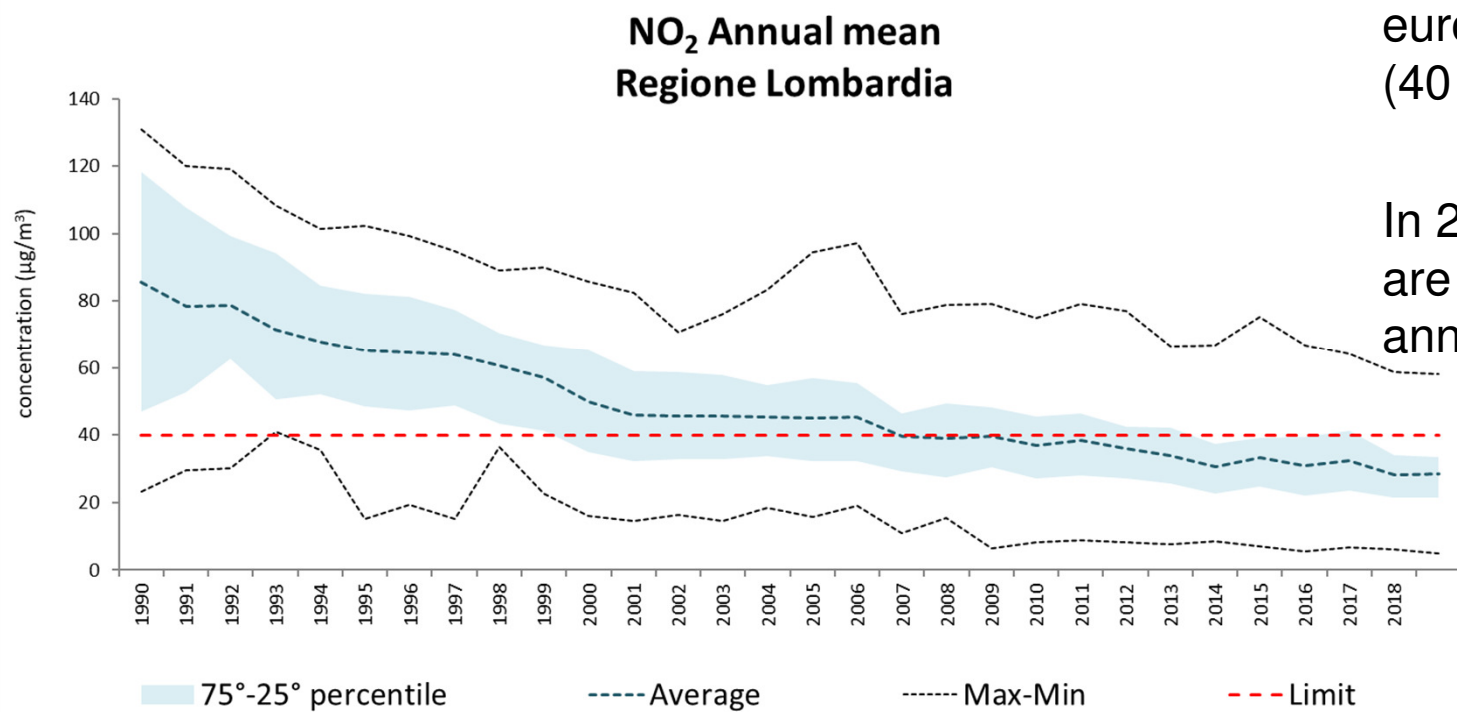


Millions of small pollution sources → a new important change of the market is needed

