

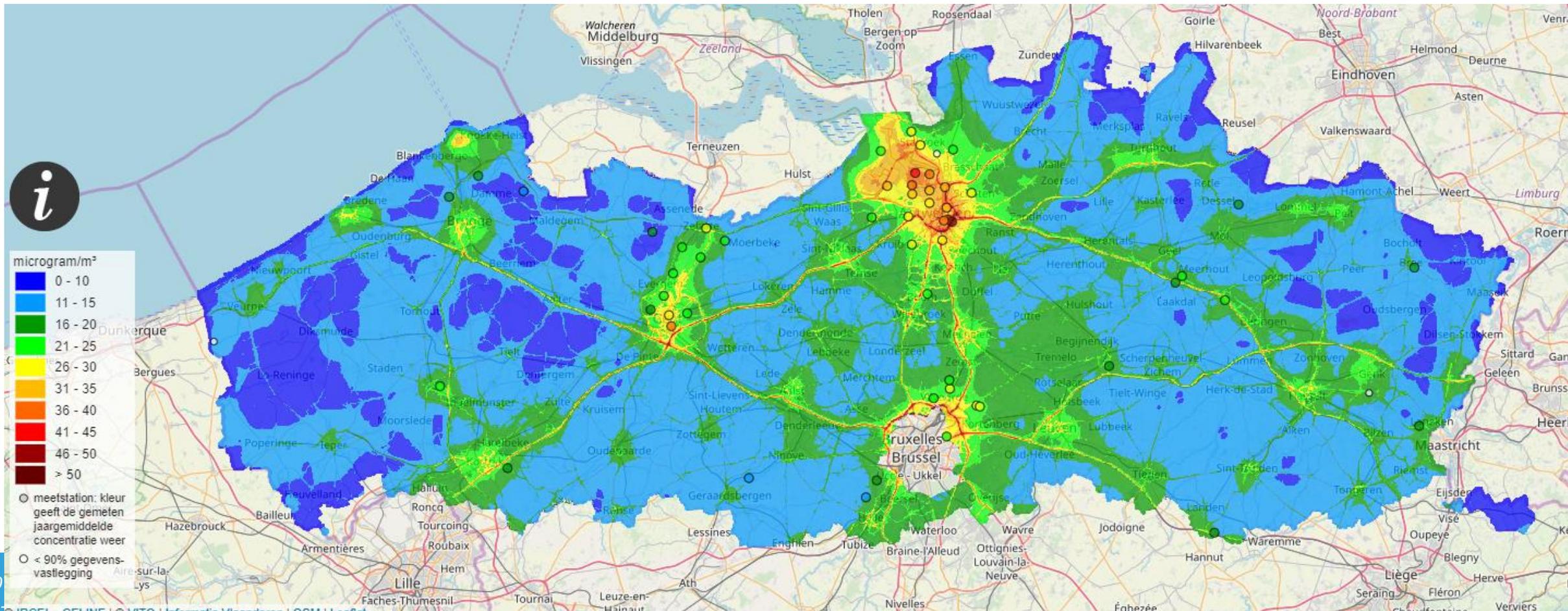
WHEN A JUDGE CONVICTS YOU TO MODEL 2030 AIR QUALITY MAPS UP TO STREET CANYON LEVEL

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- In March 2017, Greenpeace filed a lawsuit against Flemish government
- The accusation:
 - NO₂ EU limit values still exceeded in Flanders in 2016
 - Questions about the representativeness of monitoring stations
 - Urgent need to tackle air pollution on the shortest possible term

