IMPROVING AIR QUALITY TOGETHER
LIFE IP PrepAIR: project's achievements and main results

31st May 2022
Emilia-Romagna Region
Delegation to the EU

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Air quality assessment and impact of Covid-19 lockdown on air quality in Slovenia

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Air quality monitoring

- Pollutants monitored: PM_{10}, $PM_{2,5}$, NO_x, O_3, BTX, SO_2, CO, chemical composition of PM_{10} and $PM_{2,5}$
- Recently introduced parameters: BC, particle number concentration
- Configuration of monitoring station depends on its type

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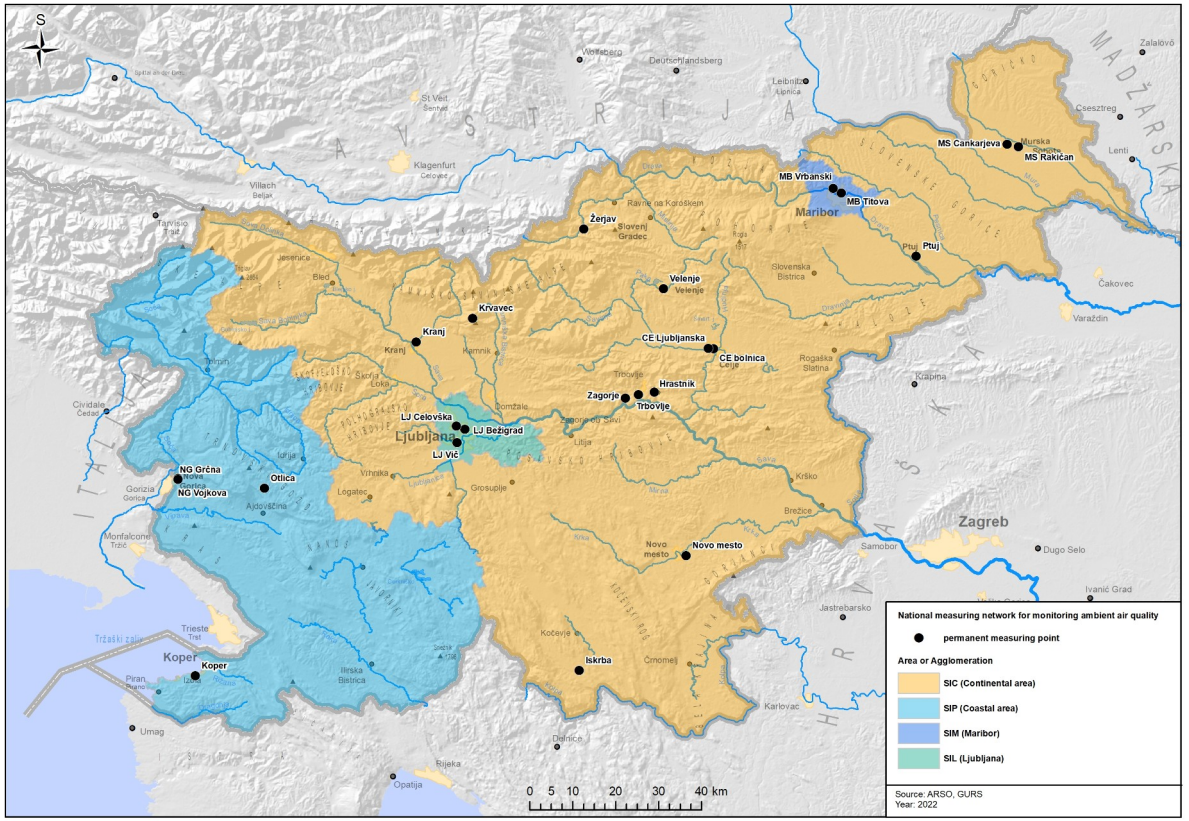
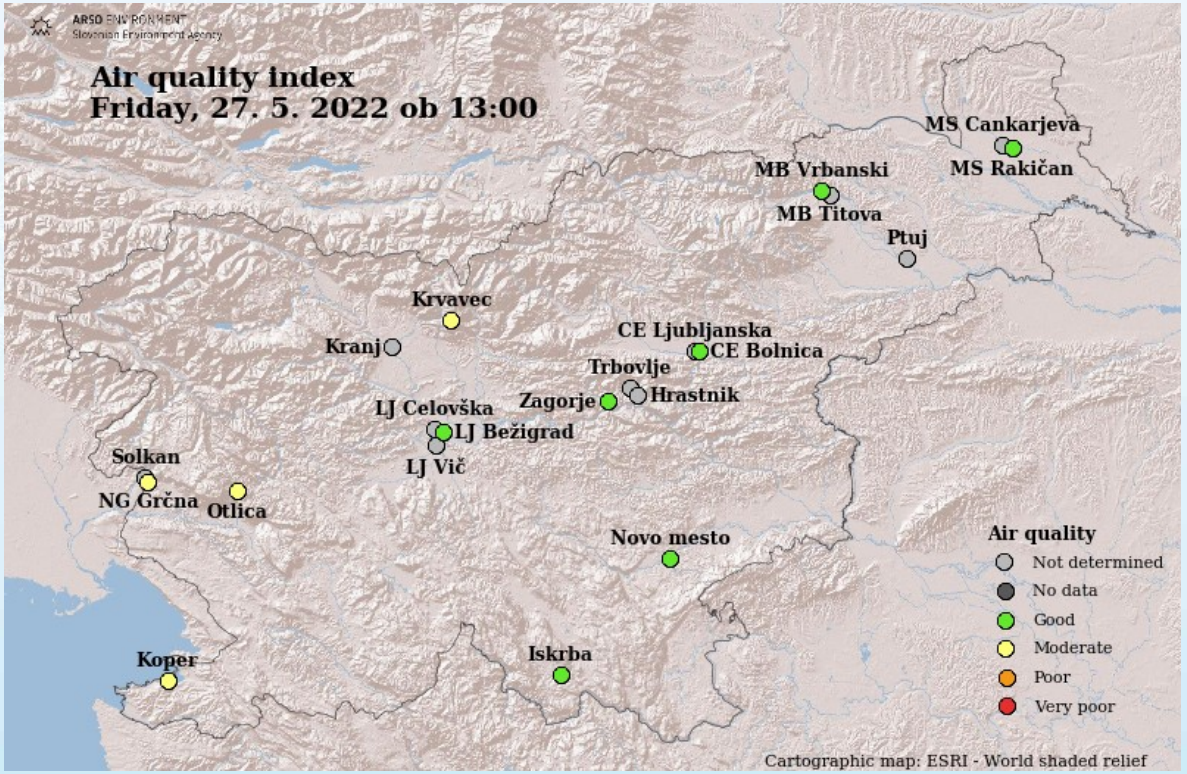
Air quality network