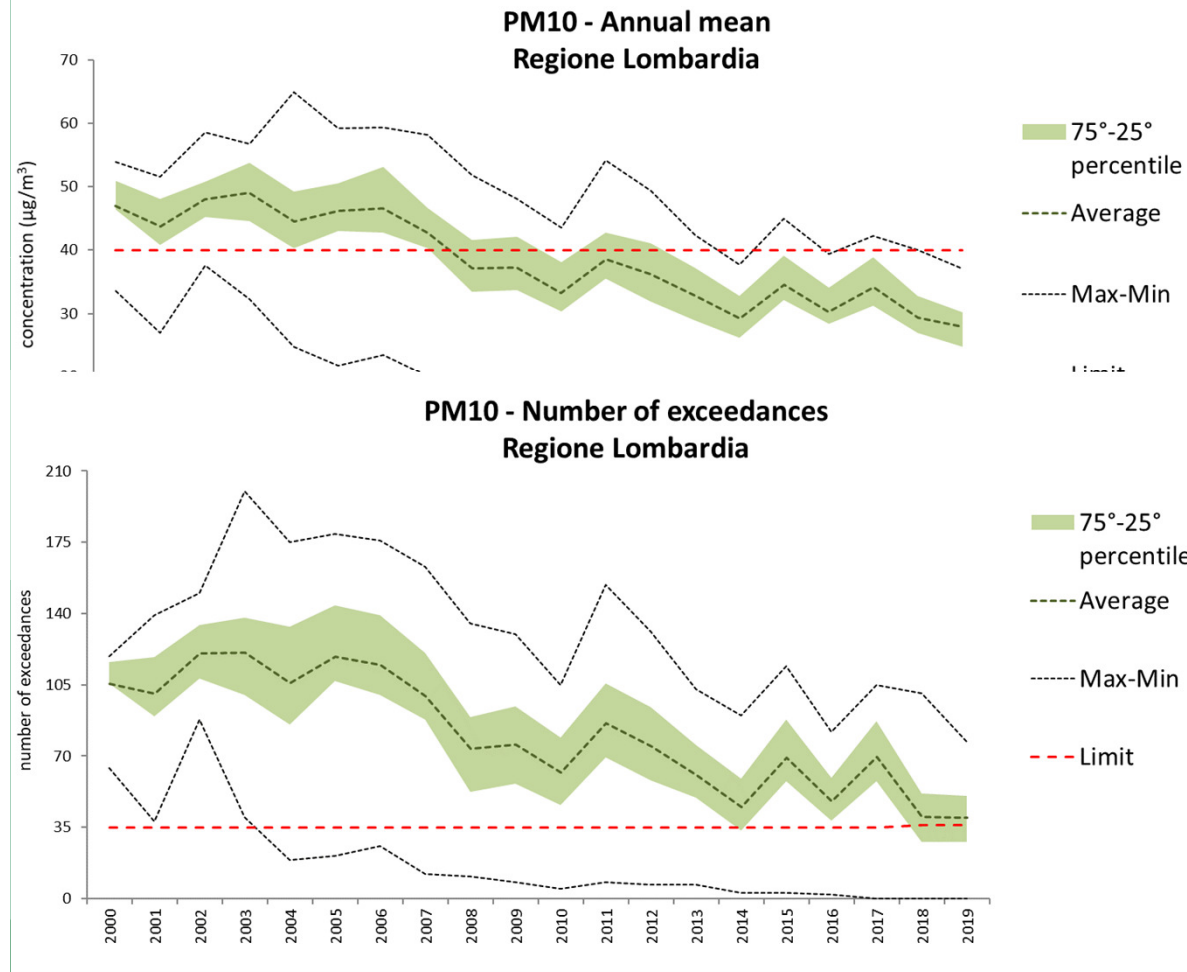
NO₂ – Annual mean

In 1993 all stations were above the european annual limit (40 µg/m³)

In 2019 93% of stations are below the european annual limit (40 µg/m³)



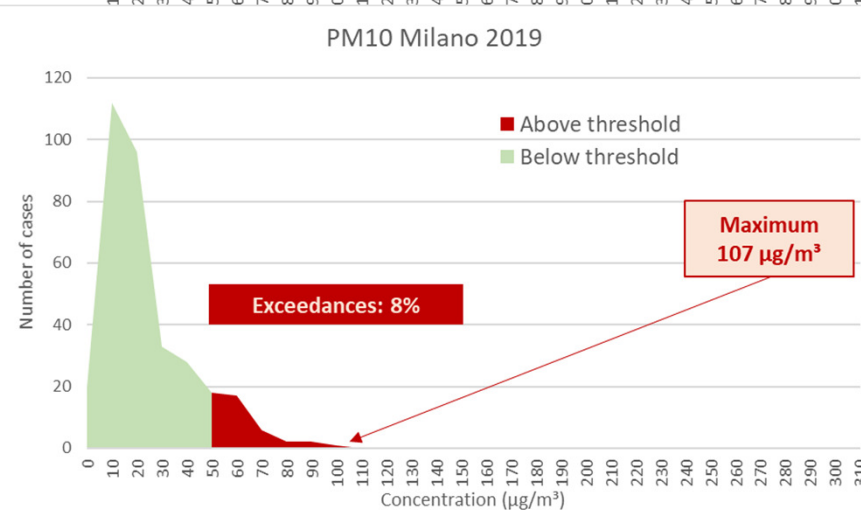
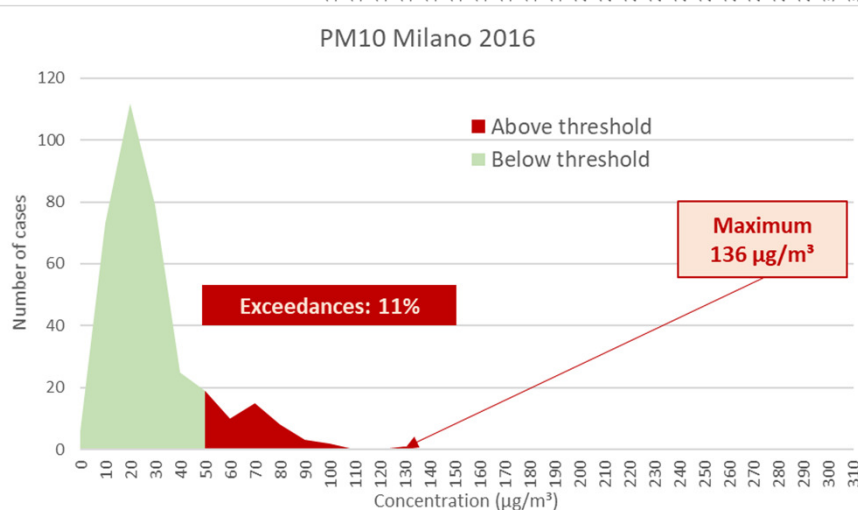
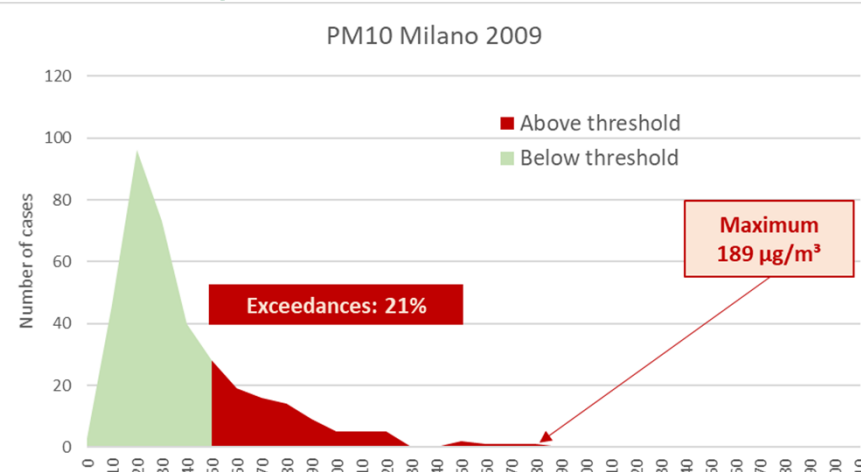
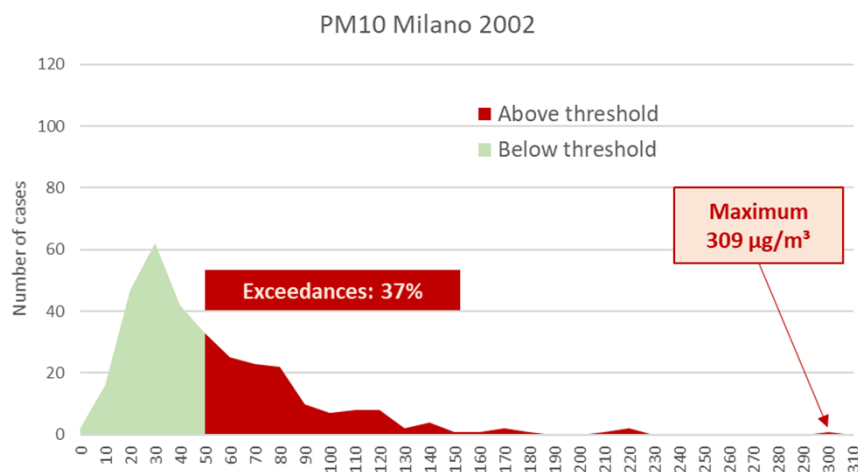
PM10 - Annual mean and daily exceedances



