

Supplementary material

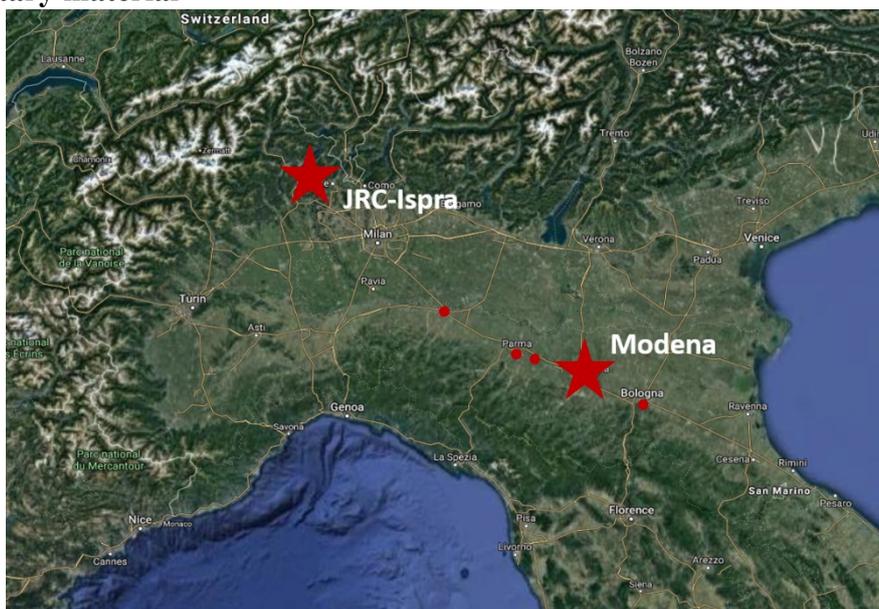


Figure S 1. The location of the JRC-Ispra (45.82 N, 8.64E) and Modena (44°37' N, 10°57' E) sites. And other cities with red dots.

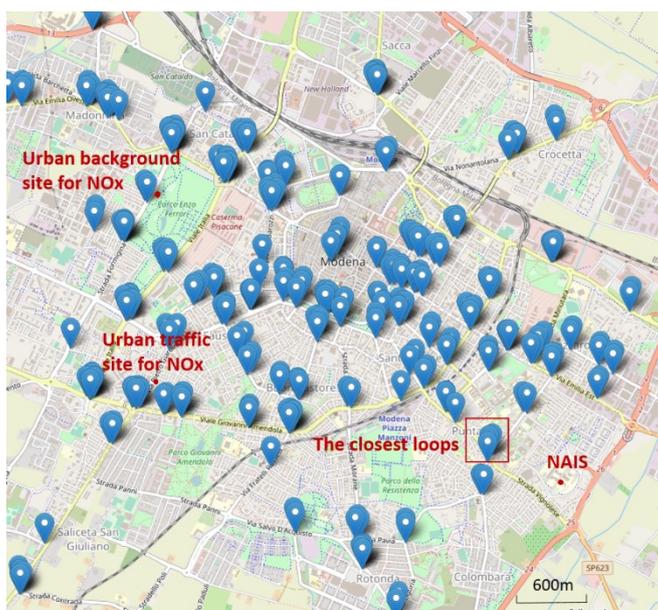


Figure S 2. The location of the NAIIS measurements and the traffic count loops (blue marker) in Modena.

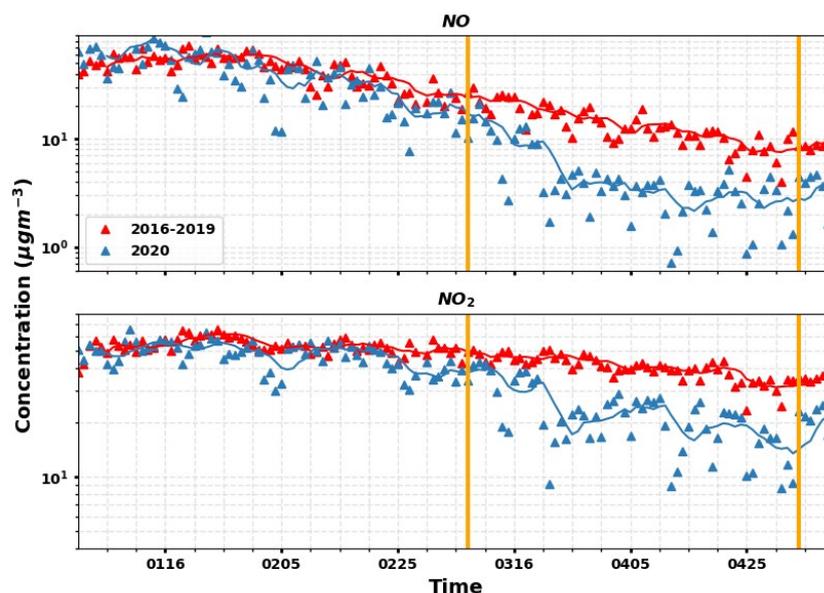


Figure S 3. Time evolution of the daily mean NO (upper panel) and NO₂ (lower panel) concentrations in the urban traffic sites during pre and lockdown period (8 Mar – 4 May) in 2016-2019 (in red) and 2020 (in blue).

