

LIFE CITYTRAQ

Breakout session

From evidence to policy action: Building robust, data-driven air-quality plans



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Agenda



- From Data to Action: Developing an Air Quality Action Plan for Bruges (Ellen Formesyn)
- Limiting wood burning in the Netherlands (Peter van Breugel)
- Air Quality in Utrecht (Michiel Kleinnijenhuis)



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WORKFLOW FOR AIR QUALITY ACTION PLANNING IN BRUGES

Ellen Formesyn



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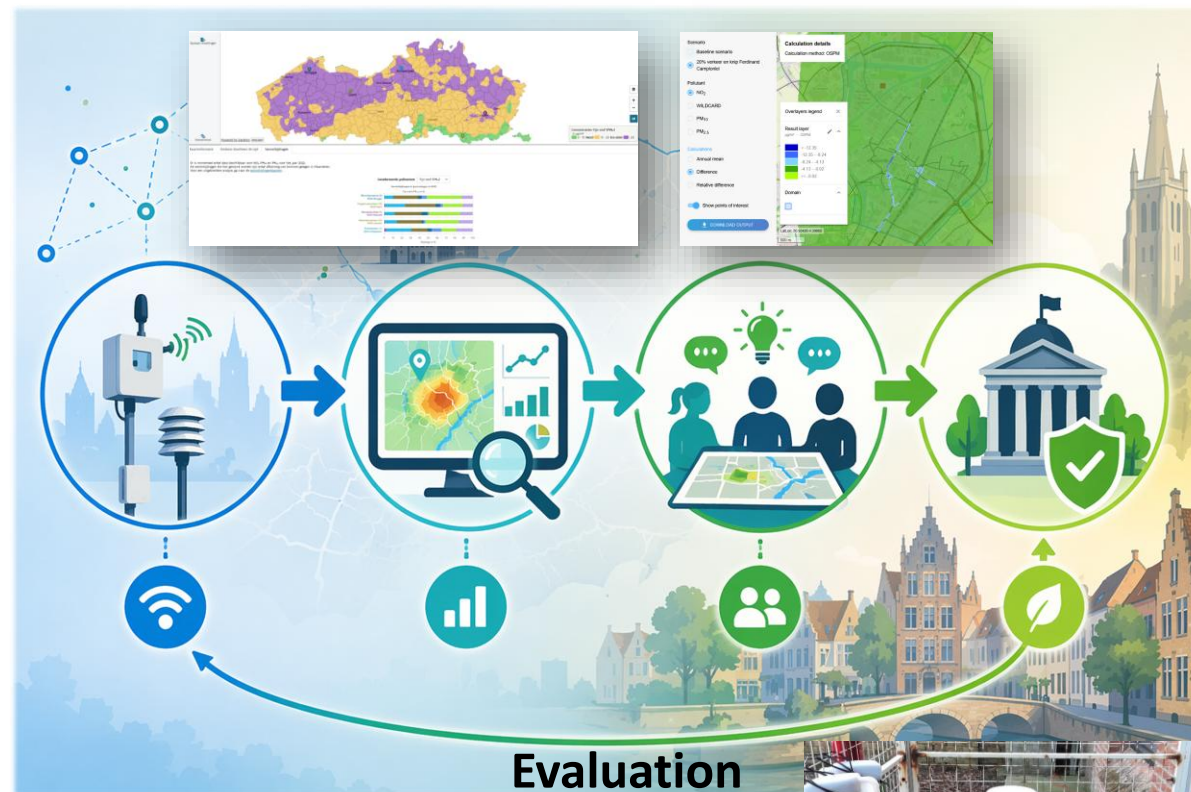
Workflow for air quality action planning in Bruges

Two main pillars:

- Deployment of an **air quality sensor network**
- Development of a **data-driven air quality action plan**



Moving from **monitoring** → **decision-making** → **action**



Objective of the action plan



BE ALIGNED WITH:



FLEMISH AIR POLICY PLAN 2030

Working towards clean
air and healthy living
environments



EU AIR QUALITY DIRECTIVE (2024)

Meeting updated EU
standards for cleaner
air by 2030



WHO GUIDELINE VALUES (TOWARDS 2050)

Aiming for levels that
protect health and
save lives

EVIDENCE-BASED POLICY



MONITOR

Measure air quality
and emissions
across Bruges



ANALYSE

Use data and
research to identify
key sources and
solutions



ACT

Implement targeted
measures with
stakeholders



REVIEW & ADAPT

Continuously evaluate
and adjust measures
based on evidence

MEASURABLE IMPACT



CLEANER AIR

Lower pollutant
levels (PM_{2.5}, NO₂,
O₃, ...)



