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Po Regions Engaged to Policies of Air

Report 2 Covid-19 and air quality in the Po Valley

Disclosure summary from January to May 2020

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This document is the summary of:

REPORT COVID-19 – PRELIMINARY STUDY OF THE EFFECTS OF COVID-19 MEASURES ON ATMOSPHERIC EMISSIONS AND AIR QUALITY IN THE PO VALLEY – JUNE 2020

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Summary

The context

In the first months of 2020, the health crisis caused by COVID-19 pandemic and the consequent containment measures adopted generated a drastic and sudden reduction in some of the main sources of atmospheric pollution. The conditions have therefore been created to be able to test some actions to contrast air pollution in one of the most complex areas of Europe, that is Po Basin, which unfortunately is also among the areas most dramatically affected by the health emergency.

For these reasons, the PREPAIR project Steering Committee, consisting of the Po Basin Regions and Autonomous Provinces, the municipalities of Bologna, Milan and Turin, the Environmental Agencies of the Po Basin regions and of the Slovenian State, ART-ER and FLA, has decided to realize an ad hoc study to evaluate the effect of containment measures on air quality.

It has been planned to conduct the analysis in three consecutive phases:

- First evaluations with the data referred to the period February-March 2020, which led to the first REPORT COVID-19 of June2020
- Extension of the analysis to the months of April and May 2020, and refinement of the evaluations, included in the second report
- Scenario simulation with lockdown emissions extended to the whole year 2020.

This document is a short summary of the "Covid-19 Report 2- preliminary study of the effect of Covid-19 measures on the emissions into the atmosphere and into the Po Valley air quality", referred to the months of February, March, April and May 2020, which aims to provide some initial evaluations on the effects of the containment measures adopted in Italy and in the Po Valley, in order to analyze strategies to contrast air pollution and to better understand the dynamic and complexity of the phenomenon itself.

1. The lockdown measures

On February 24th the emergency measures to contain the spread of the COVID-19 epidemic were activated. Two "red zones" were established, corresponding to the first outbreaks in Codogno and Vo' Euganeo. Schools were closed in Lombardy, Emilia-Romagna and Veneto.

The Table 1 shows the chronology of the main containment measures from February 24th to the end of March.

24 February	**DL 23 February 2020 n 6** **DCPM 23 February 2020**	Establishment of the "**Red Zone**" for the Municipalities, sites of the outbreak, in Lombardy and Veneto (Codogno, Vo' Euganeo) Closing of schools and universities in Lombardy, Emilia-Romagna and Veneto
26 February	**DCPM 25 February 2020**	Suspension of sporting events, educational trips and other limitations on the whole national territory
2 March	**DPGR Piemonte n. 24 1 March 2020**	Closing of schools in Piedmont.
8 March	**DCPM 8 March 2020**	Establishment of the "**Red Zones**" of Lombardy, Veneto and the Provinces of Modena, Parma, Piacenza, Reggio Emilia, Rimini, Pesaro and Urbino, Alessandria, Asti, Novara, Verbano-Cusio-Ossola, Vercelli, Padua, Treviso and Venice. National closing of pubs, dance schools, game and betting rooms, discos and more, restrictions regarding access to residential structures for the elderly (RSA)

10 March	**DCPM 9 March 2020**	Italy Red Zone Extension of all measures of the DCPM 8 March to the national territory: Prohibition of assembly on the whole national territory.
12 March	**DCPM 11 March 2020**	Closing of retail stores with the exception of basic necessities (Food, Pharmacies and others)
23 March	**DCPM 22 March 2020**	Lockdown Closing of non-essential production activities.

Table1 –Containment measures timeline

2. Impact of the lockdown on polluting emissions in atmosphere

The restriction measures just described impacted most of the activities emitting pollution in the air, with different intensity depending on the sector and to an increasing extent as the restrictions intensified.

Emissions have been estimated on the basis of activity indicators, for example traffic flows or fuel consumption data. As far as possible, homogeneous methodologies have been adopted throughout the study domain.

Almost all the emissions considered gradually decreased, with the tightening of the containment measures, with more marked effects on transport, less marked on the industrial sector and electricity generation and even a slight growth for domestic heating. Emissions from agriculture and animal husbandry are considered essentially unchanged.

Starting from the end of April, with the loosening of the restrictive measures, emissions began to grow again, gradually returning to align with the normal levels for that season, in any case lower than the winter levels (given the reduction in consumption for heating).

Figures 1 and 2 show the variations in NOx and PM10 estimated over the entire Po basin and the individual regions, respectively.

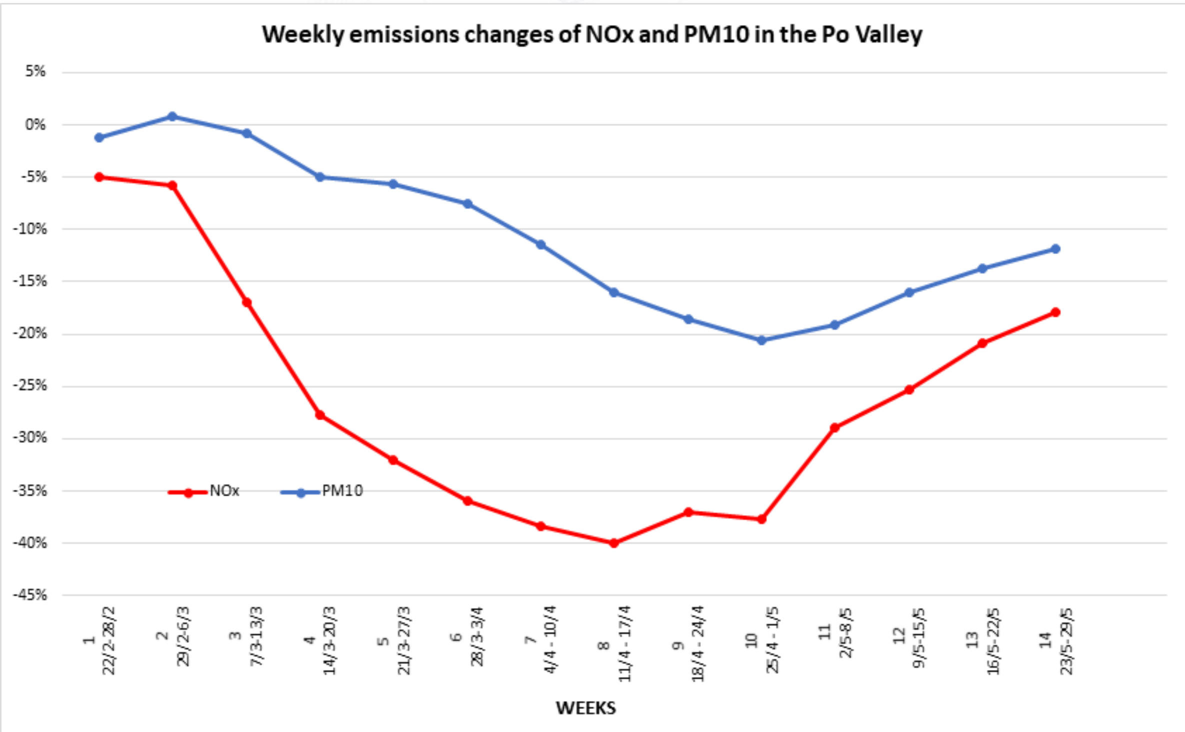


Figure1–Nox and PM10 weekly emission variations (%) in the Po Valley (February 22nd–May 29th2020)