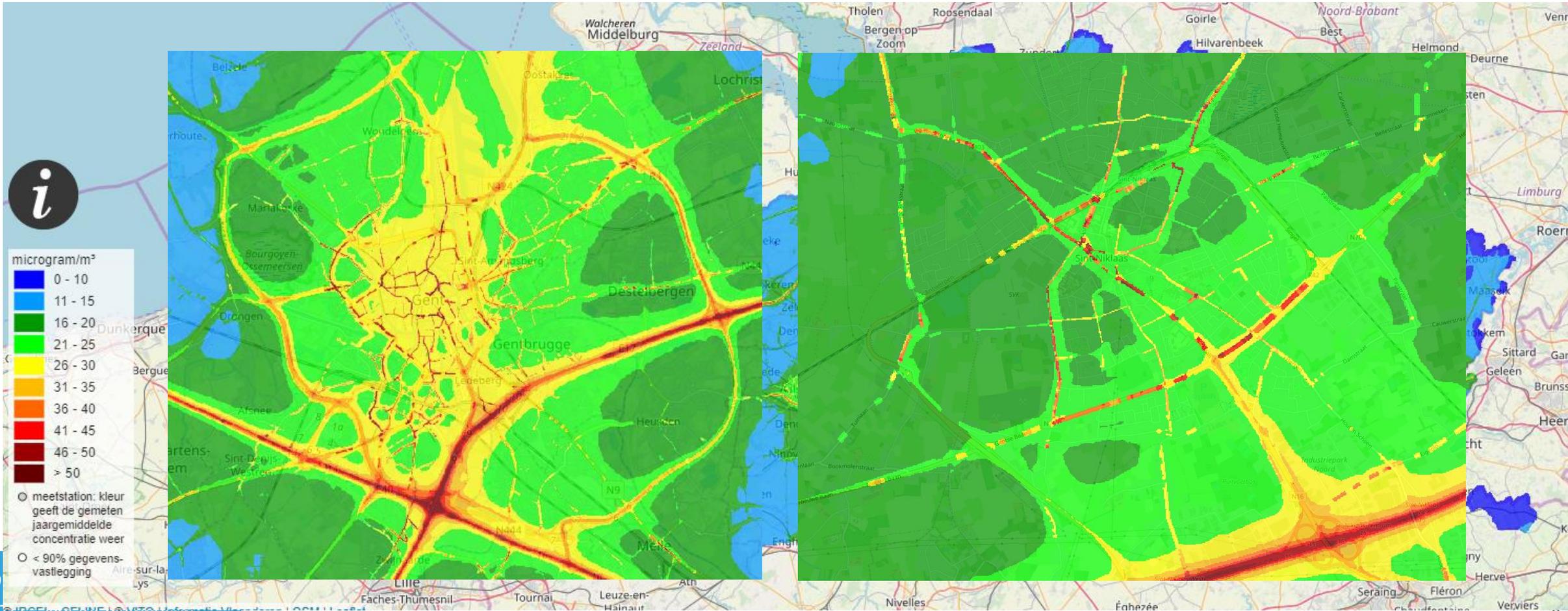
ATMO-STREET MAP

- January 2018, ATMO-Street officially adopted as AQ map of Flanders



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COURT DECISION

- October 10, 2018, decision of the Belgian court was published
https://www.rechtbanken-tribunaux.be/sites/default/files/public/content/download/files/greenpeace_vlaamsgewest101018.pdf (in Dutch only)
- Court motivation:
 - *The **Air Quality Directive stipulates that the measurement method must in principle be fixed measurements, but that it is not necessary to limit this: the **fixed measurements can be supplemented with modeling techniques and / or indicative measurements to provide adequate information about the spatial distribution of the air quality.*****

MOTIVATION: EXTRACTS FROM THE COURT DECISION

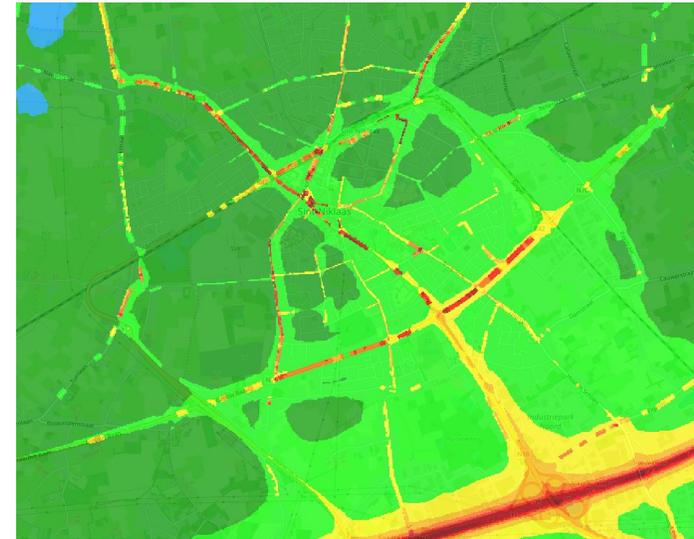
- *In the light of the objectives of the Air Quality Directive it is **self-evident** that if data is collected via other (reliable and within the requirements of the Air Quality Directive) techniques than fixed measurements, this data **must be included** in the design of a policy, the implementation of the Air Quality Directive and for assessing air quality levels.*
- *If information from indicative measurements and modeling is available, it must also be used. It would **go against** the intention of the Air Quality Directive and the **general duty of the government, to not make use of relevant** - authorized and regulated - **information** that gives additional understanding of the air quality situation.*