In 2019 all stations are below european annual mean limit ($40 \mu\text{g}/\text{m}^3$)

In 2019 52% of stations are above european daily limit (35 exceedances of threshold of $50 \mu\text{g}/\text{m}^3$)

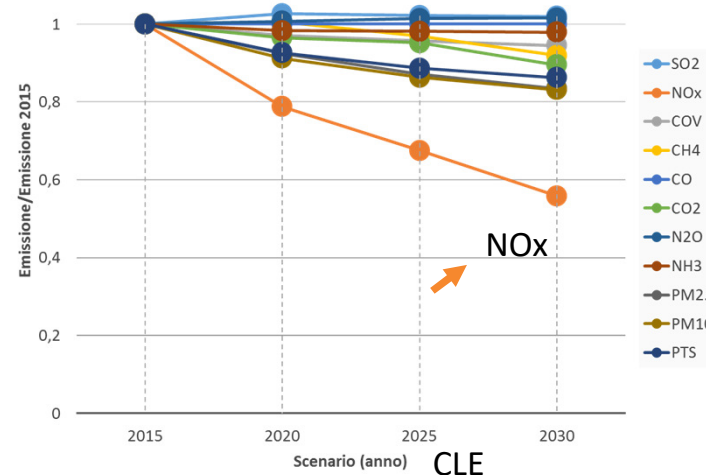
PM10 distribution of daily cases



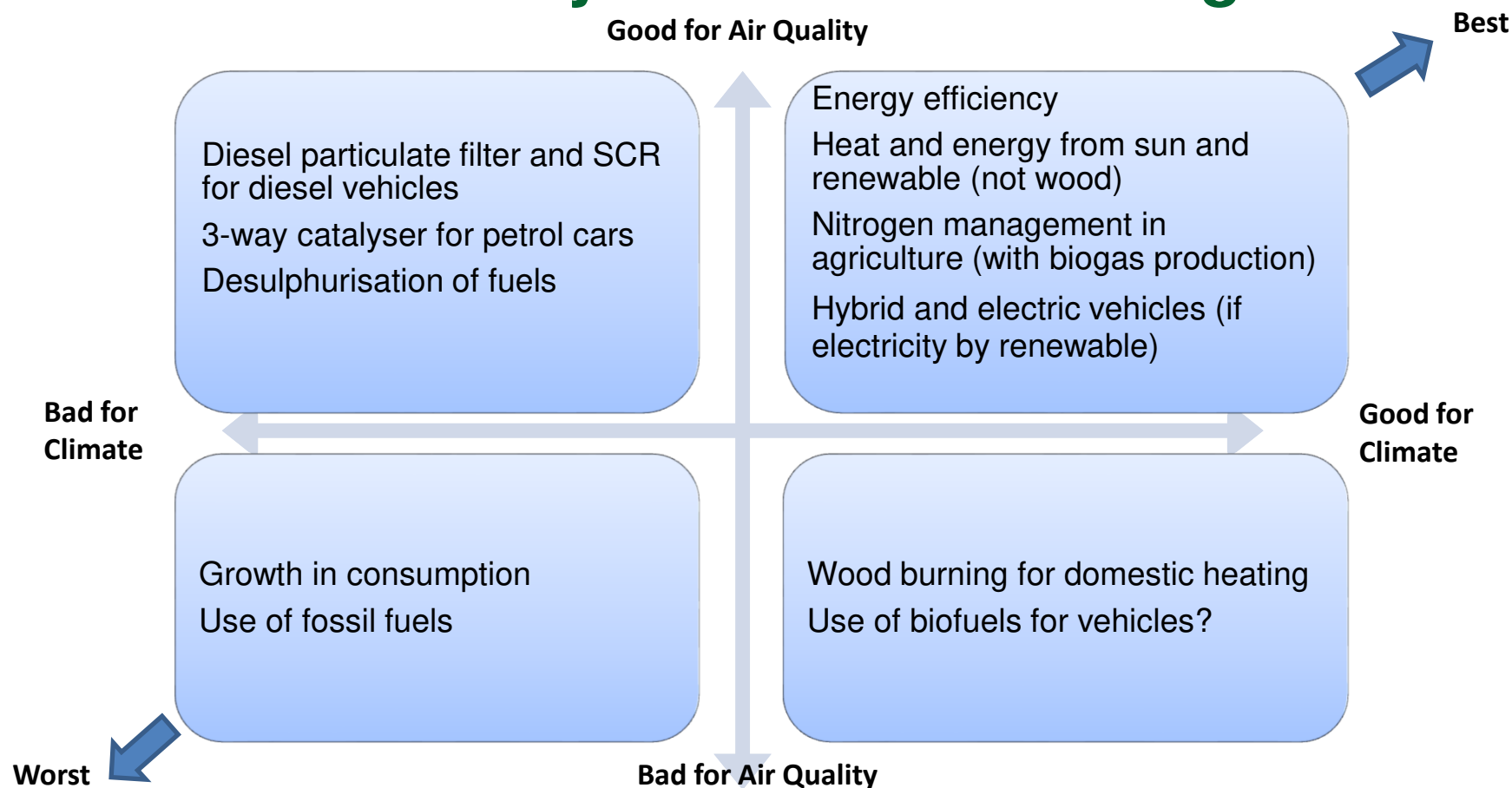
Emissions reduction for compliance to european legislation