As an average of the Po basin, NOx emissions progressively decreased in all territories as the restrictive measures came into force, reaching a maximum average reduction of almost 40% in mid-April, while direct emissions of PM10 decreased until they reached a maximum average reduction of 20% at the end of April.

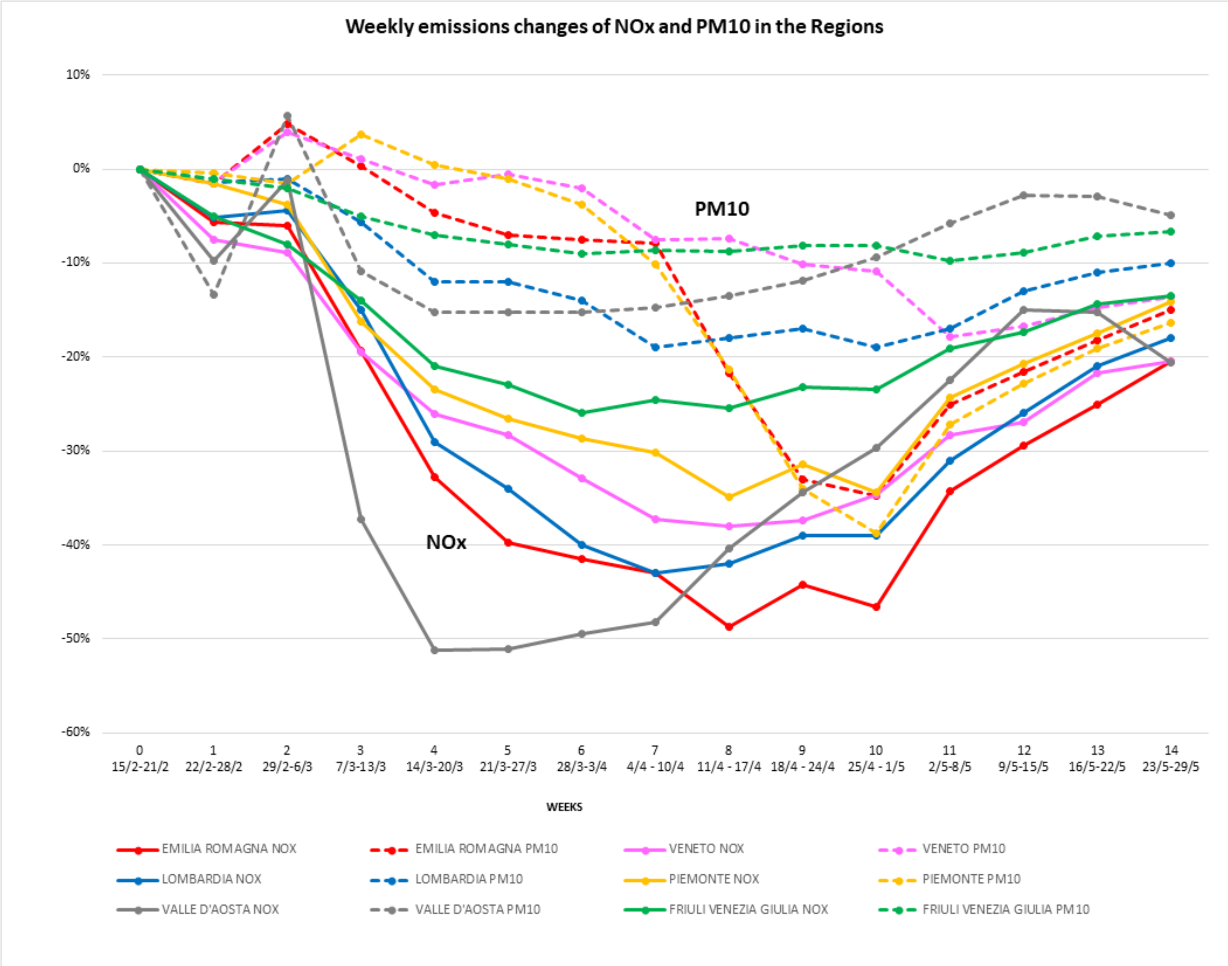


Figure2–Weekly emission variation (%) of Nox and PM10 in the different Region (February 22nd - May 29th, 2020)

The largest reductions have been estimated for nitrogen oxides in April in Emilia-Romagna and Valle d'Aosta. The trend of PM10 emission shows very marked reductions for Emilia-Romagna and Piedmont in April, while in the other regions of the Po basin they are not so strong. Starting from the first week of May, with the easing of some restrictive measures and the restarting of some activities (DPCM April 26th, 2020) the trend reversed and emissions gradually increased.

3. Meteorological analysis

The topographical characteristics of the Po Valley strongly influence the local meteorology, leading to the typical climate of the region characterized by low winds, particularly weak in the winter months. In the Po Valley the most important contribution to vertical mixing in the PBL (Planetary Boundary Layer) comes from the thermal component (vertical overturning due to buoyancy, mostly in summer and intermediate seasons).

On the contrary, during wintertime, there are frequent thermal inversion conditions near the ground, particularly at night. This creates a single layer of diffuse and uniform pollution in the lowermost portion of atmosphere. Under these conditions, which can sometimes persist throughout the day, the

dispersion of pollutants is severely hampered, with the primary pollutants tending to progressively accumulate near the ground, reaching high concentrations, and therefore favouring the formation of further secondary pollution.
In the meteorological analysis conducted by the Prepair working group, 3 indicators were analyzed:

- **Stagnation** detects day with weak wind and low boundary layer height ;
- **Recirculation** identifies the wind regimes that keep the pollutants in a circumscribed area;
- **Ventilation** is an indicator of the ability to dilute pollutants and encourage their dispersion.