BETTER HEALTH

Fewer respiratory
illnesses and
premature deaths



SUSTAINABLE CITY

Greener mobility
and a more liveable
Bruges



TRACK PROGRESS

Clear indicators
to measure and
report results



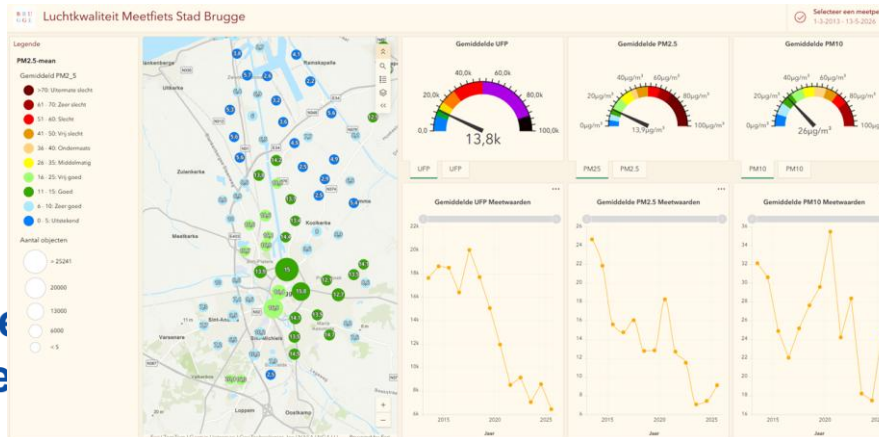
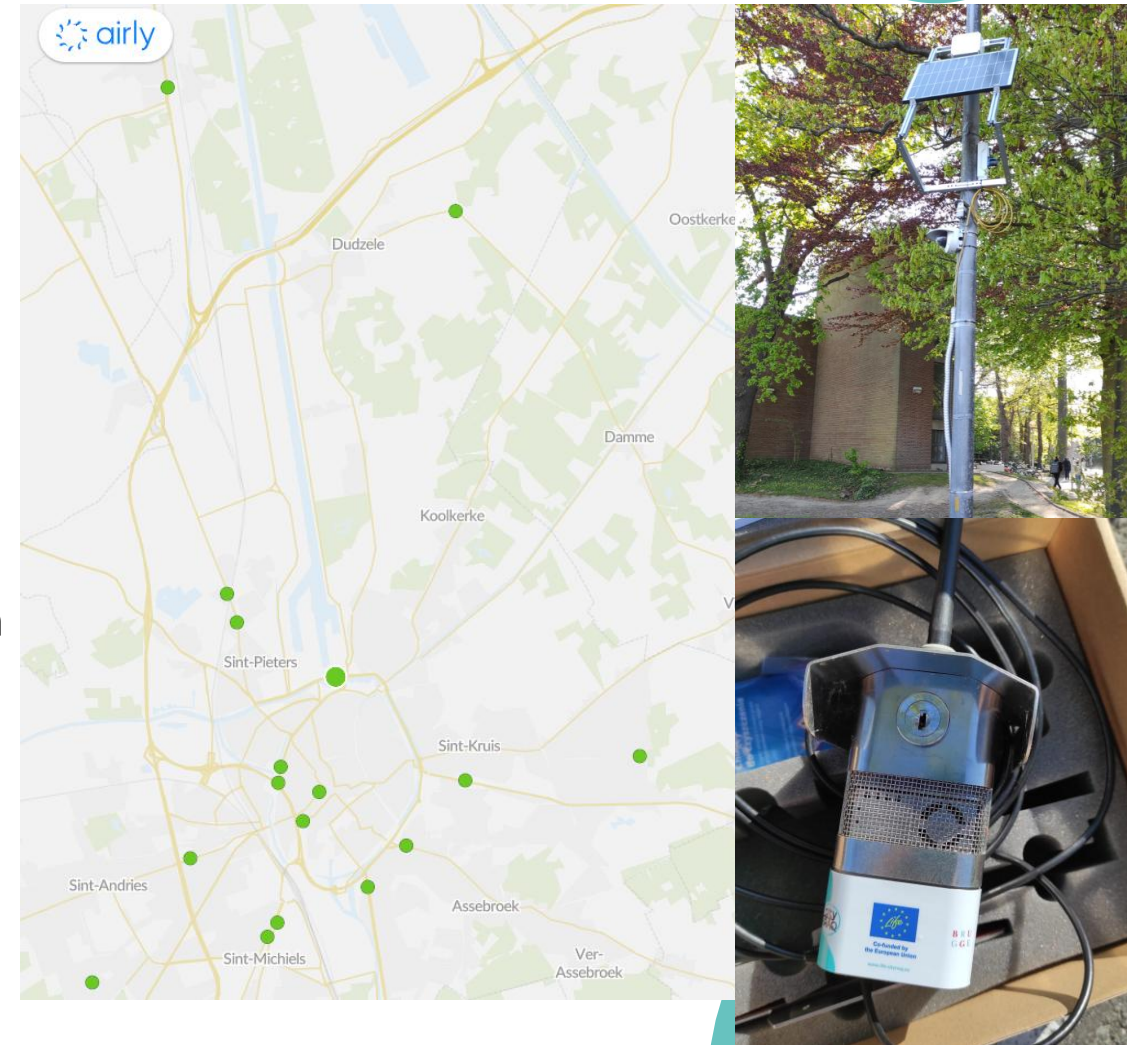
Medegefi
de Europ

Role of CityTRAQ in Bruges



CityTRAQ enables:

- High resolution sensor data collection
- Better understanding of:
 - Spatial variability
 - Local hotspots
- Integration with:
 - Existing datasets (VMM, city lab)
 - Modelling tools (e.g. ATMO-plan)
- CityTRAQ + collected data = **data backbone for the action plan**



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Framework and requirements from the tender



1. Process timeline and deliverables

The action plan process must be completed within a certain time and include a bottleneck analysis and prioritised measures

2. Transparency and engagement

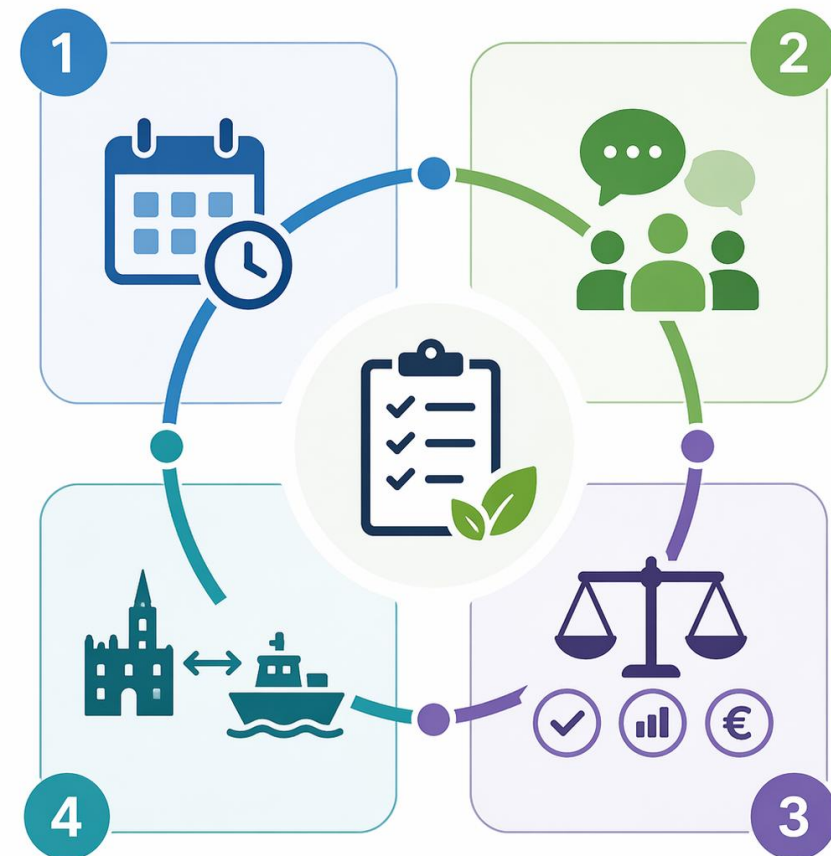
Monthly reporting and stakeholder engagement are required to ensure transparency and inclusivity throughout the process

3. Evaluation criteria and workflow

Measures are evaluated for feasibility, impact, cost-effectiveness

4. Tools and authority alignment

Use of tools like the assessmenttool and ATMO-plan, with alignment required between city and port authorities



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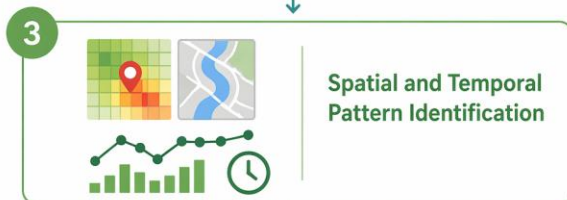
Step 1 – Data integration & Analysis