Table S 1. The statistical difference between gas/particle concentrations in 2020 and 2016-2019

	t-statistic				P-value			
	Urban background	Urban traffic	Fig 5a	Fig 5b	Urban background	Urban traffic	Fig 5a	Fig 5b
NO	7.8	9.9			3.6×10^{-12}	3.6×10^{-17}		
NO ₂	8.2	12.4			4.0×10^{-13}	4.8×10^{-23}		
PM _{2.5}	0.1	0.7			0.9	0.5		
PM ₁₀	0.08	0.7			0.9	0.5		
O ₃	3.9				1.5×10^{-4}			
C ₆ H ₆		6.3				6.7×10^{-9}		
C ₇ H ₈		8.9				1.1×10^{-14}		
10-25nm			8.1	12.9			3.7×10^{-14}	1.6×10^{-22}
25-50nm			6.3	11.3			1.8×10^{-9}	2.8×10^{-19}
50-100nm			0.2	0.1			8.6×10^{-1}	0.89
100-800nm			1.6	2.11			0.12	0.04

Table S 2. The statistical difference in particle concentration between NPF and non-NPF days at the Modena and Ispra stations

	Size range	t-statistic	P-value
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Ispra station	10-25nm	7.5	4.9×10^{-10}
	25-50nm	4.9	7.1×10^{-6}
	50-100nm	1.5	0.11
	100-800nm	3.8	2×10^{-4}
Modena station	2-3nm	4.3	1.2×10^{-4}
	3-10nm	4.7	3.9×10^{-5}
	10-25nm	3	4.7×10^{-3}
	25-42nm	0.8	4.6×10^{-1}

Table S 3. The statistical difference between lockdown and after lockdown for the growth rate in the Modena station

	t-statistic	P-value
<3 nm	0.9	0.3
3-7 nm	0.04	0.9
7-20 nm	0.1	0.9

Table S 4. The statistical difference between 2016-2019 and 2020 for the growth rate in the Ispra station

	t-statistic	P-value
Pre lockdown	1.2	0.2
Lockdown	2.6	0.01
After lockdown	0.7	0.49

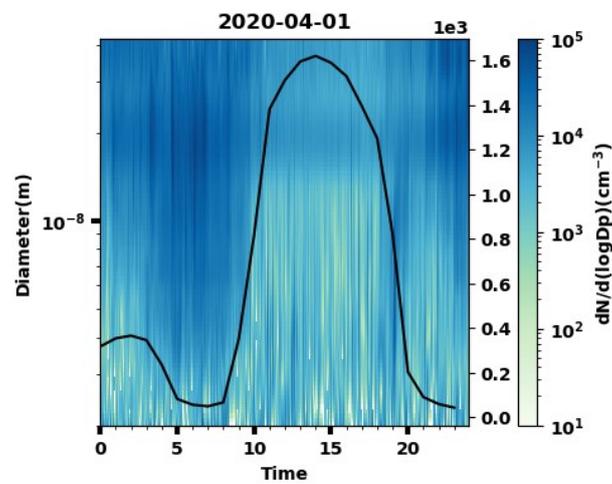


Figure S 4. The particle size distribution and boundary layer height in 01.04.2020.