In the first two cases high index values show favorable conditions of pollutants accumulation, in third the opposite occurs .

The study of the frequency distributions of the indicators has shown a remarkable seasonal trend, more appreciable for the stagnation and ventilation, tending to go towards small and large values respectively as the season progresses (Figures. 3, 4 and 5).

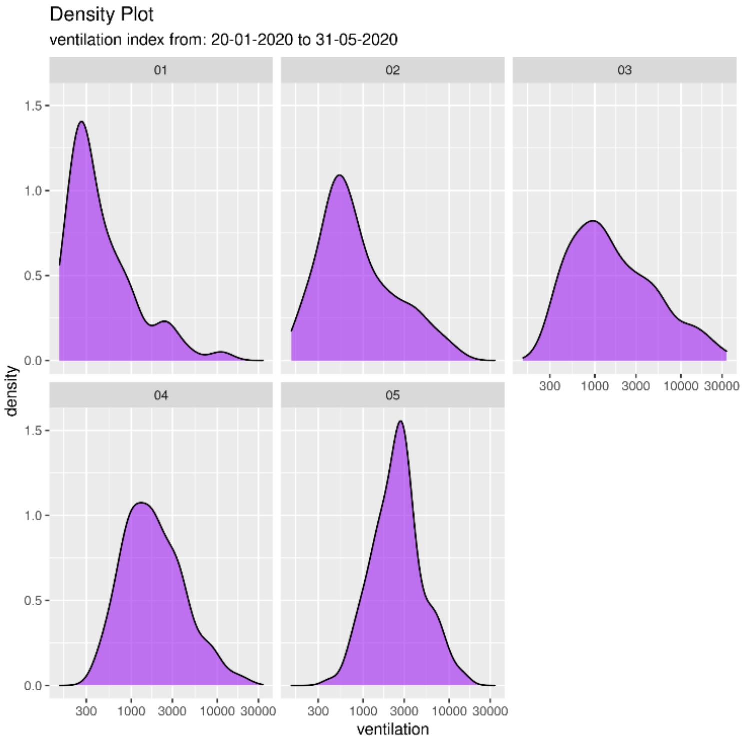


Figure3 – Monthly density plot for the ventilation index from January 20thto May 31st.

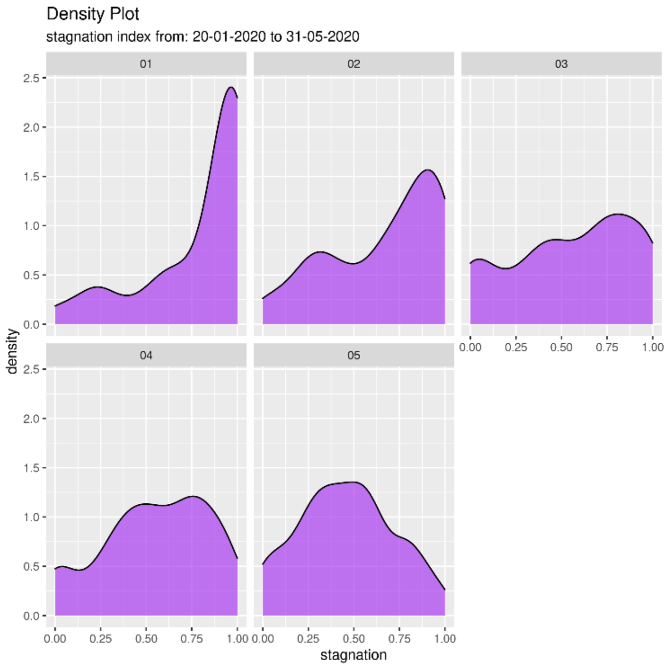


Figure4 –Monthly density plot for stagnation index from January 20th to May 31st.

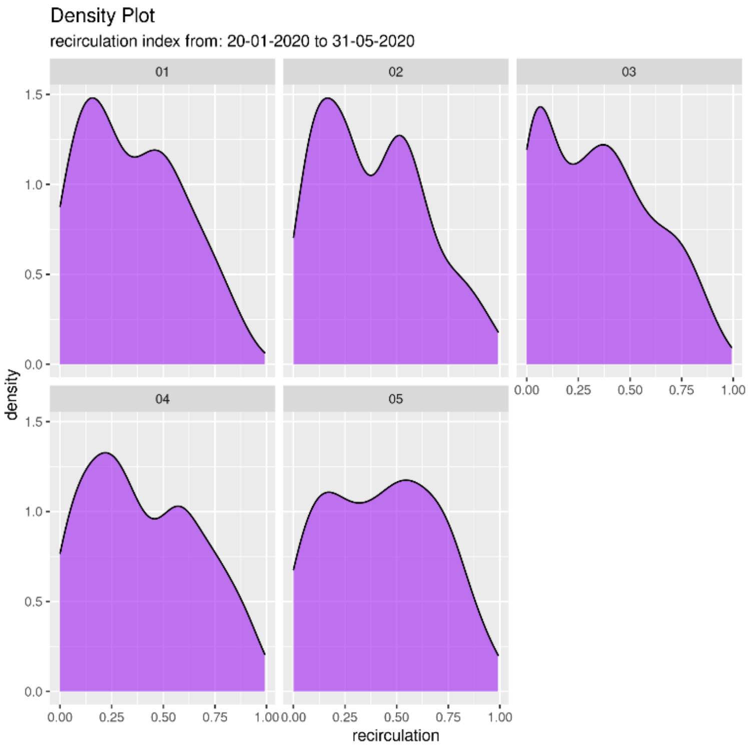


Figure 5 –Monthly density plot for recirculation index from January 20th to May 31st.

Analyzing in a more detail way month per month:

- March has been characterized by mostly stable weather conditions with frequent interruptions due to atmospheric perturbations.

  Intermediate periods have been characterized by prevailing conditions of stability favoured by several high-pressure comebacks, with low mixing height especially around the half of the month. In the last days of March a strong dusts transport coming from east Europe occurred, as shown in ESA SENTINEL – 3 satellite pictures (Figure. 6) and in PM10daily temporal trends

Figure6 -Images captured by satellite SENTINEL 3, left the Sea of Aral for the day of 24 March 2020 right the North of Italy for the day of March 28th 2020.