→ **Combining all sensor data (Airly, city lab data), emission data and public datasets** ensuring a robust and reliable data integration



→ Ensuring reliability and accuracy through rigorous **validation** and **cross-verification** of all data inputs



→ **Using combined data** to detect pollution hotspots and analyze patterns over time and locations + **establish baseline conditions**

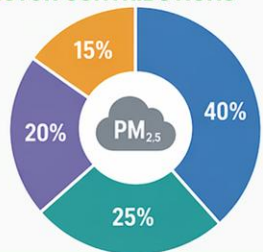


→ **Compare** with regulatory standards and guideline values

1 IDENTIFICATION OF POLLUTION HOTSPOTS



2 QUANTIFYING SECTOR CONTRIBUTIONS



TRAFFIC



INDUSTRY



RESIDENTIAL HEATING



OTHER

3 ITERATIVE DATA-DRIVEN ANALYSIS



4 → KNOWING WHERE AND WHY HOTSPOTS OCCUR



Step 2 – Identification of key air quality hotspots



→ The workflow maps **pollution hotspots** to highlight areas with the poorest air quality in Bruges for targeted interventions

→ **Sector contributions** such as traffic, industry, and residential heating are quantified to understand their impact on air quality

→ The process incorporates **stakeholder input** and iterative **data refinement** to ensure local relevance and effective outcomes – link emissions to measured concentrations

→ Detection of dominant pollution drivers

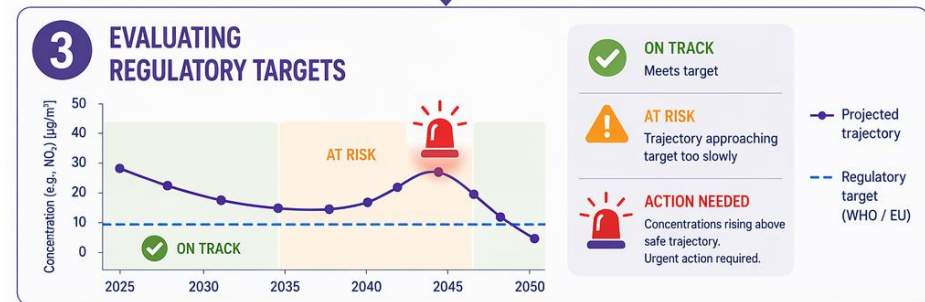
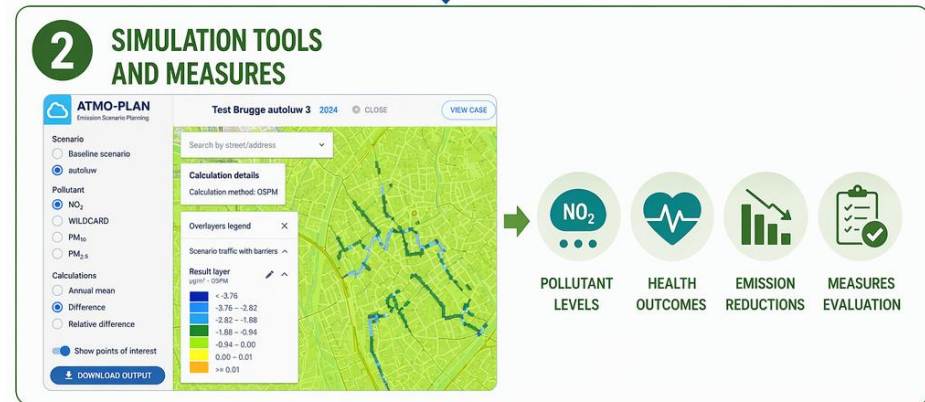
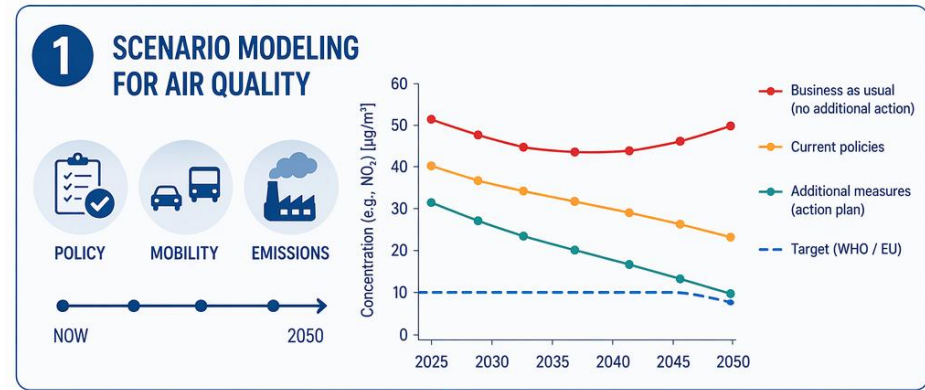
Step 3 - Future outlook & scenario building

1. Scenario modeling assesses future air quality trends considering policy, mobility, and emission changes through 2050.

2. Tools like ATMO-plan simulate effects of different measures on pollutant levels (and linked to health outcomes) → compare projected concentrations to targets

3. Check if current trajectories meet air quality regulations and highlight problems (e.g. critical areas) needing action.

4. Forward-looking approach ensures plans adapt to challenges in urban air quality management → highlight priority challenges



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Step 4 – Development of a longlist of measures



First operational output: Actionlist A



COMPREHENSIVE LONGLIST CREATION

→ Develop a detailed list of potential measures using expert knowledge, stakeholder input, and existing policies



MULTI-DOMAIN MEASURES

→ Include measures across transport, industry, urban planning, and residential heating for a holistic approach



EVALUATION CRITERIA

→ Assess each measure based on impact, feasibility, and local relevance to Bruges' context