	NOx	VOC	CO	NH3	PM2.5	PM10
CLE 2020	-21%	-3%	0%	-2%	-8%	-9%
CLE 2025	-32%	-4%	0%	-2%	-13%	-14%
Regional Air Quality Plan	-38%	-7%	-25%	-26%	-48%	-44%

- To respect the forecasting of NOx levels, it is very important that Euro6 diesel cars (and trucks) will register really the awaited decrease in NOx tailpipe emissions
- In the decrease of PM10 and PM2.5 emissions due to PRIA, it is very important the contribution of the measures related to biomass burning



Air Quality and Climate change

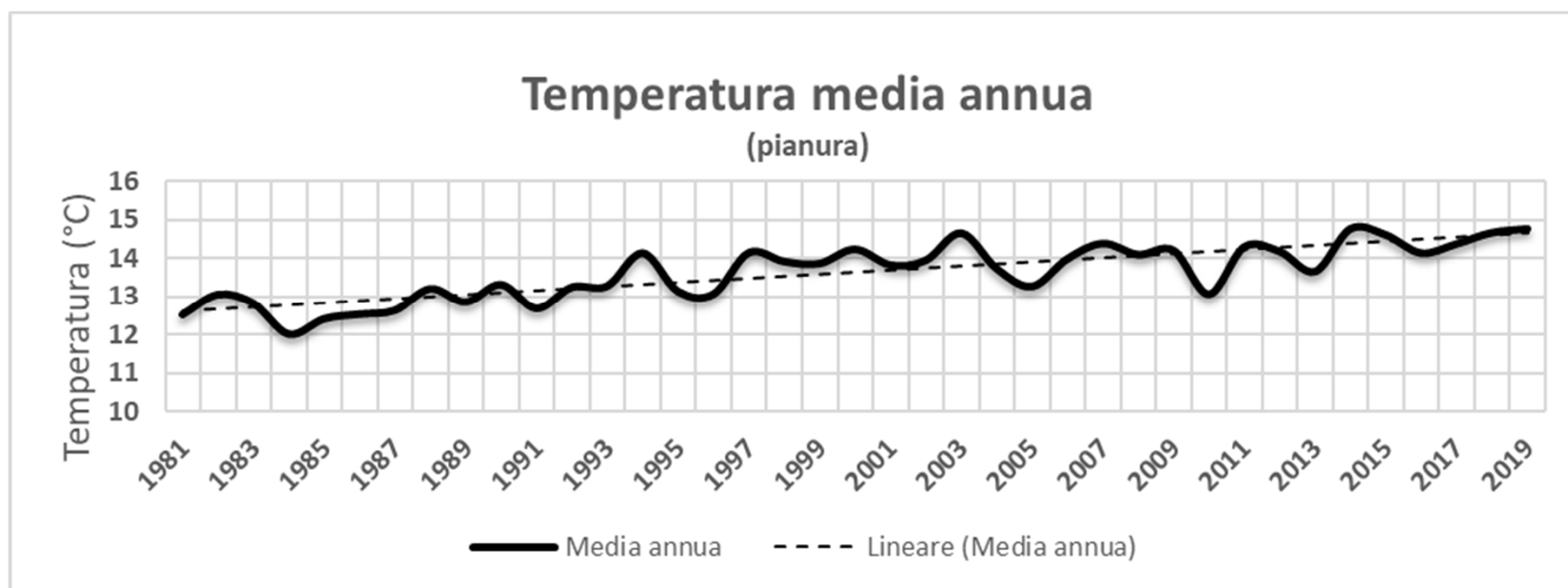


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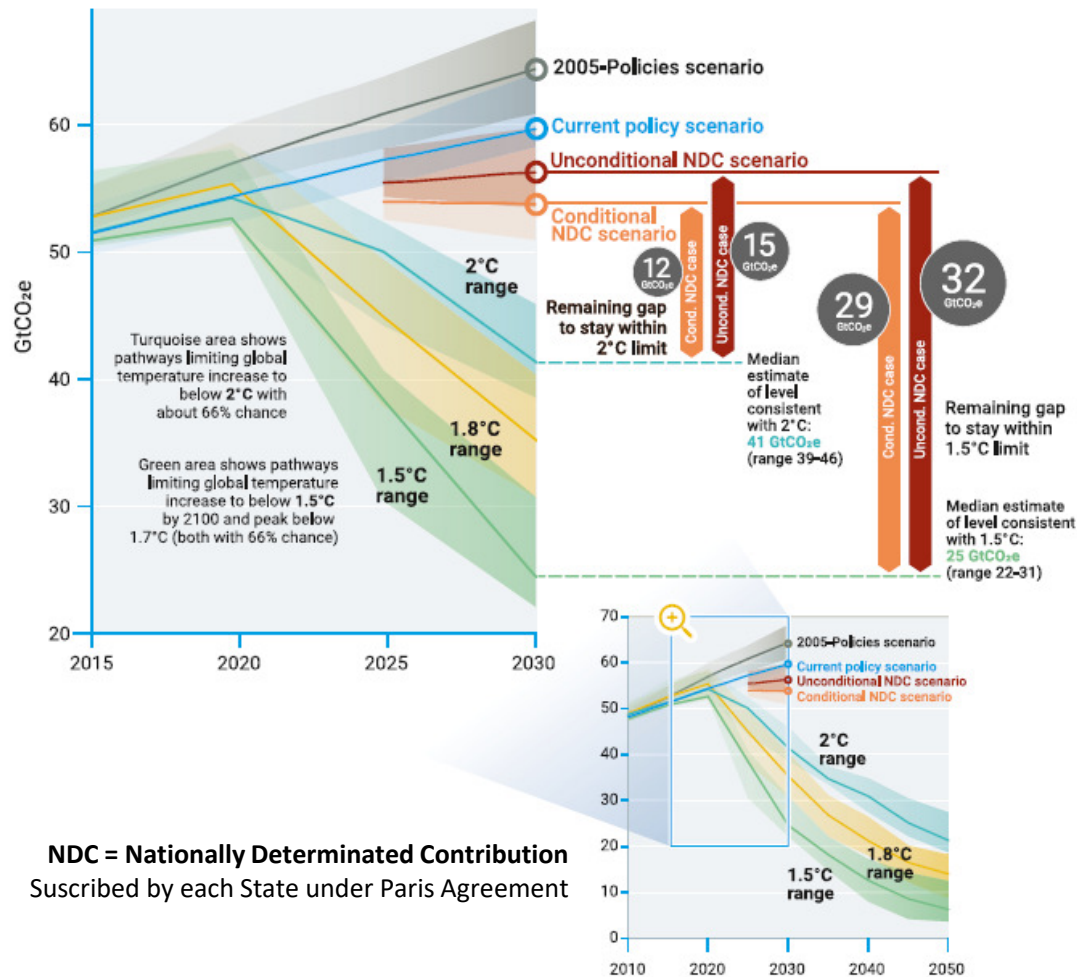
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Annual average temperature trend in Lombardia 1981-2019



Source: ERA5 Copernicus - ECMWF reanalysis, elaboration Arpa Lombardia.