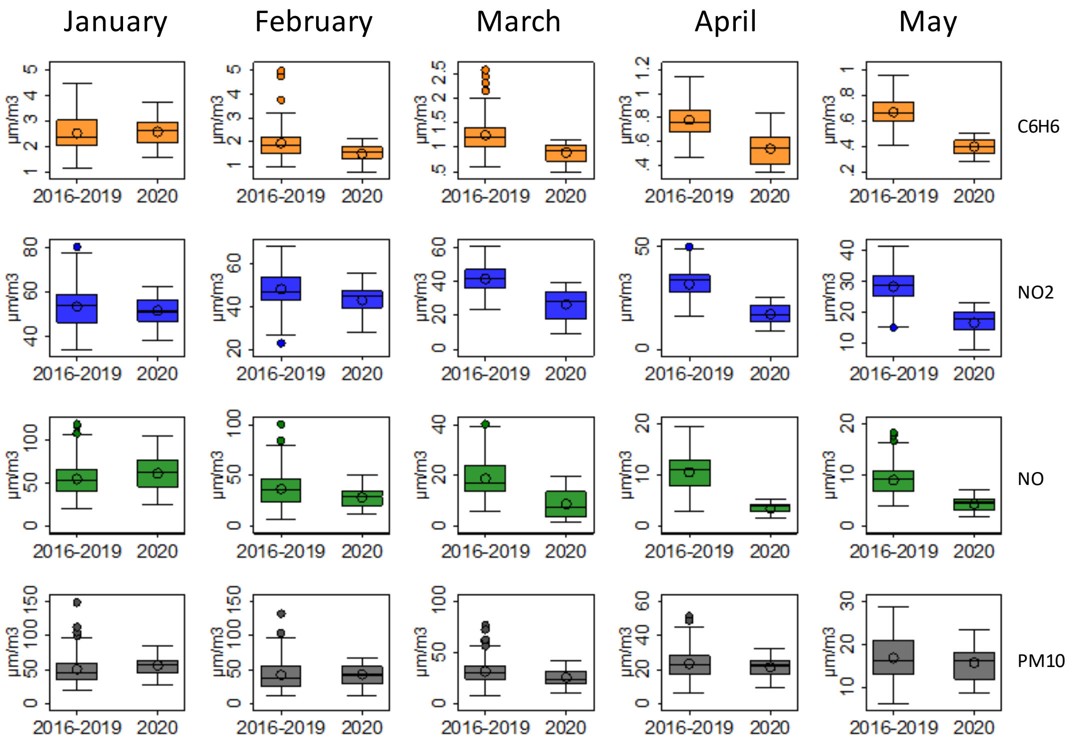
- The month of April, in its first days is characterized by very cold north-east currents, associated with stability in Northern Italy with indicators that reveal the presence of a stable continental air mass in lower atmosphere layers. After a temporary increase of the wind intensity, from 5-6 of April there are general conditions of stability, which ends on April 14th due to colder currents from east. The subsequent resumption of the baric field promotes stable and sunny weather, that persists until an Atlantic depressionary wave transit between 19 and 22 of April, followed by a new increase of stability. The last four days of the month, from 27th to 30th, are characterized by a marked variability. The alternation of these phases is well correlated to the meteorological indicators trend in the considered period.
- The month of May is characterized by an alternation of stable period and the transit of different disrupted systems. After the first days of the month, characterized by a weak instability, subsequently it states a high-pressure field until the second decade, when occurs a reinforcement of the wind from the south-western quadrant over Northern Italy and widespread rains. After, there are more stable conditions until the day 15thand immediately following, when a depression on the West Mediterranean Sea causes intense southern air flows above the all entire peninsula and also a large transport of Saharan dust toward the Middle-South of Italy. From the day 20ththere is a return of more stable conditions until the day 24th, when we first have a wind intensity increase and then widespread rains and showers. In the last days of the month, from the 29thonward, there is a resumption of the pressure field with a more stable weather.

4. The air quality analysis

The analysis of air quality data in the Po Basin was conducted on 5 pollutants: NO_2, NO, PM_{10}, $PM_{2.5}$ and benzene, plus ammonia (NH_3), where the data were available for analysis. The data were collected throughout the Po Basin using the air quality monitoring stations of the network of Prepair partners.

Boxplot graphics

Boxplot graphics synthetically show the data set distribution. In figure 7, is shown the monthly comparison between the collected data daily average from January to May 2020 and the one of the same months in 2016-2019, of benzene concentrations, NO_2, NO, PM10. In the last boxplot is, instead, reported the comparison of the NH_3 daily average of April and May in 2020 and 2016-2019.



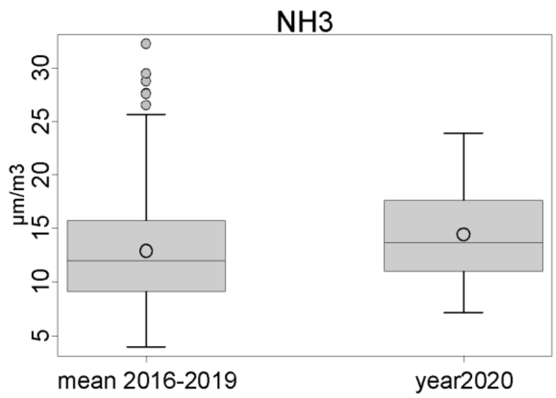


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Figure7–Montlhy comparison of benzene, PM10, NO_2 and NO daily concentration in2020 (without dust transport days on March) and 2016-2019[1] (top) and of NH_3 daily concentration (below) for April and May.

[1]Each box is at the top and at the bottom bounded by the first and the third quartile (25° and 75 ° percentile respectively at the center there is an horizontal bar representing the median (50° percentile: value higher than 50% of the considered data); vertical bar that come out of the box represent the minimum and the maximum and are calculated on the basis of the Inter-

On the basis of the diagrams above it is possible to draw some considerations:

- The median of all gases significantly decreased in the period April - May 2020 compared to the same months of 2016-2019; the median of PM10 does not show variations but, as for the first quarter, a decrease in the highest concentrations is observed (the isolated dots at the top of the box);
- The ammonia detected in the stations in Emilia-Romagna (2 stations), Piedmont (2 stations) and Lombardy (10 stations) shows only a slight increase in 2020.

The temporal trend

Figure 8 shows the daily trend of the main pollutants in the Po valley in 2020 (average data on the Po basin).