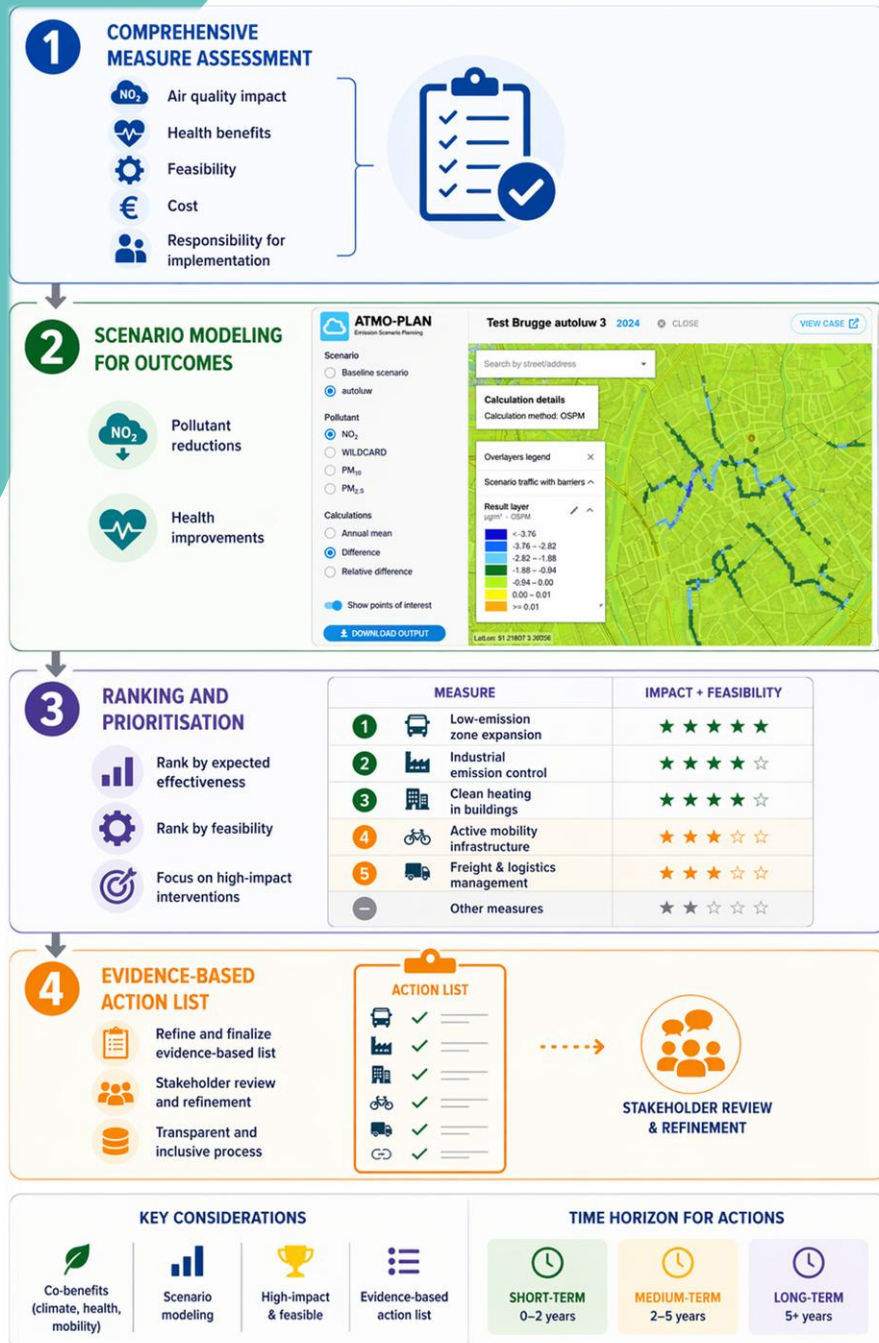
INCLUSIVE & ROBUST PLANNING

→ Ensure all viable options are considered to create an effective and comprehensive action plan, ensuring a broad coverage of all emission sources



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Step 5 – Evaluation & prioritisation of measures



1. Comprehensive measure assessment

Evaluate measures based on air quality impact, health benefits, feasibility, cost, and responsibility for implementation.

2. Scenario modeling for outcomes

Scenario modeling estimates pollutant reductions and public health improvements from each measure

3. Ranking and prioritisation

Measures are ranked by expected effectiveness and feasibility to focus on high-impact interventions + quick wins

4. Evidence-based shortlist

The evaluation refines ideas into an evidence-based intervention list for stakeholder review and refinement

➔ Transformation into Action list B

Step 6 – Refinement



ITERATIVE FEEDBACK PROCESS



1. **Combine selected measures**
into a coherent strategy



2. **Define timelines**
and responsibilities



3. **Establish monitoring**
and evaluation framework



4. **Ensure adaptability**
and periodic updates



Approval by Council
of Mayor and Aldermen

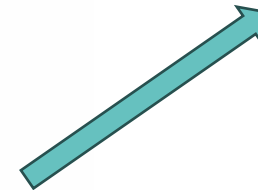


Refine into action list C
Finalise and implement

- ✓ Policy alignment
- ✓ Feasibility
- ✓ Local priorities
- ✓ Resource considerations



**BETTER AIR
FOR BRUGES**



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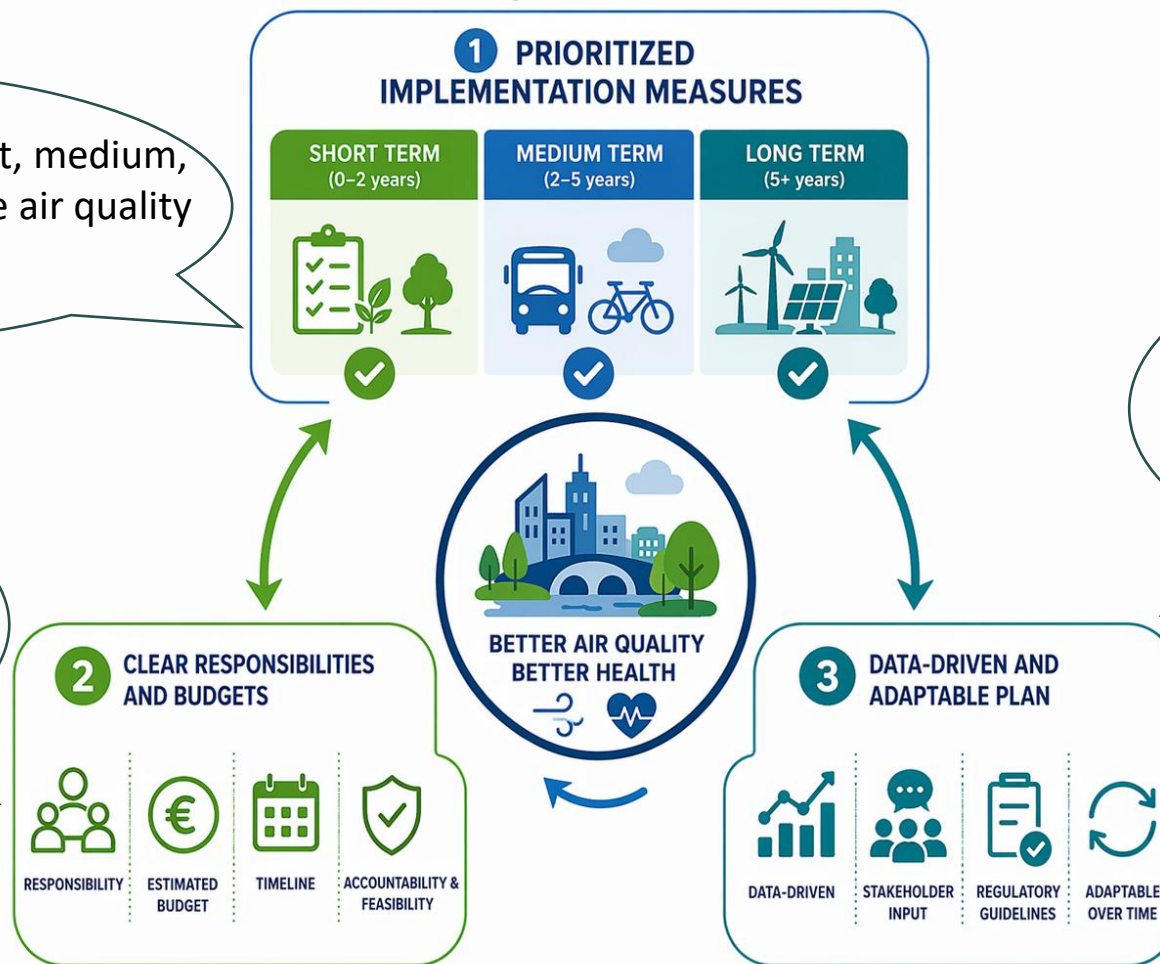
Step 7: Final action plan