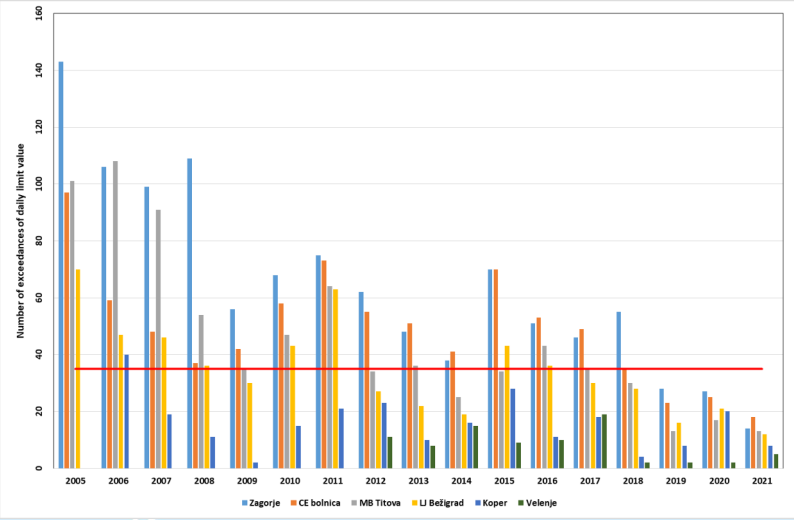
Real-time air quality information

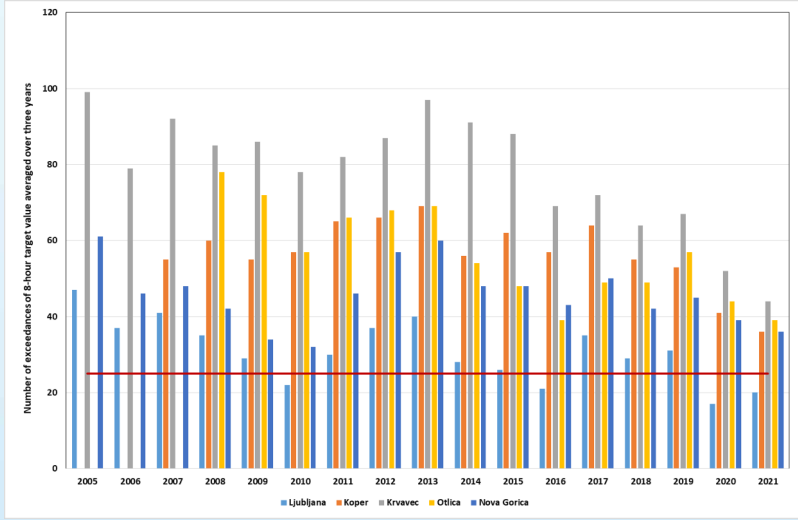
- Warning – exceedance of information or alert threshold
- Presentation of air quality index



Air quality in Slovenia

- The main air quality problems in Slovenia are associated with elevated PM_{10} and O_3 levels
- Meteorological parameters have significant influence on yearly variations
- Levels of all air pollutants show decreasing trends





Air quality modelling

- Regional scale air quality modelling system: ALADIN/SI-CAMx with 4.4 km resolution
- Data fusion techniques: best possible spatial AQ assessment based on model results and measurements (1 km)
- Local scale GRAMM/GRAL model (industrial sources, urban AQ)
- SHEPRA Tool and RIAT+ Integrated assessment model
- Air quality models are applied for:
  - Forecasting of PM_{10} in winter and O_3 in summer
  - Air quality spatial presentation
  - High pollution episode studies

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NO_2 (Yearly average for 2020)