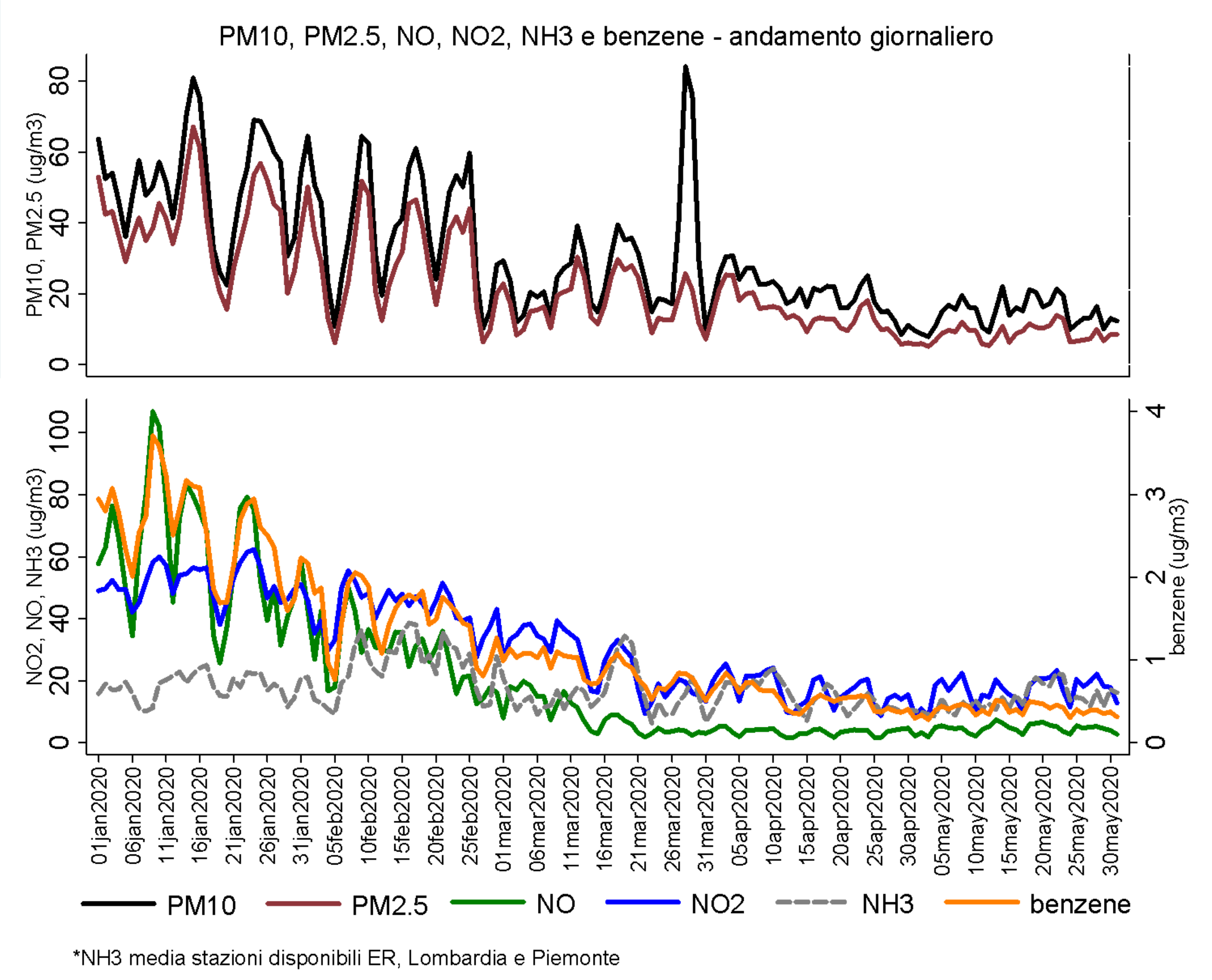

Figure 8 - Top graph: temporal trend of PM10 and PM2.5 (Po valley average concentration- urban background); bottom graph: trend of benzene, NO, NO_2 (traffic stations) and NH_3 (mixed stations of Emilia-Romagna, Lombardy and Piedmont).

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quantile range (IQR, difference from the first and the third quartile) multiplied by a factor (1.5); the outlier are represented as dots and are higher and lower values than vertical bars.

The primary pollutants (that are emitted directly, i.e. NO and benzene) are constantly decreasing over the entire area under study, while the particulate matter (PM10 and PM2.5) presents a trend more related to weather conditions and with a variable spatial distribution on the basin.

Ammonia shows a peculiar trend as its emissions have a characteristic temporal modulation, significantly influenced by the different phases of agricultural and livestock activities, which in turn depend on meteorological variables.

In addition, the ammonia trend shown in the second graph in Figure 4 represents the average between measurements made in different stations, whose trend over time can be more or less influenced by the temporal modulation of agricultural and livestock emissions. The stations are in fact located in very different positions, some in urban areas, others in rural areas, where agricultural activities or livestock are more relevant.

5. Estimation of the impact of the Lockdown on air quality

To estimate the actual impact of the containment measures on air quality, it is not enough to compare the measurements recorded by the monitoring stations in the early months of 2020 with the measurements recorded in previous years.

In fact, a hypothetical spring 2020 without *lockdown* would certainly not have registered the same concentrations as in 2019 or in previous years, and not even the same as in the first months of 2020, because meteorology - a crucial factor for air quality - changes from year to year and with the seasons.

To obtain a reliable estimate of the effect of the *lockdown*, it is necessary to compare the real scenario, given by the measurements recorded by the air quality monitoring stations, with a hypothetical "NO-LOCKDOWN" scenario, ie with the situation that would have occurred in absence of restrictive measures developed on the basis of a mathematical model.

The "NO-LOCKDOWN" scenario of the Prepair project was reconstructed with two chemical transport models: NINFA-ER and FARM-PI, simulating the air quality over the whole of Northern Italy in the first months of 2020 using real 2020 meteorology and the emissions expected in a “normal” year, ie without *lockdown*.

The simulation of the first two months of the year, before the adoption of restrictive measures, allows you to calibrate the models by adjusting them to the data observed by the control units. After that the real scenario begins to diverge with the two hypothetical models, and the difference can only be attributed to the emissions reductions determined by the *lockdown*.

Figure 9 represents the percentage reductions of the real scenario compared to the hypothetical "NO-LOCKDOWN" scenario:

- for nitrogen dioxide NO2, at the end of March the reductions reached median values in the Po Valley of about 35-50%;
- for PM10 the reductions are smaller, more differentiated by geographic area, more variable in the different weeks, but still reach a median reduction of 15-30%.

The method was subjected to a counter-test, applying it to 2018: in a year without lockdown the hypothetical scenario should not tend to diverge from the real data. The test had a good outcome, confirming the reliability and robustness of the method: no trend divergence was observed and the median differences between the two scenarios are between -15% and + 15%.