Figure ES.4. Global GHG emissions under different scenarios and the emissions gap by 2030



Despite statements and governments commitment, global emissions continue to rise

If NDC were reached, there would still be an emission gap of 15 GtCO₂e for the +2 °C scenario and of 32 GtCO₂e for the +1.5 °C scenario

The NDCs should be tripled to reach the + 2 ° scenario and quintupled for the + 1.5 ° scenario

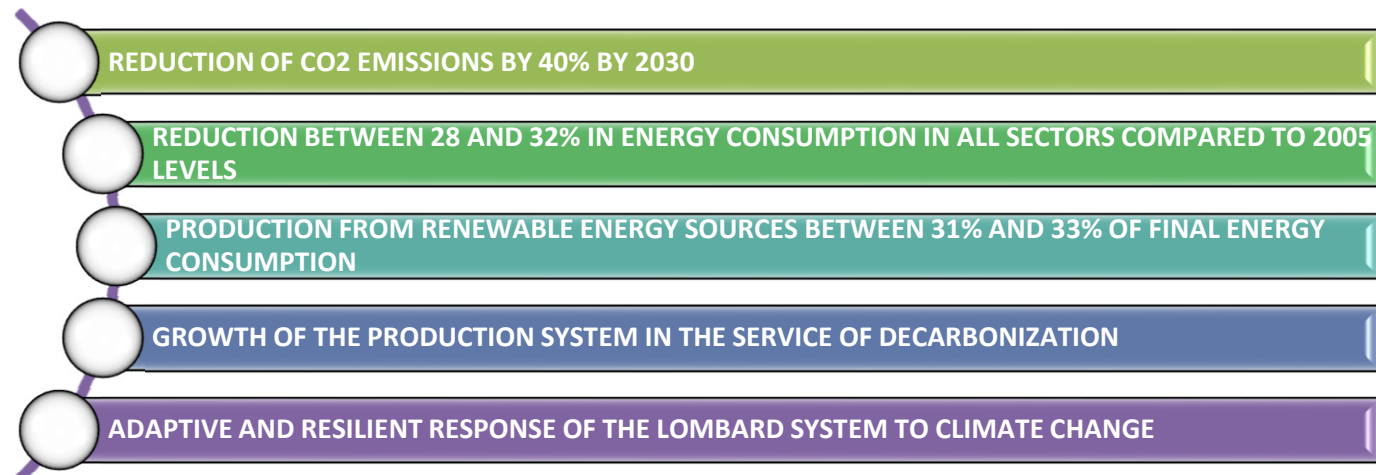
Regional planning:

Regional Energy Environment and Climate Program (PREAC)

Lombardia vision

Net zero emissions region by 2050 in a leading position in the commitment to implement climate policies, with a competitive, fair and sustainable economic system pursued with a progressive but disruptive innovation approach