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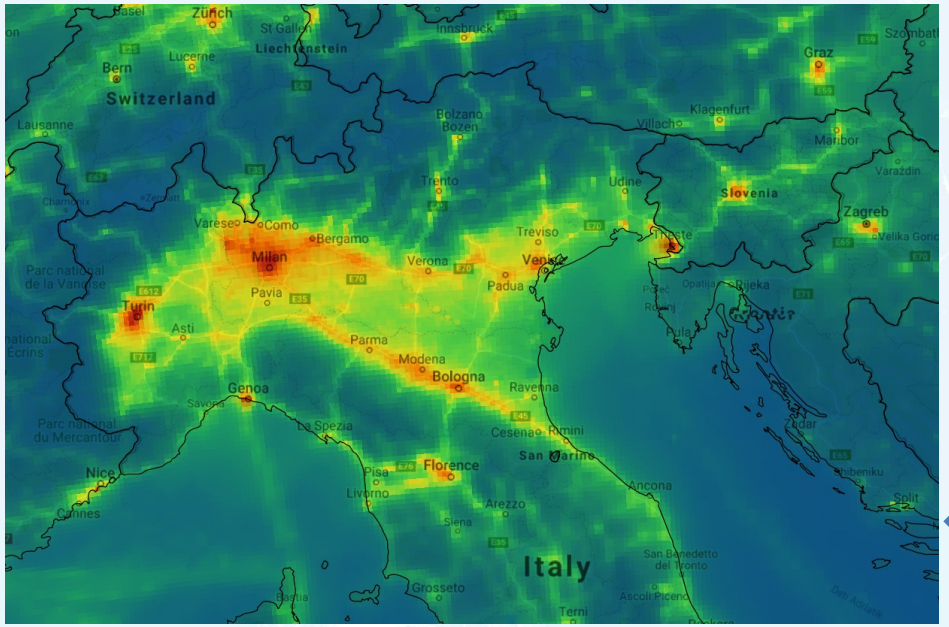
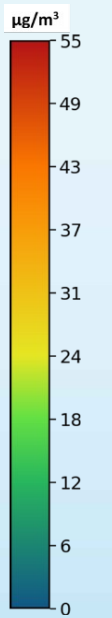
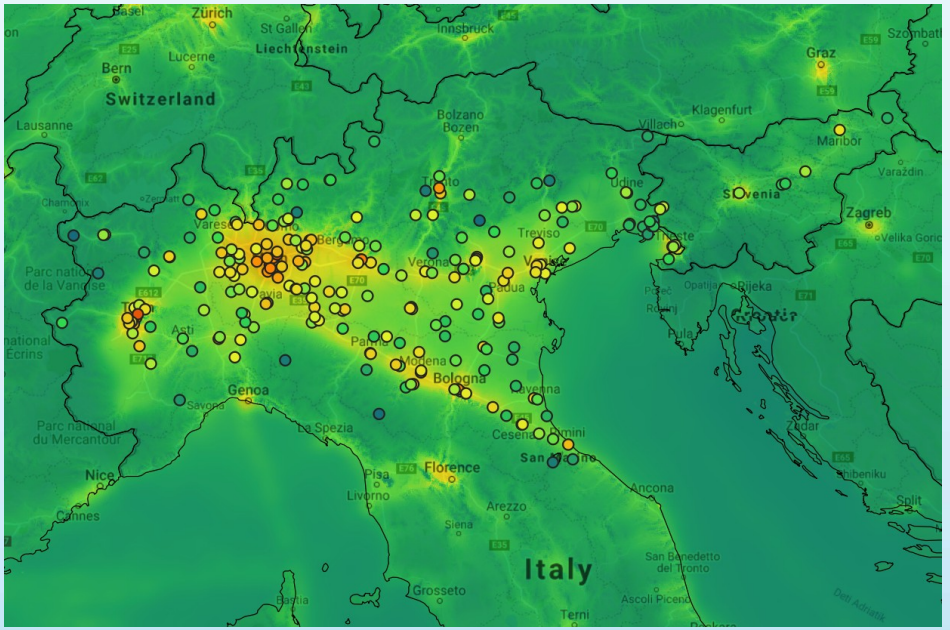