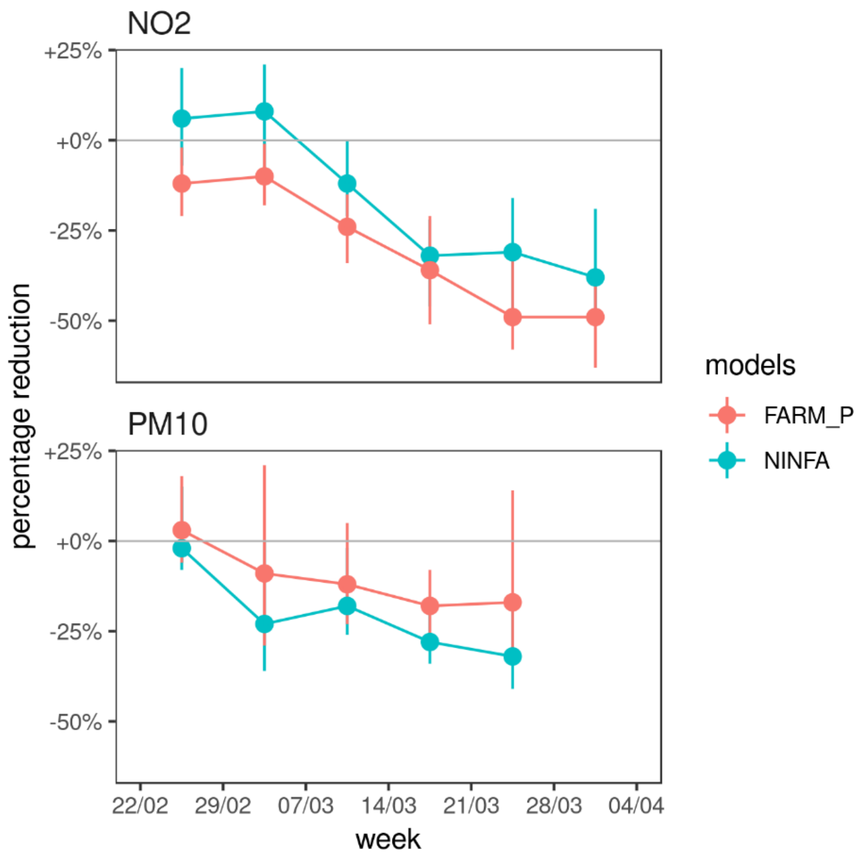

Figure 9 - Percentage reduction between real scenario and "NO-LOCKDOWN" scenario. NO2 above, PM10 below. The trends relating to the FARM_P model are shown in red, and NINFA in blue.

Scenario analysis, screening assessments

The significant emission reductions recorded in the weeks of application of the most restrictive measures to individual mobility and their effects on air quality, were compared with alternative scenarios.

The tool used is RIAT +, created with co-financing from the European Commission and further developed as part of the PREPAIR project. RIAT + has been specially calibrated, for the Po Valley, with the photochemical models NINFA by Arpae Emilia-Romagna (NINFA_ER) and FARM by Arpa Piemonte (FARM_PI). The tool allows to estimate the effects of an emission reduction scenario on the average annual background concentrations of NO2 and PM10.

In this case, five homogeneous reduction scenarios were considered over the entire Po basin applied for an entire calendar year:

1) **LDmin**, with PM and nitrogen oxide emissions reductions equal to the minimum estimated in the *lockdown* period;
2) **LDmed**, with PM and nitrogen oxide emissions reductions equal to the average ones estimated during the *lockdown* period;
3) **LDmax**, with PM and nitrogen oxide emissions reductions equal to the maximum estimated in the *lockdown period* ;
4) **LDmax+agr**, as scenario with also emission ammonia reduction from agriculture macrosector , similar to those expected for 2025 with the application of regional air plans;

5) **plan2025**, scenario expected for 2025, with the full application of current legislation , regional plans and basin agreements[2].

The LDmin, LDmed and LDmax scenarios concern emissions from road transport, airports and industrial activities only; the LD + agr scenario also concerns agriculture. Instead the plan2025 scenario concerns all anthropogenic activities.

Scenario	NOX	NH3	PM10	PM2.5	SO2	VOC
LDmin	25%	0	5%	5%	0	0
LDmed	30%	0	10%	10%	0	0
LDmax	40%	0	20%	20%	0	0
LDmax+agr	40%	22%	20%	20%	0	0
plan2025	39%	22%	38%	41%	4%	16%

Table 2 - Percentage emission reductions applied in the five scenarios

Figure 10 shows the box plots of the distributions of the percentage reductions in concentrations on the regions of the Po basin, respectively for NO2 and PM10, elaborated starting from the results produced by RIAT+with NINFA_ER and FARM_PI setup.

First of all, it is noted that the two models have a very similar behavior to each other; this confirms the robustness of the results.

The three scenarios **LDmin**, **LDmed** and **LDmax**, which assume emission reductions similar to those recorded during the *lockdown* for a whole year, in most of the territory would lead to reductions in NO2 concentrations ranging from -15% to -35% and PM10 reductions between -2% and -10%.

With the **LDmax + agr** scenario, in which ammonia emissions from the agricultural sector are also reduced, compared to the LDmax scenario, a further decrease in PM10 concentrations (about -4%) is obtained, with higher percentage reductions on the whole territory between the Piedmont plain the Emilian plain, the eastern Lombard plain and the Venetian one (from values of about -8% to values of the order of -13%).

The different spatial distribution of the percentage reduction on the concentration of PM10 is highlighted in Figure 11, where the maps obtained with the two scenarios LDmax and LDmax + agr, with the two differenf RIAT+ setup are shown. In this case there is also a slight difference in the response of the two models, with NINFA_ER attributing greater reductions in the LDmax + agr scenario, also for the Veneto plain. Finally, the **plan2025** scenario, by significantly acting with structural interventions on all anthropogenic activities (transport, industry, agriculture, heating, etc.), over the next five years, would achieve a more marked and spatially greater extended improvement in air quality, more than all the other here considered scenarios. In a large part of the Po basin, the NO2 reductions would be between -25% and -40% and those of PM10 between -8% and -20%.

2Note that even for the "plan2025" scenario the emission reductions are applied uniformly on the domain and therefore do not exactly reflect any territorial inconsistencies in the actions taken. It is therefore a screening evaluation.