Measures are prioritized for short, medium, and long-term actions to improve air quality and health outcomes.

Each measure includes defined responsibilities, estimated budgets, and timelines to ensure accountability and feasibility.

The plan is grounded in data, stakeholder input, and regulatory guidelines, making it measurable and adaptable over time.



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IMPROVED
AIR QUALITY



BETTER
HEALTH OUTCOMES



STRONGER
COLLABORATION



EFFECTIVE, MEASURABLE
AND ACHIEVABLE

Key take aways



Structured and data-driven workflow

The action plan development follows a structured, data-driven process ensuring evidence-based policymaking.



Emphasis on impact and feasibility

The plan balances ambitious goals with practical feasibility, focusing on health and environmental outcomes.



Stakeholder engagement and validation

Iterative stakeholder involvement ensures local relevance and strong community support for the plan.



Robust methodology strength

The plan's success is rooted in a robust methodology that guides the selection of effective measures.



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Questions?



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Peter van Breugel

LIMITING WOOD BURNING IN THE NETHERLANDS

CONTENT

- ☐ Wood burning contribution to PM concentrations
- ☐ Clean Air Agreement
- ☐ Wood burning indicator
- ☐ City of Amersfoort Practice



WOOD BURNING

Pros



- It gives pleasing heat in many households;
- Is legal;
- Reduces use of fossil fuel in winter.

Cons

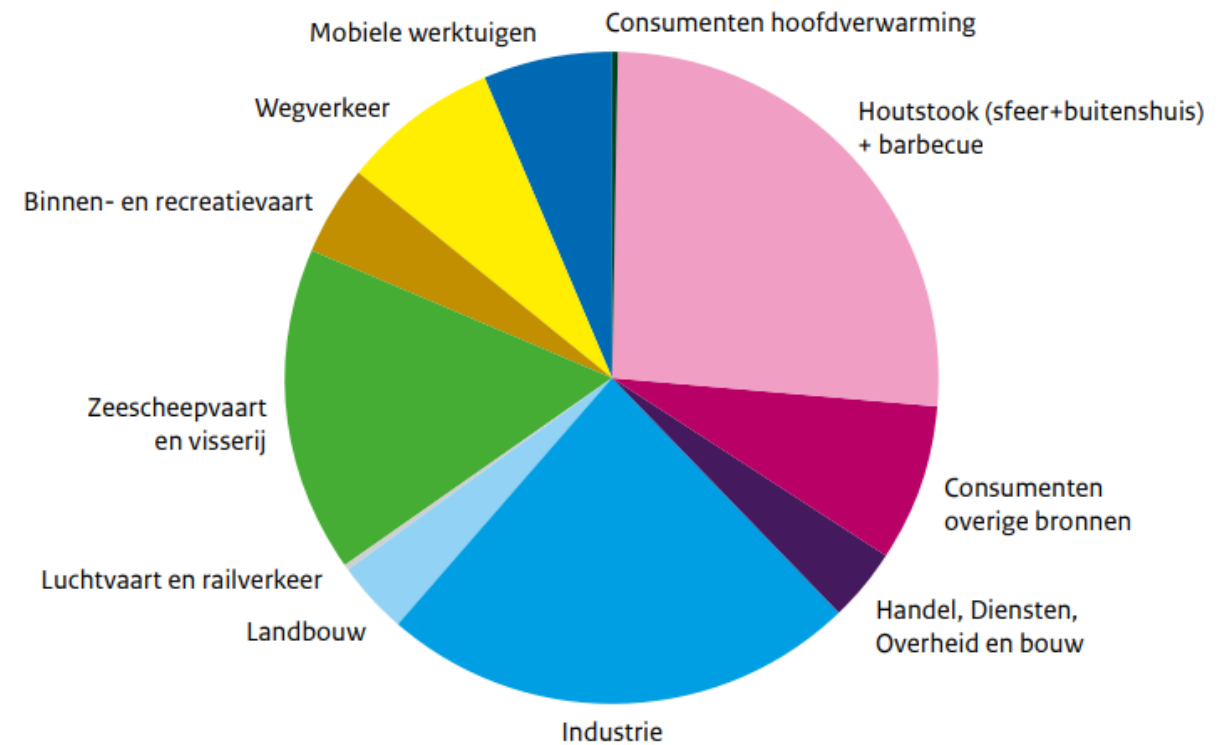


- Causes nuisance for local residents;
- causes adverse health effects;
- increases PM emissions.



WOOD BURNING: A RELEVANT SOURCE

- ❑ PM_{2.5}-concentrations decrease gradually of the last decades
- ❑ Wood burning is a large domestic emission source of PM (PM_{2.5})
 - other sources decrease in size:
 - In 1990 → 10% contribution and in 2021 → 25%
- ❑ but also a large contribution on immissions
 - Circa 10% contribution to current PM_{2.5}-concentrations
- ❑ Private wood burning one of the themes of the SLA (Clean Air Agreement)



PM_{2.5}-emissions by Dutch sources in 2021.

CLEAN AIR AGREEMENT

Agreement between government organisation to improve the air quality permanently.

Striving towards a health gain of 50% due to inland air quality sources in 2030, compared to 2016.

Measures are suggested for themes like mobility, industry, inland shipping and harbours, agriculture and wood burning (etc.).



FACILITATION FROM A NATIONAL LEVEL

The Clean Air Agreement suggests approaches for sources of air quality.