CAMx model with 4,4 km resolution



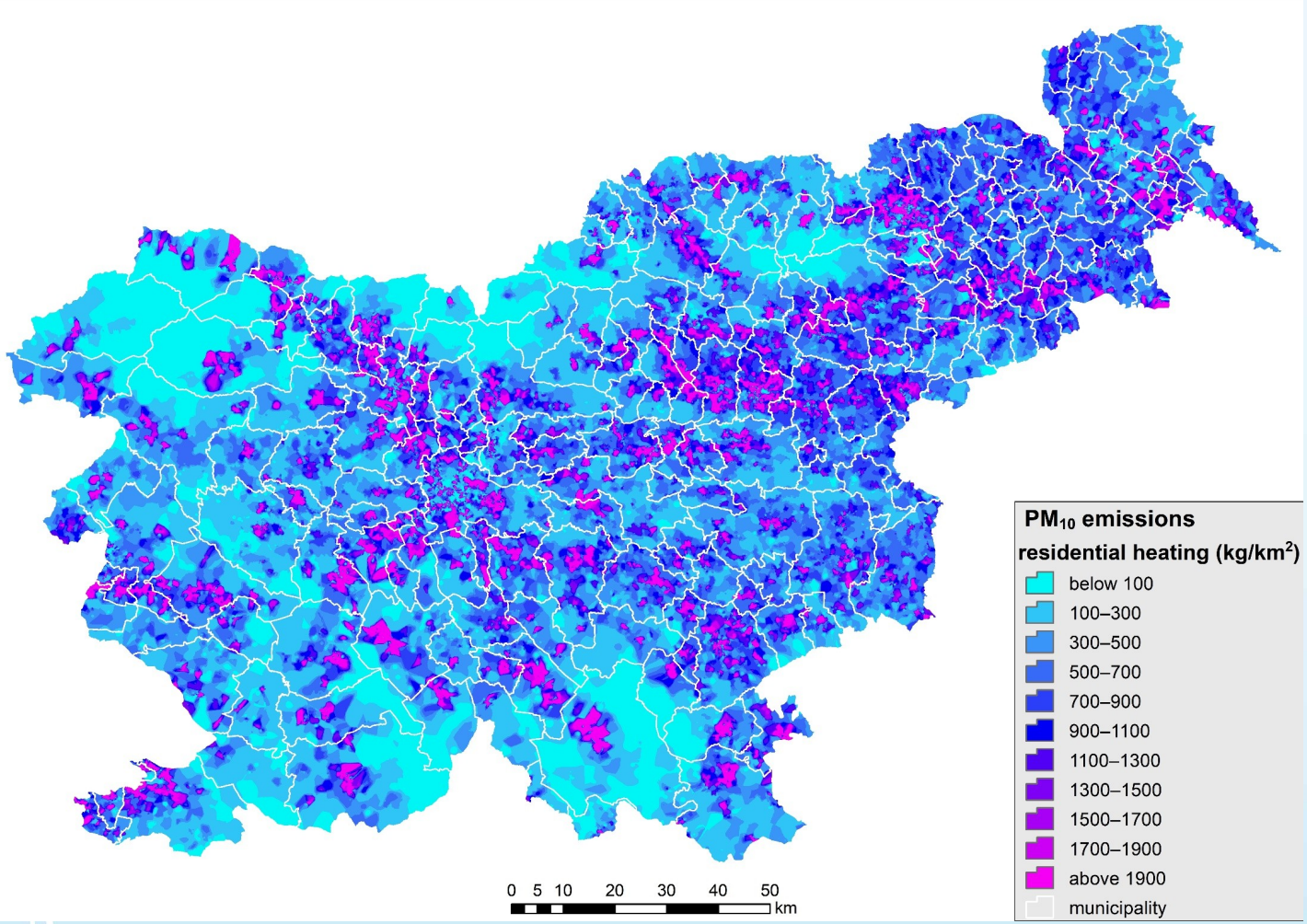
1.) Improving resolution to 1 km
2.) Balancing with measurements



Emission database

- Detailed high resolution emission data for CO, NH_4, NO_2, NMVOC, PM_{10}, $PM_{2,5}$, SO_2
- Bottom up approach combined with top down
- Spatial resolution: cell size resolution - 12 city municipalities 12.5 meters, rest of Slovenia 25 m
- Emission sectors: agriculture, domestic heating, industry, traffic
- Last available for 2018, to be updated for 2020