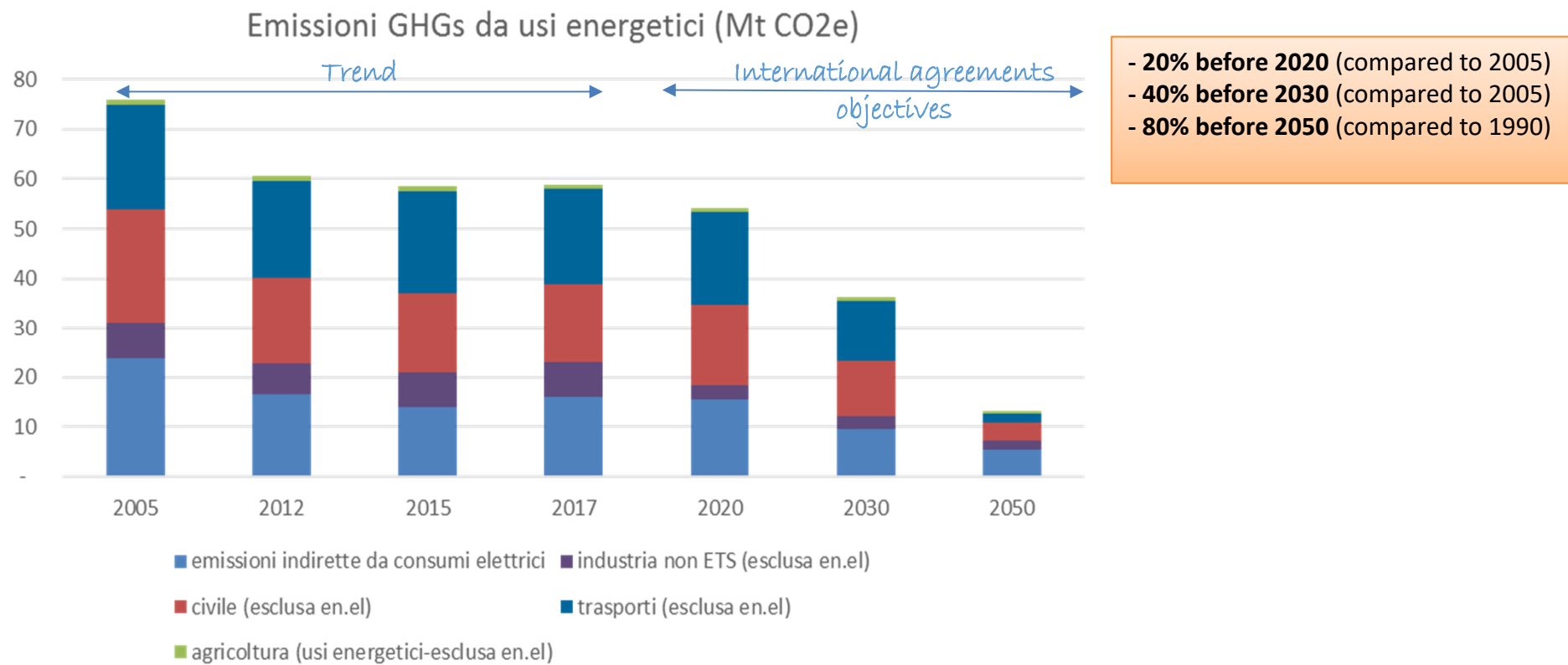
Macro-objectives



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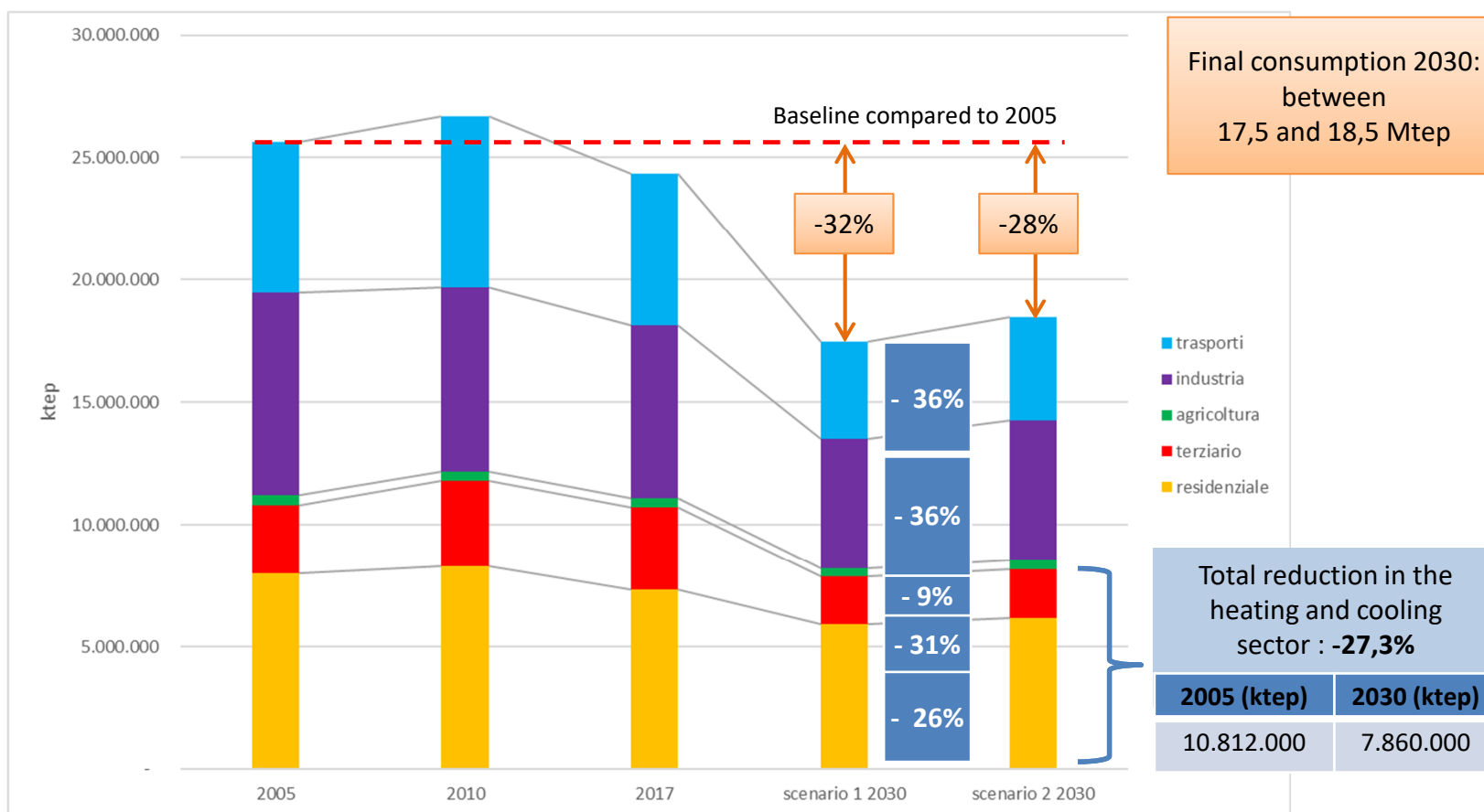
Actions in the national and international context