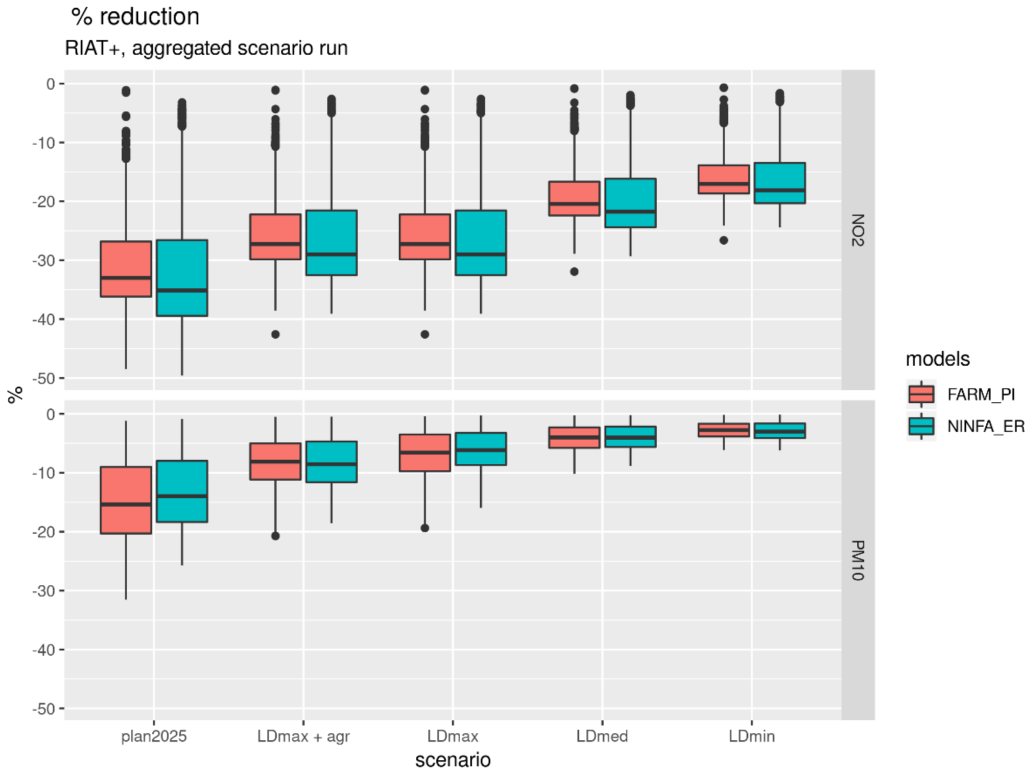

Figure 10 - Percentage reductions in the annual average concentrations of NO2 (above) and PM10 (below) in the Po valley, obtained for the five scenarios analyzed with the two different RIAT + calibrations (FARM_PI model and NINFA_ER model).

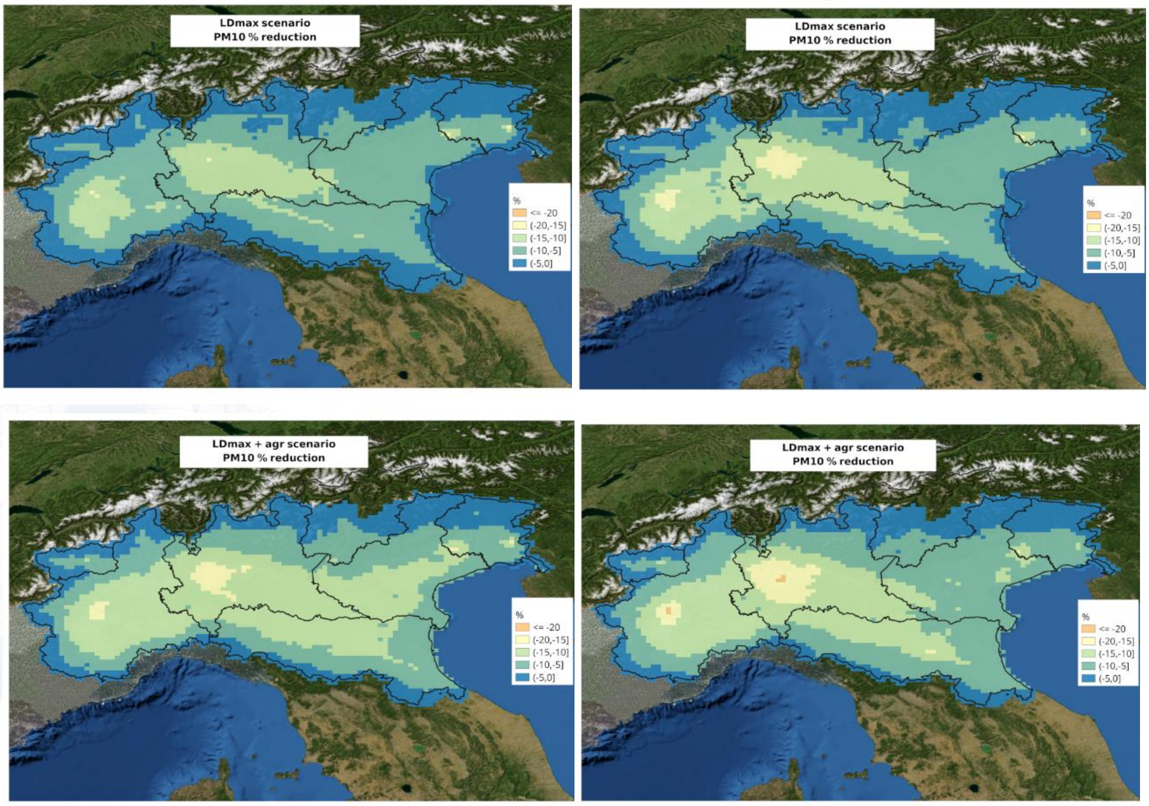

Figure 11 - Maps of the spatial distribution of the percentage reductions of the annual average concentrations of PM10 in the Po valley, obtained with the LDmax scenario (top) and with the LDmax + agr scenario (bottom) with the two different RIAT + calibrations (NINFA_ER model on the left and FARM_PI model on the right).

Conclusions

The main critical issues on the quality of the air in the Po valley concern the exceeding of the annual and daily limit value of PM10 and the annual limit value of NO2. This determines significant impacts on the health of the population. As part of the PREPAIR project, it was assessed that the full application of the measures set by the air quality plans of the regions, by the interregional and national agreements, and by the project itself, would allow compliance with the limits on a large part of the Po Valley, significantly reducing the exposure of the population to pollutants.

In order to affect the concentration of PM and NO2, the plans have set measures that act not only on the direct emissions of these pollutants, but also on the main precursors, i.e. those pollutants that determine the formation of the secondary PM. These are ammonia (NH3), volatile organic compounds (VOC) and sulfur oxides (SOx), as well as the nitrogen oxides (NOx) themselves. The emissions of these precursors are due to many human activities (traffic, agriculture, heating, industry).

The emission reductions associated with the scenario of the plans and the PREPAIR measures , which would allow to fall within the limits, are of the order of 40% for PM10 and NOX and 20% for NH_3.