PM_{10} emission – domestig heating



Impact of COVID-19 lockdown on air quality in Slovenia

- The lockdown measures varied across European countries, from milder (e.g. in Sweden) to strictly enforced (e.g. in Spain and Italy).
- Time periods analysed:
  - Strict lockdown in **Spring**: March 15th – May 15th, 2020

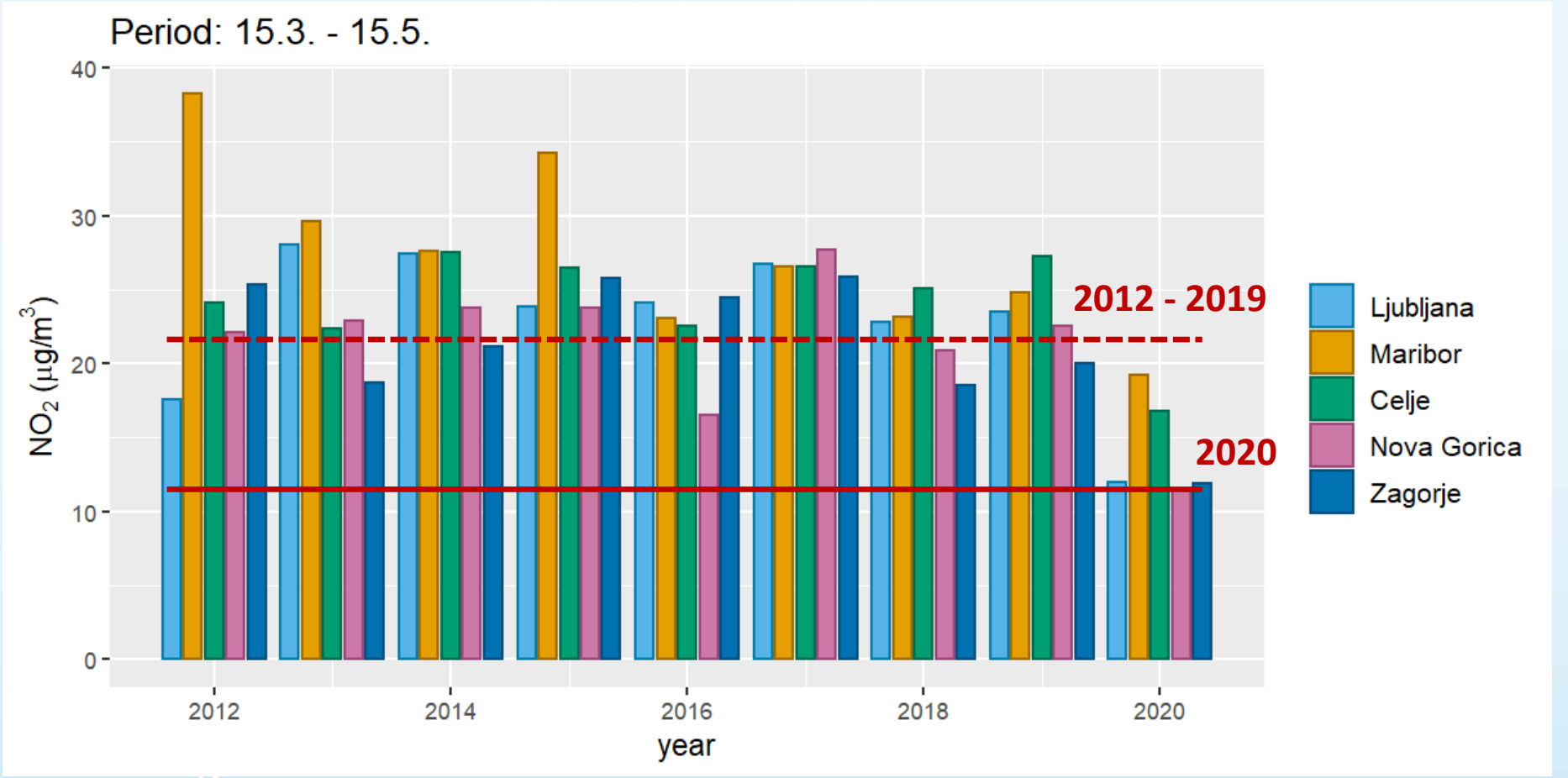
  Significantly drier, only 30% - 40 % precipitation relative to previous years
  Somewhat stronger winds than in past
  Slighly higher temperatures close to past years average