Regarding wood burning:

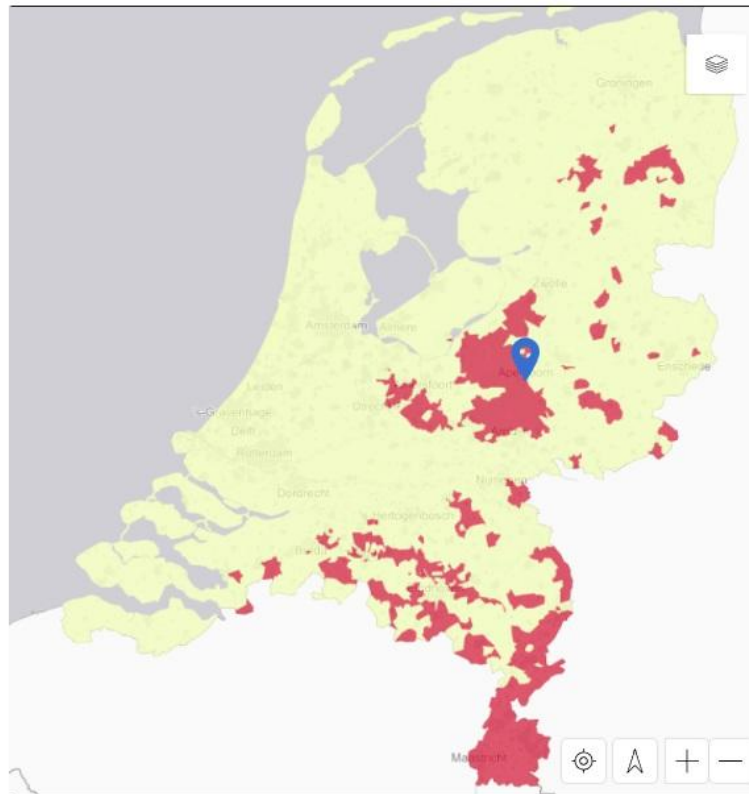
Free download of public adaptable information material for municipalities;

- Information on 'de stookwijzer' (Wood burning indicator);
- Information on pilots for a future ban on woodburning in districts to be built;
- Wood burning tips (use of 'swiss method');
- Route guide wood burning and nuisance.





Of klik in de kaart om een locatie te kiezen.



Nieuws

Nieuwsbrieven

Workshops

iniging

Code Geel

Code Oranje

Code Rood

Stook geen hout

De rook waait niet goed weg, omdat er weinig wind staat. Of de luchtkwaliteit is op dit moment slecht. Nu stoken zorgt voor extra overlast. Bij mensen met longklachten en anderen kunnen gezondheidsklachten optreden. Houd rekening met je burens.



Oude Apeldoornseweg 24, 7361EH Beekbergen

Luchtkwaliteitsindex en windkracht

De Stookwijzer combineert de waarden van de luchtkwaliteitsindex (LKI PM2.5) met de windkracht.



Luchtkwaliteitsindex: 1/11
(1 = goed, 11 = zeer slecht)



Windkracht (Bft): 2

Verwachting komende 24 uur

Let op: dit is een verwachting. Deze kan nog veranderen. Definitieve verwachtingen en adviezen zijn gemarkeerd met een slotje.

Laatst bijgewerkt op 11-05-2026 10:00

Dag en tijd	Verwachting	
Maandag 10:00	Code Rood	
Maandag 16:00	Code Geel	
Maandag 22:00	Code Geel	
Dinsdag 04:00	Code Geel	

Overlast melden

Hout stoken kan rookoverlast veroorzaken, zeker in een dichtbebouwd gebied. Heb je last van de vuurkorf, houtkachel of open haard van de burens? Meld dit via de knop Overlast melden.

Overlast melden →

Deze melding gaat automatisch naar de gemeente, als deze aangesloten is bij de Stookwijzer. In andere gevallen gebruiken wij jouw melding om een beter beeld te krijgen van de overlast door

CITY OF AMERSFOORT PRACTICE



Duty of care ('Zorgplicht') for wood burning in Amersfoort since october 2024

Motivation policy rule

There is danger to the public health, or nuisance if wood is burned during 'Code orange/red'. In these circumstances, it is reasonable to ask inhabitants not to burn wood. It is a balance between conviviality and health.

Duty of care art 22.18 lid 1 en 2 sub a Op

1. The person who uses a construction and knows, or reasonably could know that use can cause a risk to public health or safety, is obligated to take all measures that reasonably can be taken in order to prevent that risk or to not let it continue.
2. These situations at least include nuisance by:
 - a. In a bothersome manner emitting of smoke, soot, fumes, dust, stench or moisture.

PRACTICE IN AMERSFOORT

In the year 2024 mainly warnings were given.

The municipality only enforces with notorious offenders and nuisance reports. If neighbours have made mutual agreements on wood burning and everybody is fine with that => no fines.

Also, houses or boats where wood burning is the only method of heating, would not get a fine.

In the year 2025 one fine was given to an inhabitant. This fine is paid for, so the case did not appear before the judge.

Complication: In the year 2026, the province of Utrecht is suffering from net congestion, hence it could take a long time for new houses to get an electricity connection.

PRACTICE IN UTRECHT

Since Januari 1 of 2025, wood burning in the open air is not allowed in Utrecht, even not in the own back yard. This applies to fire pits ('vuurkorven'), pizza ovens and patio heaters. Only BBQ-ing on charcoal, gas or elektricity remains allowed.

From the year 2027 the city of Utrecht will ban wood burners in newly built houses.

From the year 2030 Utrecht plans to total ban on indoor wood burning within city limits.



LOOKING INTO THE FUTURE

The limit values of the new air quality directive are valid in 2030.



Municipalities will need to make a plan in order to prevent limit value exceedance of $PM_{2.5}$; and wood burning is the biggest inland source of $PM_{2.5}$.

=>> a growing interest from other municipalities in the approach of Amersfoort.

However, the legal basis of this approach is not yet tested thoroughly in practice. Time will tell!

QUESTIONS?