MOTIVATION: EXTRACTS FROM THE COURT DECISION

- *The **information obtained by the modeling techniques** and indicative measurements **must** therefore **be taken into account in the assessment regarding the exceedances of the limit values**. If these two methods show that there are exceedances that meet the criteria of point B of Annex III (in particular: representativeness and a non-negligible exposure of the population to pollution), then it may be decided that the Air Quality Directive was not respected.*
- *Otherwise assessments would have the **strange consequence** that there is no problem when the fixed monitoring network would not detect a problem, while on the basis of available information from modeling and / or indicative measurements it is known that there are limit value exceedances that have an impact on public health.*

THE COURT RULING: FLANDERS SHALL...

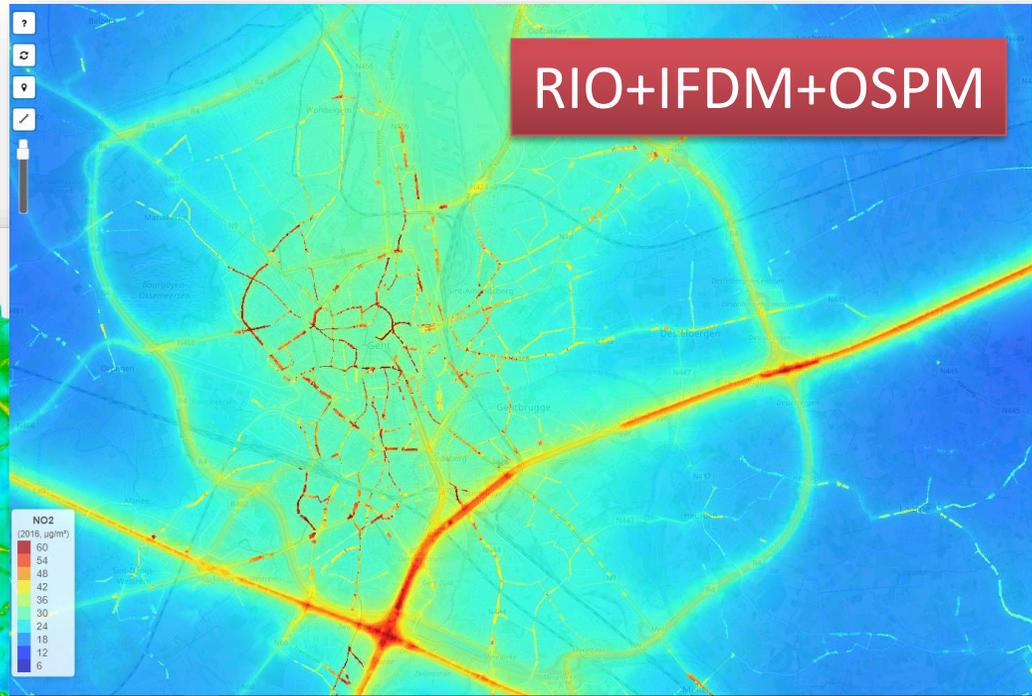
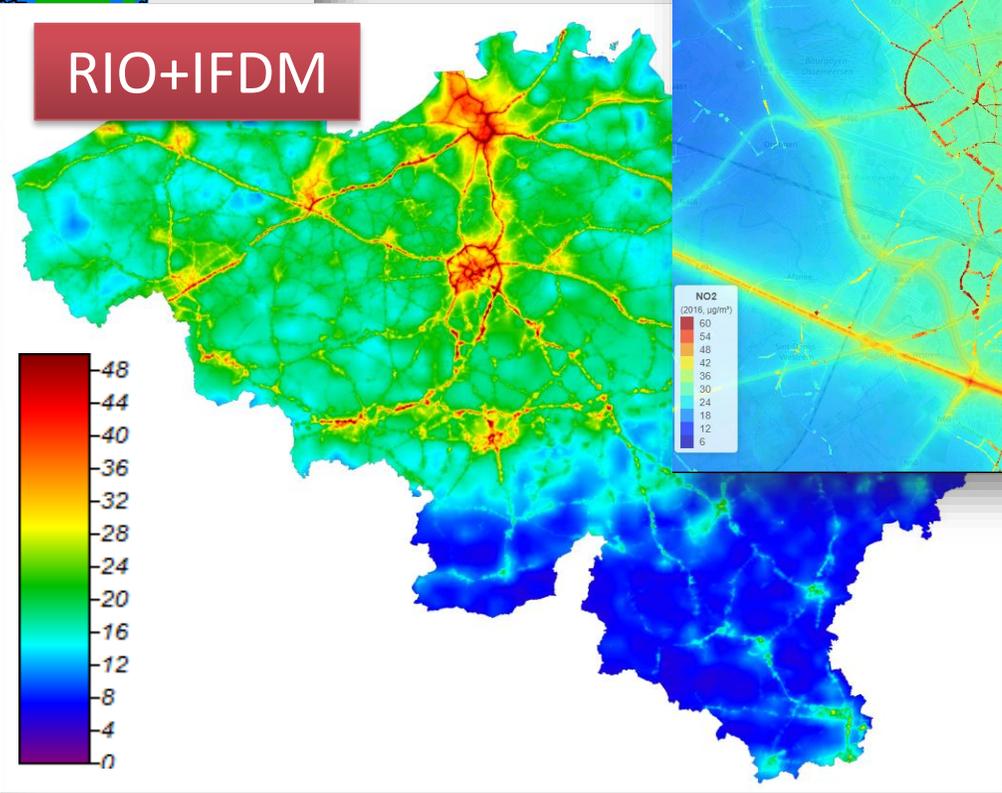
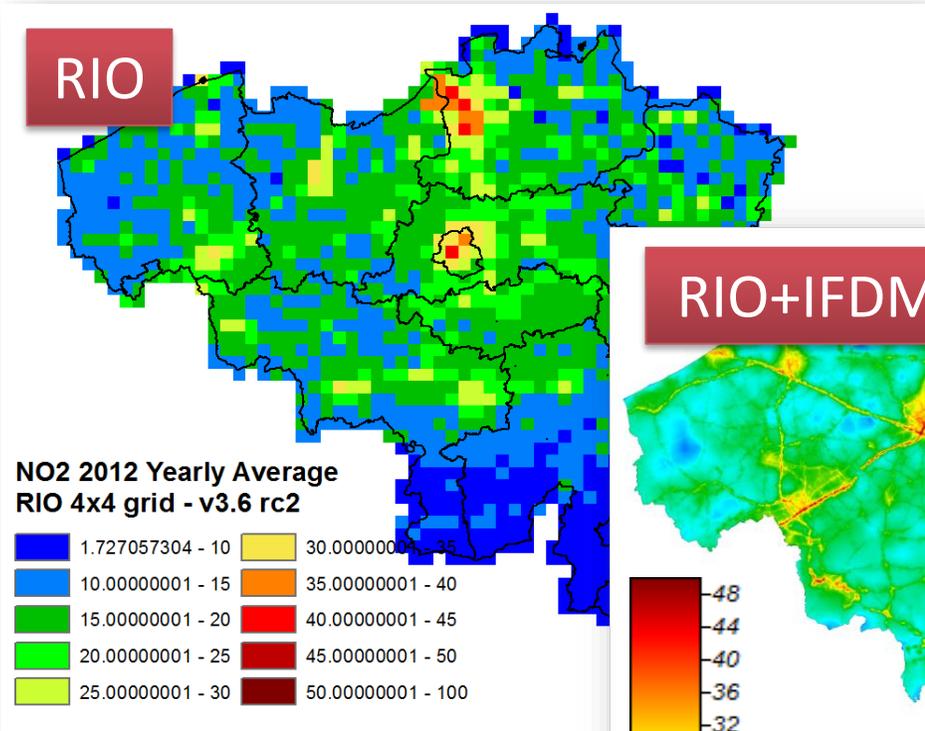
- **Report model results** (& indicative measurements) to the European Commission via e-Reporting
- Assess limit value **exceedances base on model results** (& indicative measurements)
 - Based on fixed measurements: 1 zone in exceedance
 - Based on modelling: all zones in exceedance
- Design an **air quality plan** for all zones → investigated how EU limit values can be attained as soon as possible



TWO DIFFERENT PERSPECTIVES TO LOOK AT THIS COURT RULING

1. *“The model is creating (a lot of) extra exceedances. This gives us a lot of extra work. We have to take measures and make plans at locations and air quality zones which were not flagged before.”*
2. *“Thanks to the model we now have to recognize these exceedances seriously and make sure we take proper action to improve impact on public health everywhere.”*

ATMO-STREET: FROM REGIONAL TO STREET LEVEL



AIR QUALITY PLAN FOR FLANDERS: SOME INGREDIENTS

➤ Traffic:

- Increased fleet renewal
- Road pricing
- (u)LEZ's in cities

➤ Industry:

- BAT measures
- ...