  - Less restrictive in **Winter**: November 1st – December 31st, 2020

  November warmer with more sunny days than usual
  December warmer with more precipitation than usual

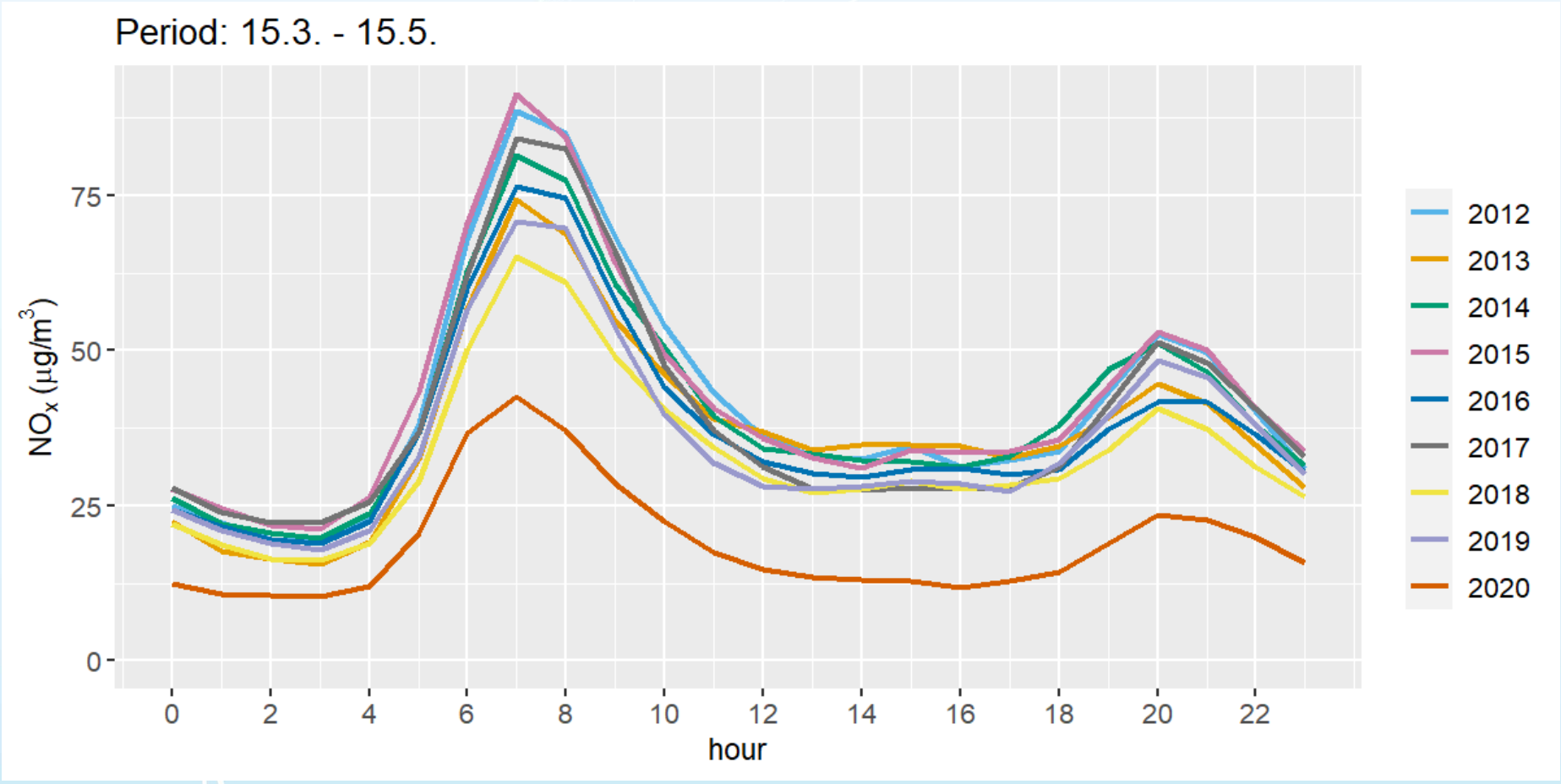
Impact on NO_2