LIFE cityTRAQ final conference



18 June 2026

Michiel Kleinnijenhuis



Gemeente Utrecht

www.utrecht.nl/luchtkwaliteit

Dom tower



Utrecht



Netherlands Central



400,000 inhabitants in 2030



the home of Miffy

Oudegracht



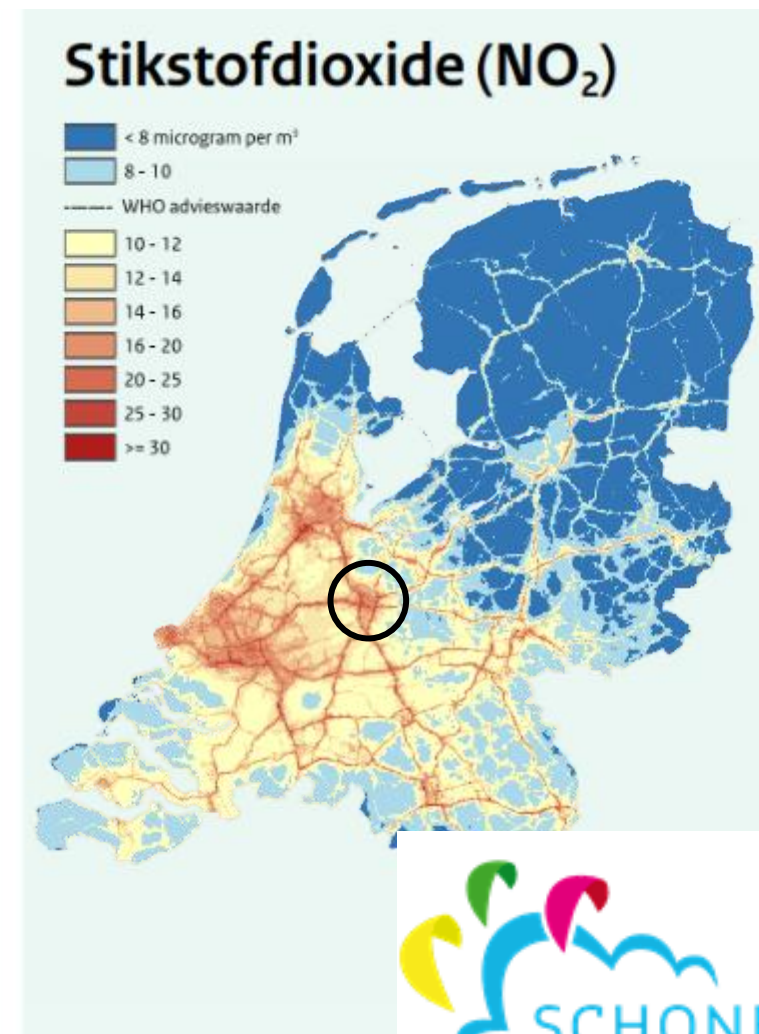
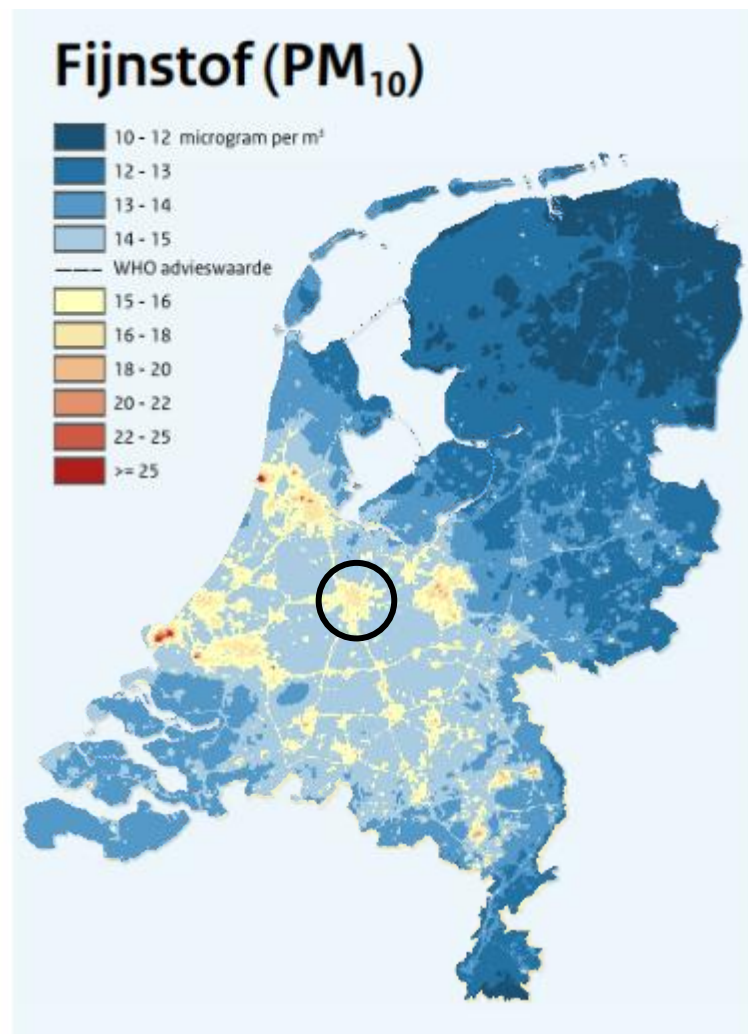
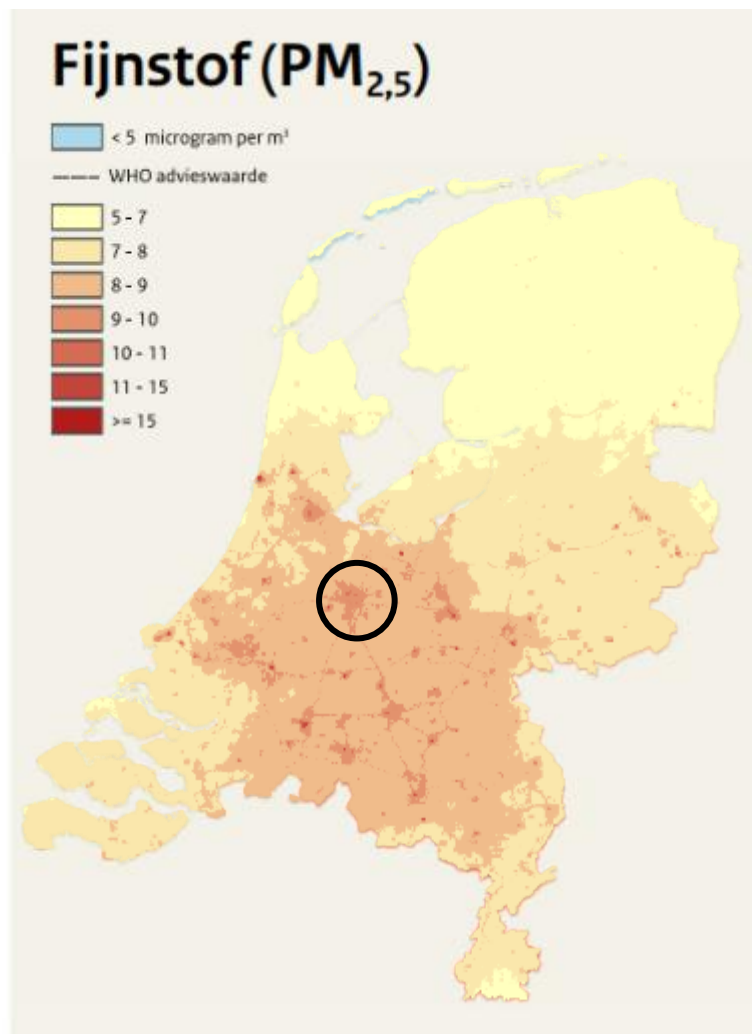
cycling city of the year