➤ Residential sector:

- Wood burning green deal

➤ Agriculture:

- NH₃ emission reductions

LONG TERM AIR QUALITY PLAN FOR FLANDERS, BELGIUM

S1: BAU_BE + BAU_EU

S2: BAU_BE + OPT_EU

S3: OPT_BE + OPT_EU

- BAU_BE → BAU
- OPT_BE → ambitious but realistic policy mix

- BAU_EU based on CLE scenario IIASA
- OPT_EU based on “OPT” scenario IIASA

HOW TO MAKE AN ATMO-STREET MAP FOR 2030?

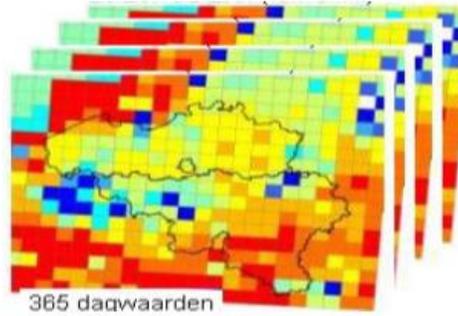
- Local emission changes (up to 2030) are rather well known
- Impact of locale sources is rather well simulated by IFDM+OSPM
- RIO does not rely on emission and can not be used for the future
- Regional CTM (AURORA) underestimates observations in 2015, so probably also in 2030

→ We need a kind of calibration methodology

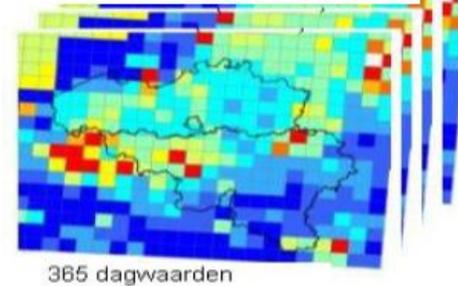
REGIONAL AQ MAP FOR 2030

- Determine “delta function” between CTM in 2015 and 2030 (grid cell by grid cell)
- Apply “delta function” on hourly RIO_2015 maps to produce hourly RIO_2030 maps