Spring lockdown 2020: 40 % less than in 2019
42 % less than in 2012 -2019



Impact on NO_x

Spring lockdown 2020



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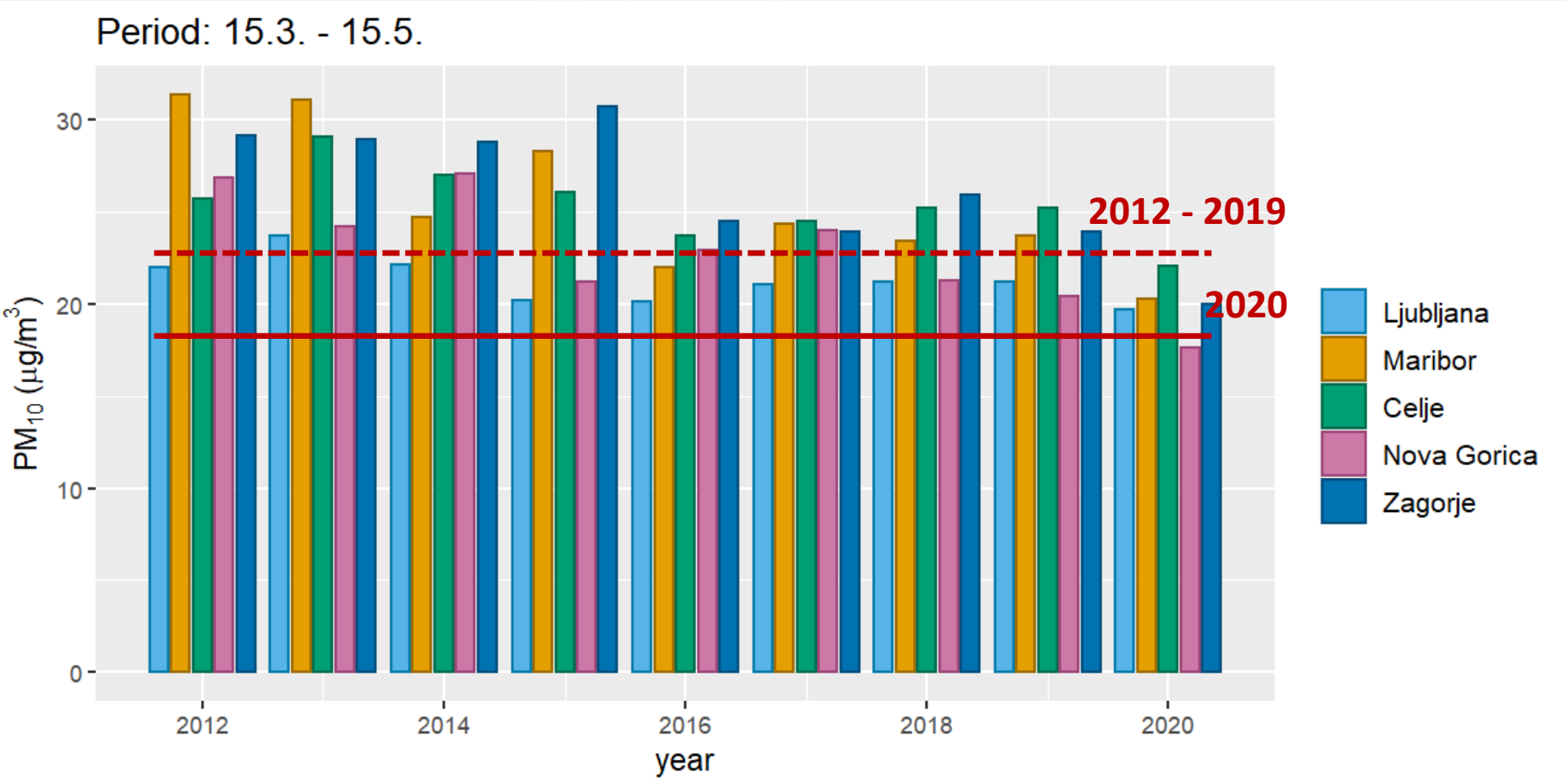
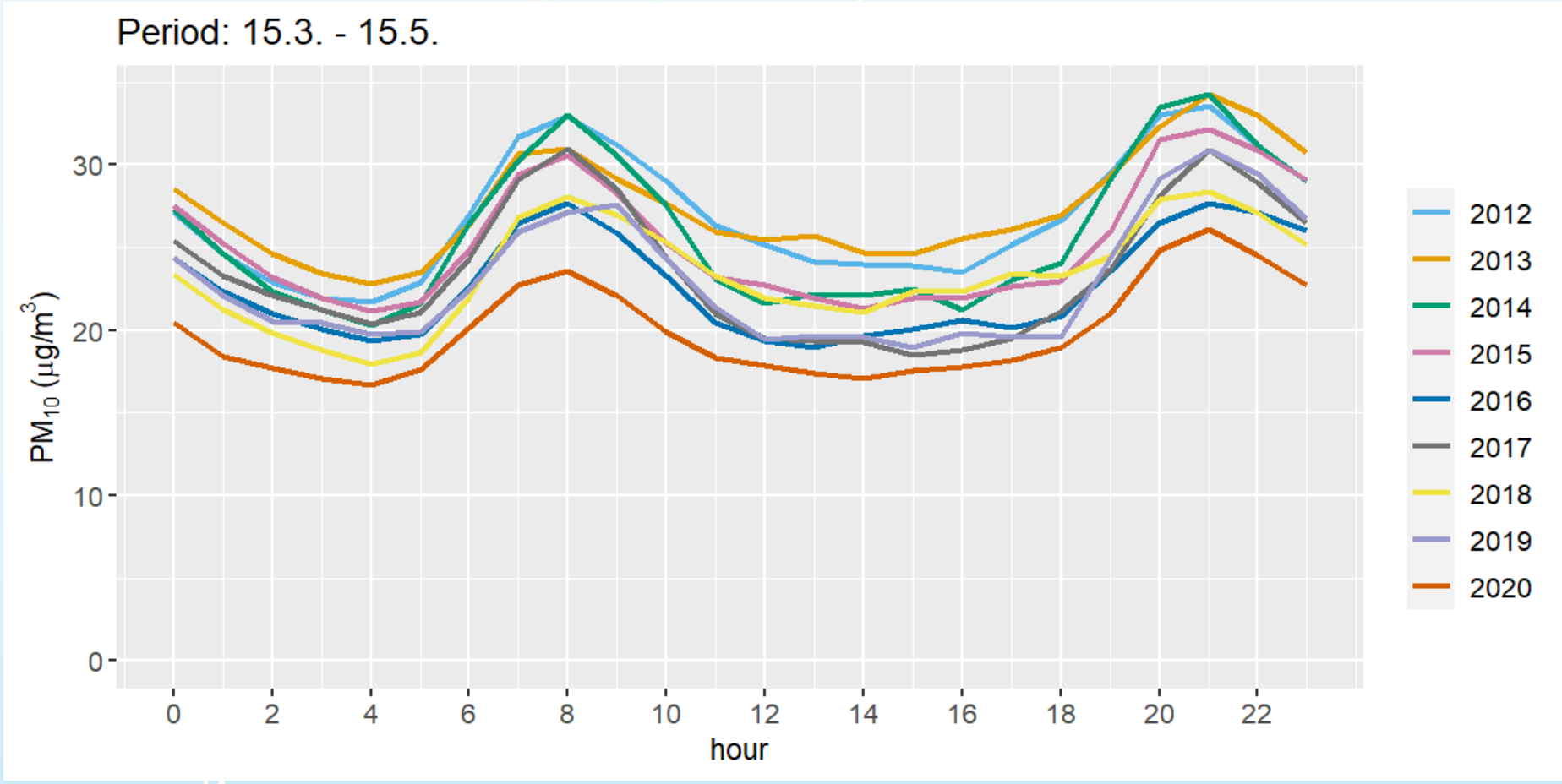
Impact on PM_{10}