The results of the analyzes on the *lockdown period* provided an opportunity to verify the validity of these assessments and compare them with the data on the reduction of emissions and concentrations in an unprecedented condition of generalized contraction of human activities. The assessments of the emission variations relating to the lockdown period can in fact be compared with the target reductions of the plans. This comparison indicates that:

- NO_X emissions had a decrease comparable to that envisaged by the plans, with a weekly maximum of the order of 40% (variations from week to week and trends are similar in the various regions). This decrease is mainly attributable to the reduction in vehicle traffic which reached 80% for light vehicles and 50 - 60% for heavy commercial vehicles.
- PM10 (primary) emissions had a maximum weekly decrease of the order of 20%, significantly lower than that envisaged by the plans (-40%), with variations from week to week and trends diversified in the various regions. The smaller decrease in PM10 emissions is mainly attributable to space heating; the differences between the regions are mainly due to the different consumption of woody biomass.
- Starting from the first week of May, at the beginning of phase 2 (DPCM April 26, 2020) there is a reversal trend for both pollutants and emissions progressively increase as activities resume.
- Ammonia emissions are not reduced, as agricultural / livestock activities, which emit more than 90% of ammonia, did not change during the *lockdown*. Small variations (approximately -1%) are due to the reduction in circulating vehicles (catalytic converters). Small variations (approximately -1%) are due to the reduction in circulating vehicles (catalytic converters).

In line with the framework of emissions, gaseous concentrations (NO2, NO, benzene) in March-May 2020 there have been very significant decreases compared to the average period 2016-2019. PM10 mass, however, shows a less reduction. with concentration values within the variability of previous years (2016-2019), highlighting a decoupling with gaseous pollutants.

These data once again highlight the complex dynamics of PM and of the relationships between emissions of precursors and transport, diffusion and physico-chemical processes that determine the formation of the secondary PM, which constitutes a significant part (of the order of 70%) of PM10 in the Po basin.

This dynamic, as we have seen, even with reduced emissions, is strongly influenced by weather conditions and can lead to episodes of exceeding of the limit values, although of much lower intensity compared to that which would occur in the usual emission conditions.

To evaluate the impact on the concentration of PM10 and NO2 NO_2 of the emission variations, two different chemical models of transport and dispersion were used which allow to estimate the percentage reductions of the real scenario compared to a hypothetical scenario in which the emissions did not change ("NO-LOCKDOWN" scenario). The results of the two models are consistent with each other and indicate that for nitrogen dioxide (NO2 NO_2) the reductions at the end of March reach median values on the Po Valley of about 35-50%, while for PM10 the reductions are smaller, more differentiated by geographical area, more variable in the various weeks, but still reach a median reduction of 15-30%. **In other words, in the absence of the *lockdown*, in the same weather conditions, the NO2 concentration was about twice and the concentration of PM would have been higher by about 1/3.**

The main hypotheses to explain the causes of the relatively less effective reduction of PM compared to NO2 are:

- the primary PM10 emissions have not been reduced sufficiently, in particular due to heating emissions;
- some precursors (mainly NH_3) did not decrease. The mixture of precursor gases could have remained such as to maintain a high secondary production potential even in the presence of varied proportions (less NOX, constant NH_3);
- the high insulation in March increased the production of secondary PM of photochemical origin.

These results seem to confirm the correctness of the strategy of the air quality plans adopted by the Regions and Autonomous Provinces of the Po Basin, as well as the interregional agreements, focused on multi-sectorial and multi-polluting large-scale interventions. In particular, the results of the study, although preliminary, confirm some key points of the planning:

A. The achievement of the European air quality objectives makes it necessary to achieve NOX emissions reductions of the order of 40% over the entire Po Valley. These variations appear to be sufficient to reduce the concentration of NO2 air and confirm the need to act on the transport sector through actions aimed at substantial reduction of traffic flows and the promotion of more sustainable way of traveling (cycling, electricity, micro-mobility, etc.).
B. The reduction of NOX emissions of the order of 40%, accompanied by a reduction of primary PM emissions of the order of 20%, may not be sufficient, in the meteorological conditions of stagnation typical of the Po Valley, to guarantee the compliance with the daily and annual limit values. Measures are therefore needed to further reduce primary PM10 emissions, particularly regarding heating. It is also necessary to act on the emissions of precursors not directly linked to the transport sector, such as ammonia from agricultural / livestock activities.

In the third part of the PREPAIR study it was planned to deepen the analyzes in order to verify and consolidate these preliminary conclusions with the aim of obtaining additional elements of knowledge necessary to set up the next phase of planning in terms of air quality.

With the contribution of the LIFE Programme of the European Union

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THE PREPAIR PROJECT

The Po Basin represents a critical area for the quality of air, as the limit values of fine powders, nitrogen oxides and ozone set by the European Union are often exceeded. The northern Italian regions re included in this area as well as the metropolitan cities of Milan, Bologna and Turin.

This area is densely populated and highly industrialized. Tonsof nitrogen oxides, powders and ammonia are emitted annually into the atmosphere from a wide variety of polluting sources, mainly related to traffic, domestic heating, industry, energy production and agriculture. Ammonia, mainly emitted by agricultural and zootechnical activities, contributes substantially to the formation of secondary powders, which constitute a very significant fraction of total powders in the atmosphere.

Because of the weather conditions and the morphological characteristics of the basin, which prevent the mixing of the atmosphere, the background concentrations of the particulate, in the winter period, are often high.

In order to improve the quality of the air in the Po Valley, since 2005 Regions have signed Program Agreements identifying coordinated and homogeneous actions to limit emissions deriving from the most emissive activities.

The PREPAIR project aims at implementing the measures foreseen by the regional plans and by the 2013 Po Basin Agreement on a wider scale, strengthening the sustainability and durability of the results: in fact, the project involves not only theregions of the Po valley and its main cities, but also Slovenia, for its territorial contiguity along the northern Adriatic basin and for its similar characteristics at an emissive and meteoclimatic level.

The project actions concern the most emissive sectors: agriculture, combustion of biomass for domestic use, transport of goods and people, energy consumption and the development of common tools for monitoring the emissions and for the assessment of air quality over the whole project area.

DURATION

From February 1st2017 to January 31 2024.

TOTAL BUDGET

17 million euros available to invest in 7 years: 10 million of which coming from the European Life Program.

COMPLEMENTARY FUNDS

PREPAIR is an integrated project: over 850 million euros coming from structural funds and from regional and national resources of all partners for complementary actions related to air quality.

PARTNERS

The project involves 17 partners and is coordinated by the Emilia-Romagna Region –General directorate for the territorial and environmental care.

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