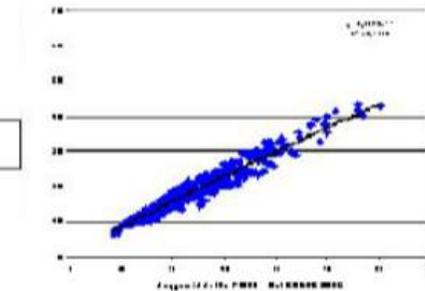
AURORA 2015



AURORA 2030 Sx



AURORA
2030Sx vs 2015



Uurlijkse RIO 2015

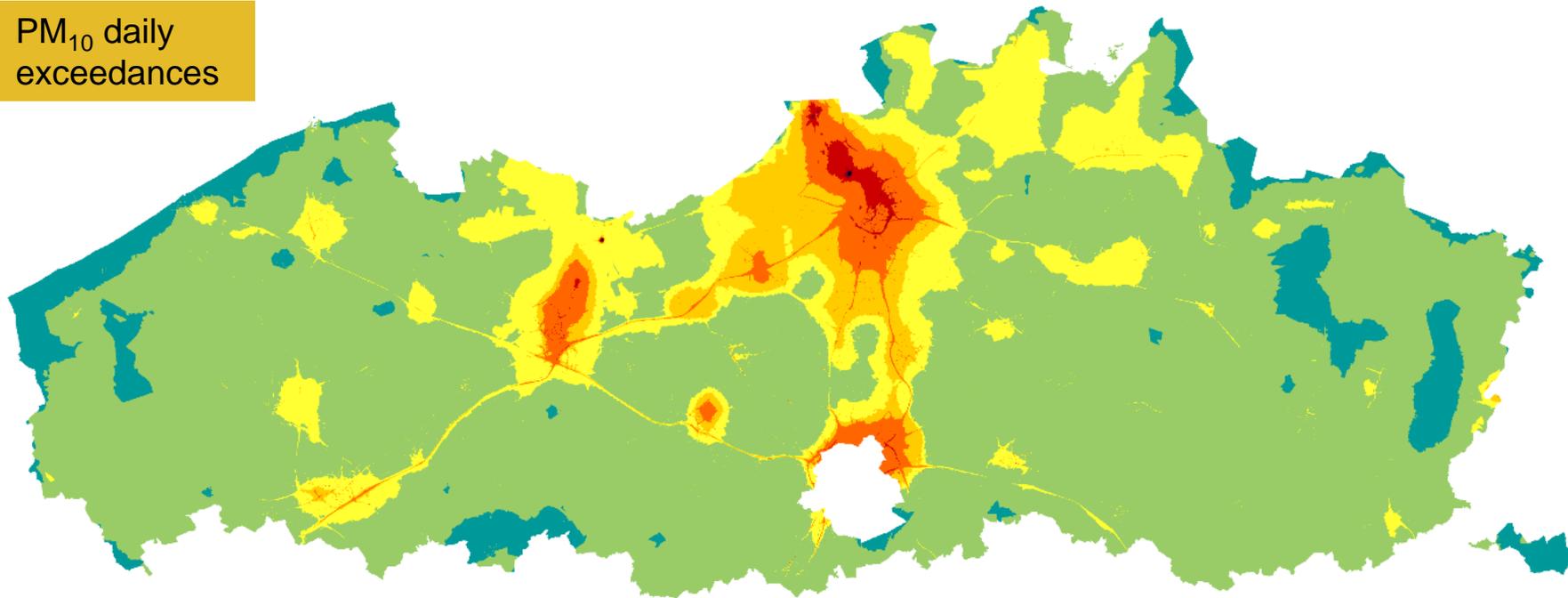


Uurlijkse RIO 2030 Sx

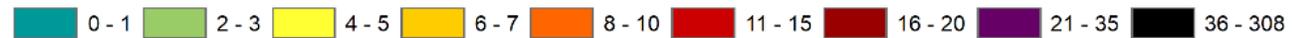


FLANDERS AIR QUALITY PLAN: 2030 RESULTS

PM₁₀ daily exceedances



PM10, # dagen daggemiddelde concentratie > 50 µg/m³ (dagen)