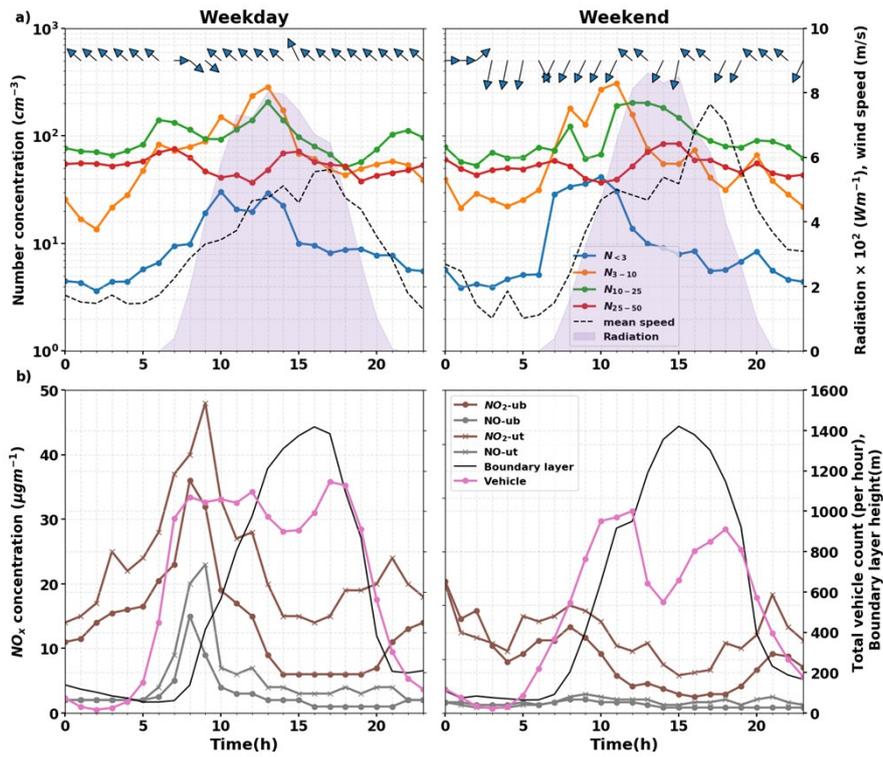
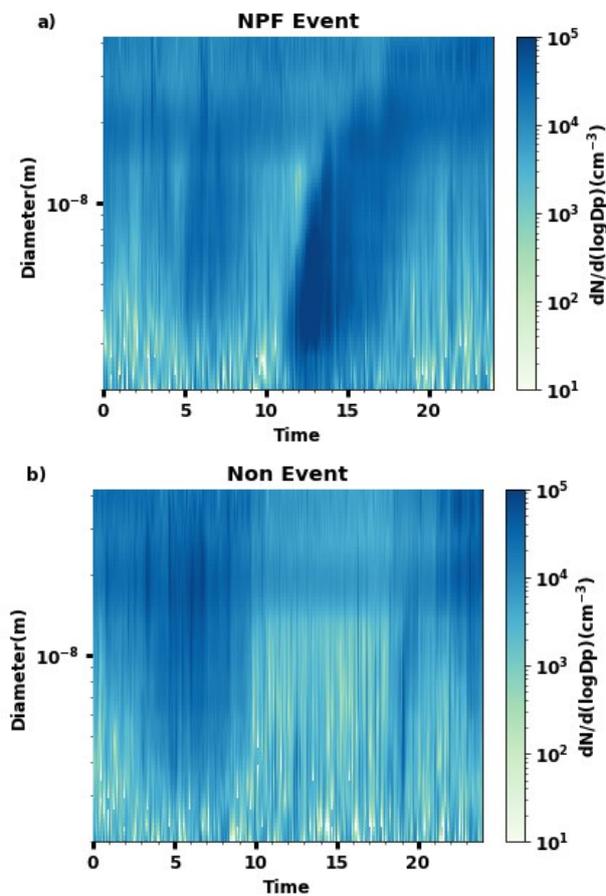


Figure S 5. a) Median diurnal variations after the lockdown period for the particles <50 nm, solar radiation (shaded area), wind speed (black dash line) and direction (blue arrow) in Modena. b) NO, NO₂ concentration from urban background (circle) and traffic (x) sites, total vehicle count (from the closest sensor) and boundary layer height.



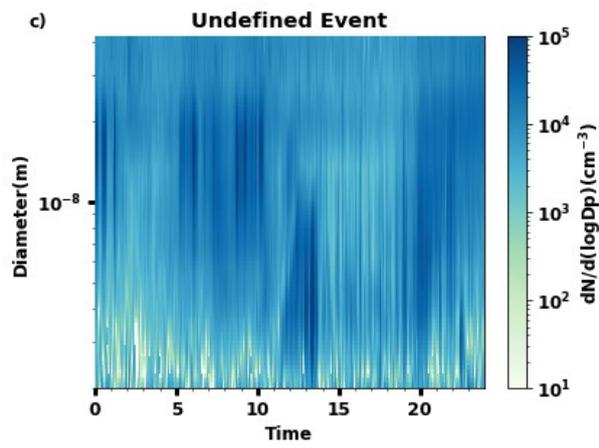


Figure S 6. Examples of the three different categories of new particle formation (NPF): NPF event (upper-left), non-event (upper-right), and an undefined day (bottom) at the Modena station.