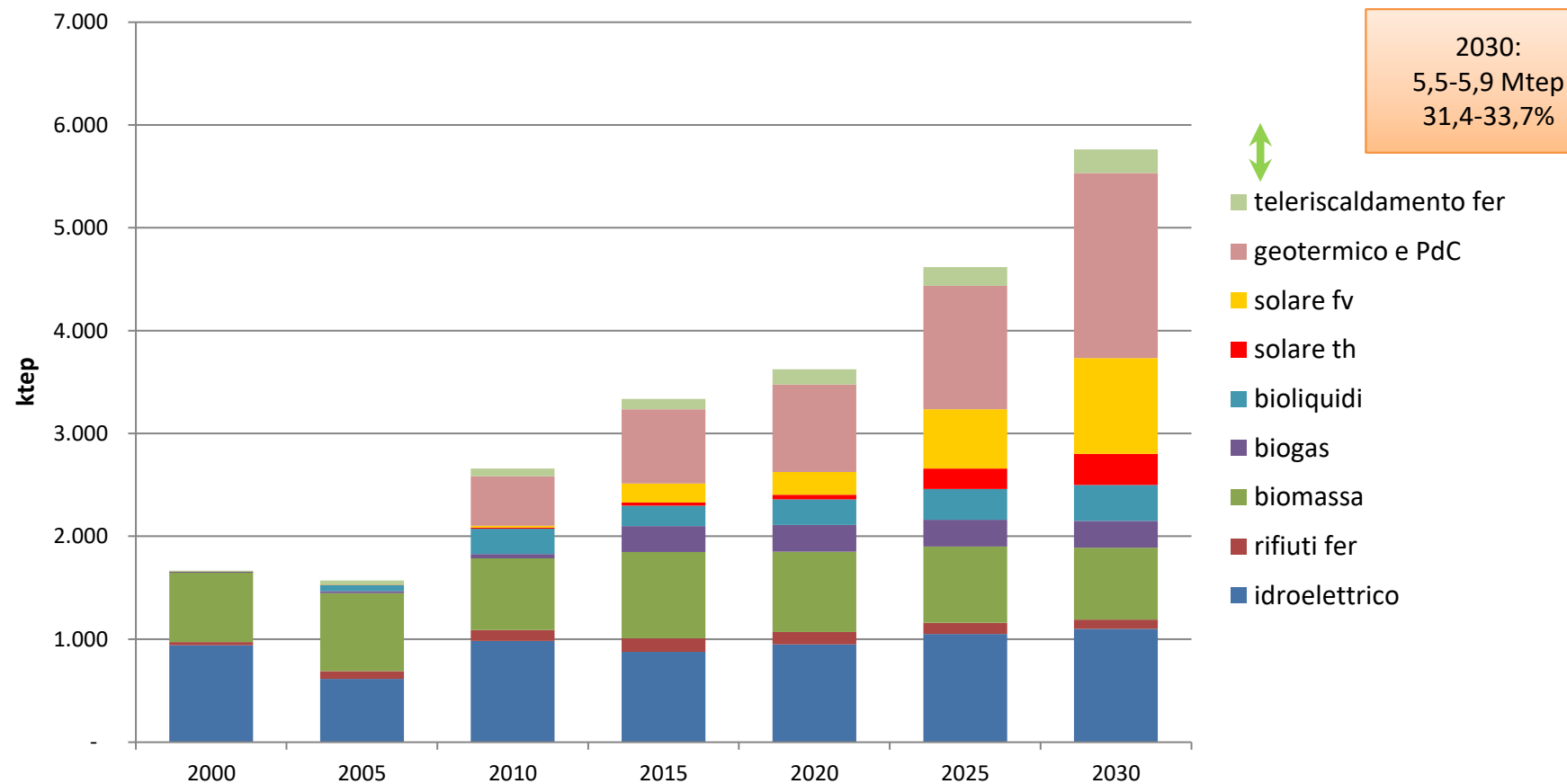
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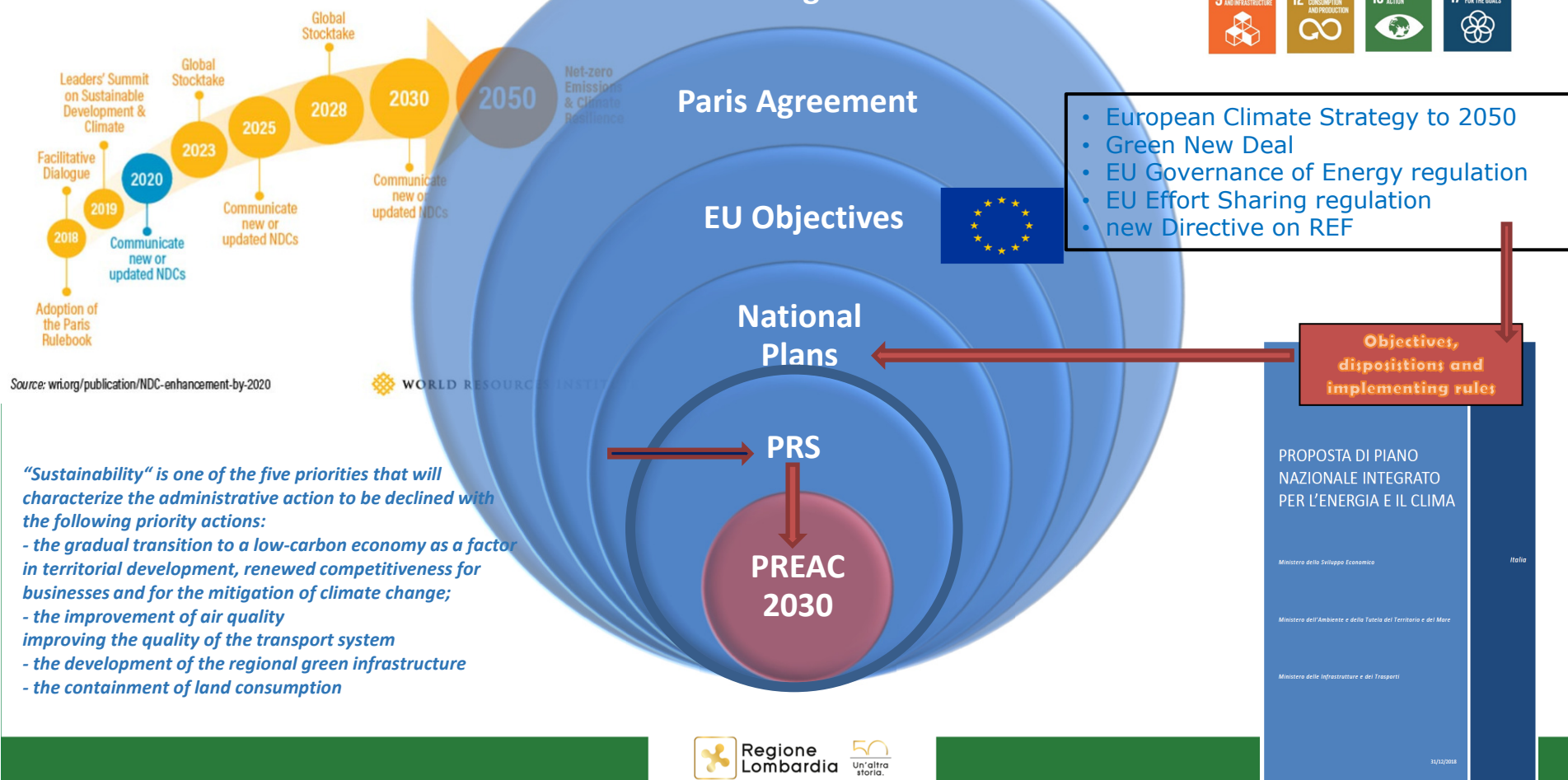
Breakdown of energy consumption reduction by sector