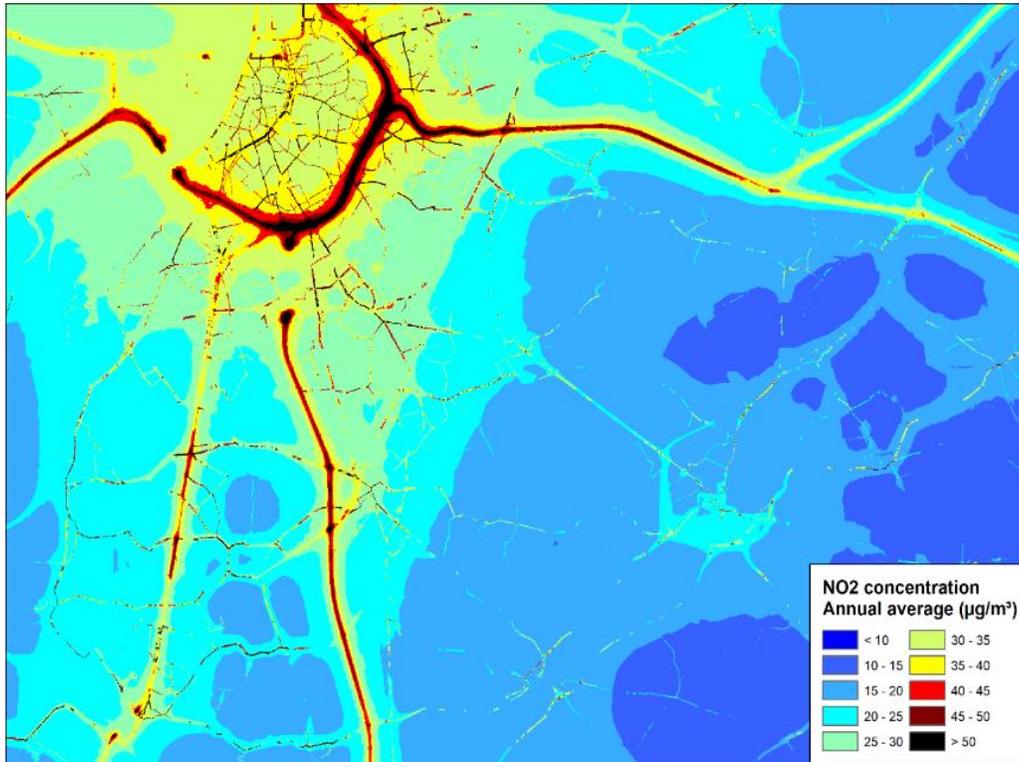


Gezondheidskundige advieswaarde: 3

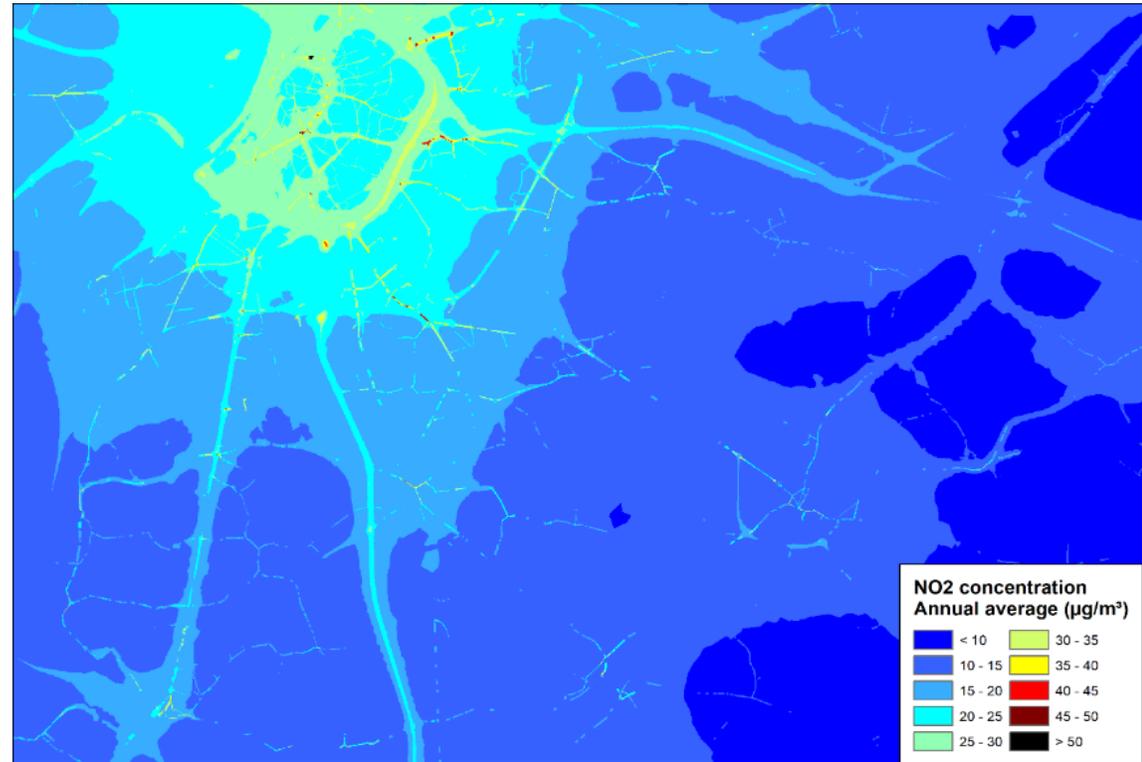
EU-grenswaarde: 35

EVOLUTION OF THE NO2 EXCEEDANCES (2015 VS 2030)

NO2 2015



NO2 2030



LIMITATIONS & UNCERTAINTIES

- Uncertainties in the policy implementation:
 - how many (u)LEZ's will be active in 2030?
- Uncertainties in activity data and emissions
 - what will be the traffic volumes in our cities?
- Meteorology
 - can we use one year of meteo?
- What is the impact of a CTM calibration?
 - How to correct for biases in CTM's?
- ...

IMPLICATIONS FOR THE MODELLING COMMUNITY

- By this court ruling modelling applications in BE obtained a formal status, comparable to fixed monitoring stations
- The modelling community should be happy
.... but are we ready for that?
 - We don't have a CEN standard for the Modelling Quality Objective
 - We don't have a clear definition of a model's fitness-for-purpose
 - ...
- So: let's make sure we have this framework in place as soon as possible! → FAIRMODE



QUESTIONS?

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