Spring lockdown 2020: 13 % less than in 2019
20 % less than in 2012 -2019



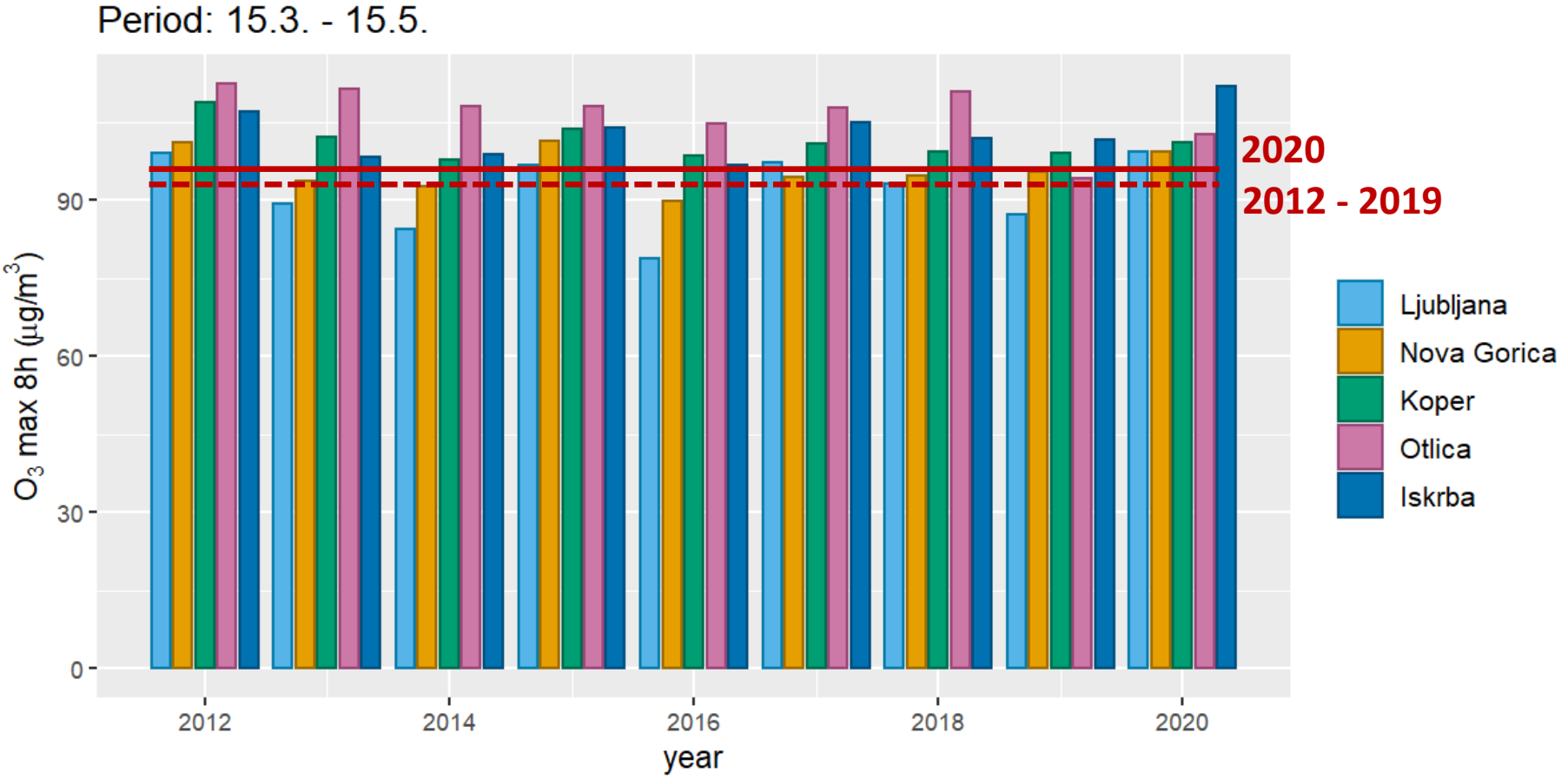
Impact on PM_{10}

Spring lockdown 2020: 13 % less than in 2019
20 % less than in 2012 -2019



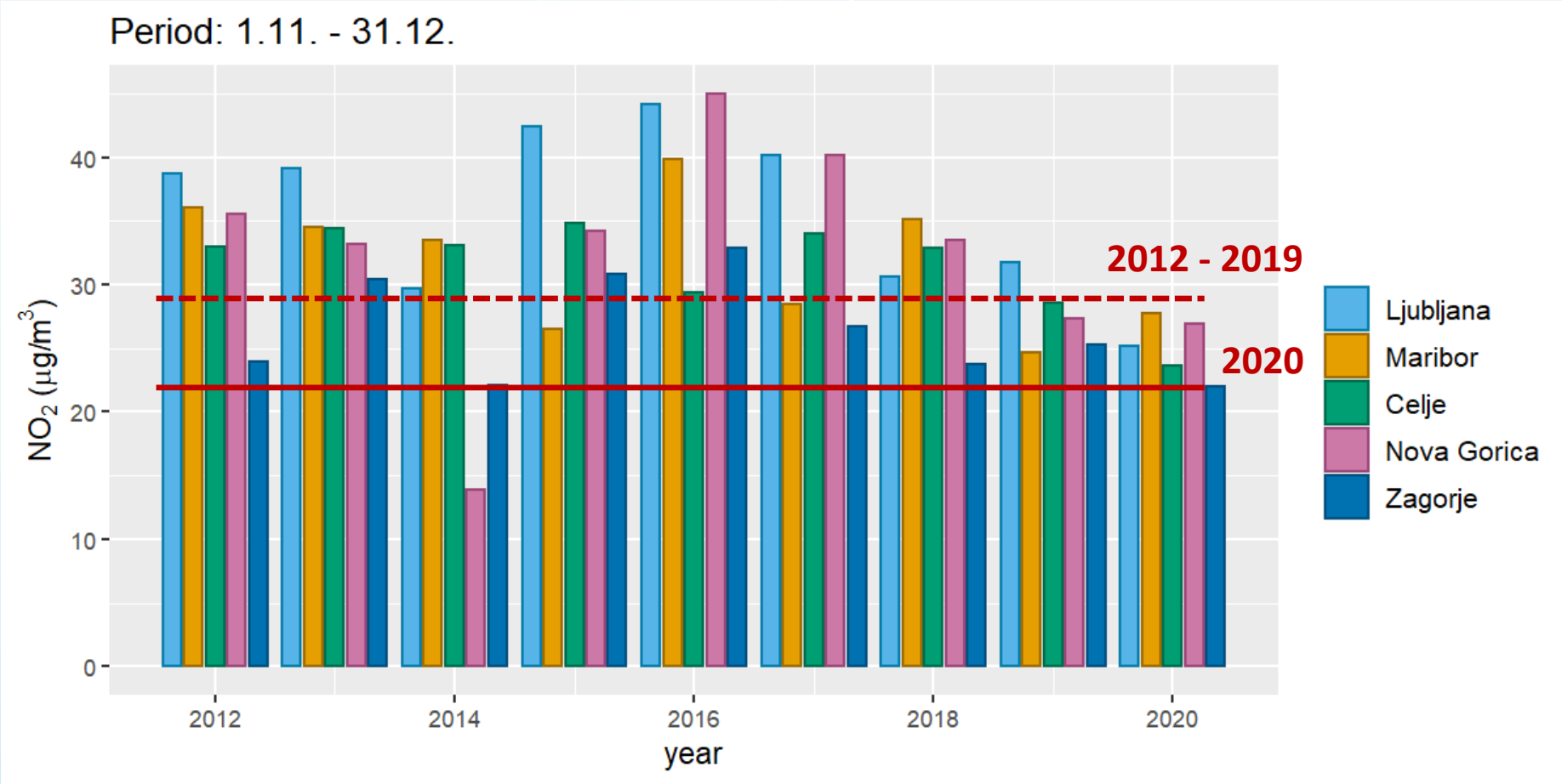
Impact on O_3

Spring lockdown 2020: no significant effect in general
somewhat higher on rural site (warm & sunny April)



Impact on NO_2

November&December 2020: 9 % less than in 2019, not consistent
22 % less than in 2012 -2019, not consistent



Thank you!

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