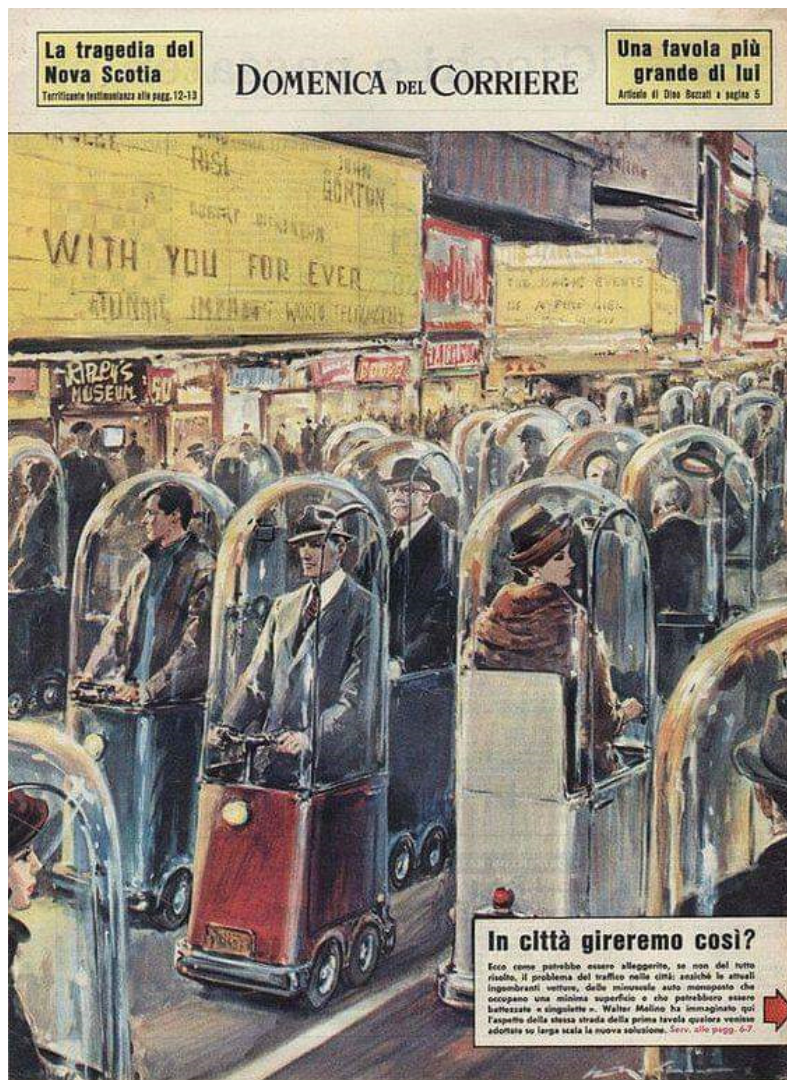


The 2030 goal of penetration of RES and the trend since 2000



Ambition Mechanism in the Paris Agreement





**Thank you for
your attention**

Will we go around town like this?

**“This is how the traffic problem in cities could
be solved”**

1962



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