Gemeente Utrecht

Utrecht / the Netherlands (2024)

Atlas Leefomgeving, 2026

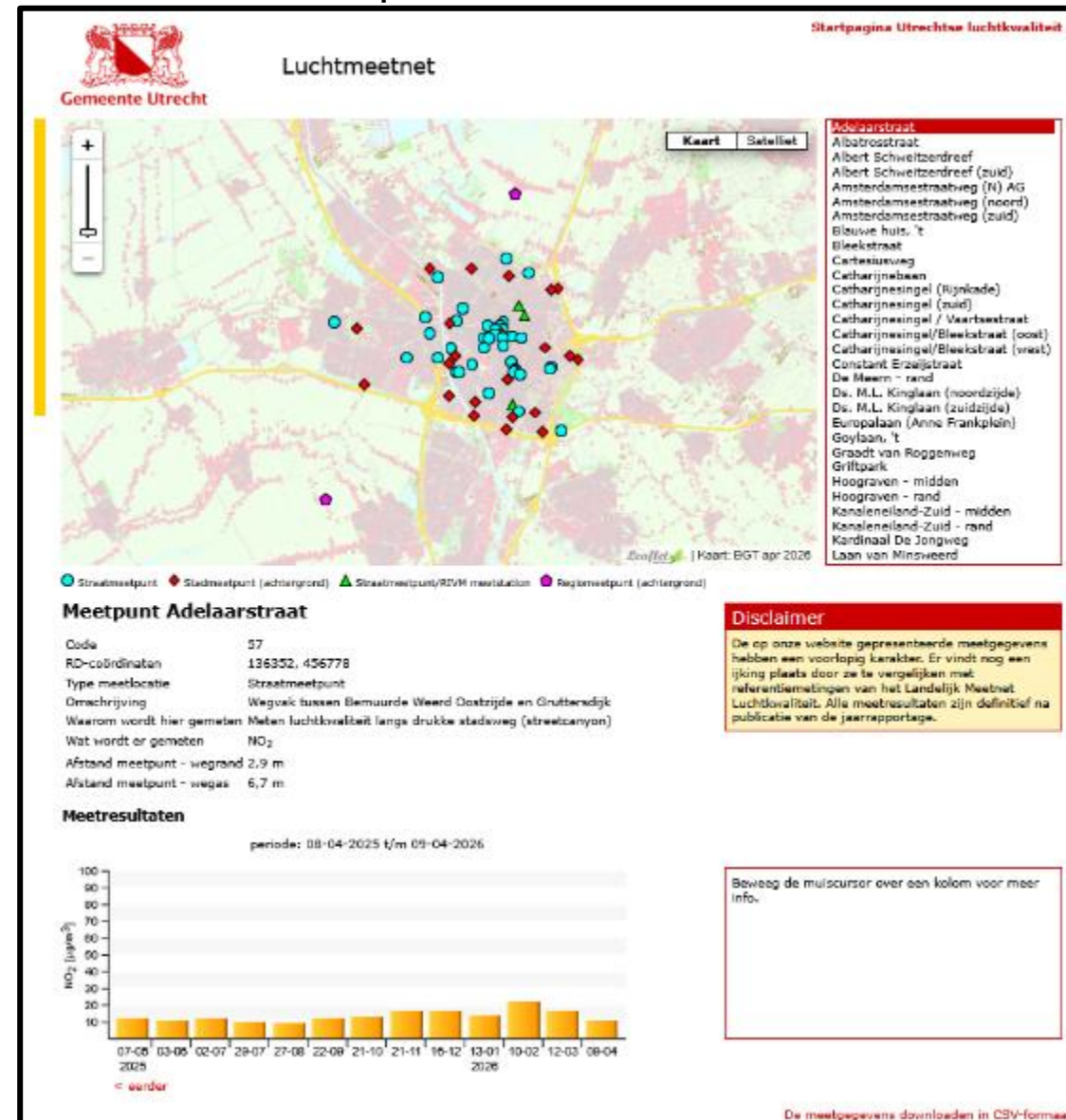
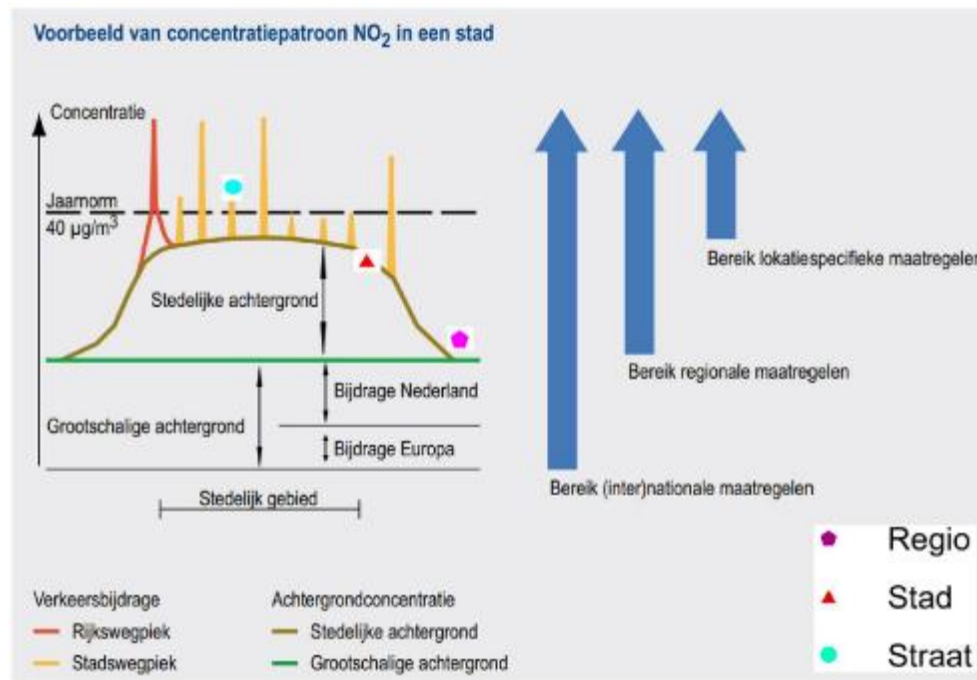


- In EU compliance now, but uncertain for 2030 (NO₂)

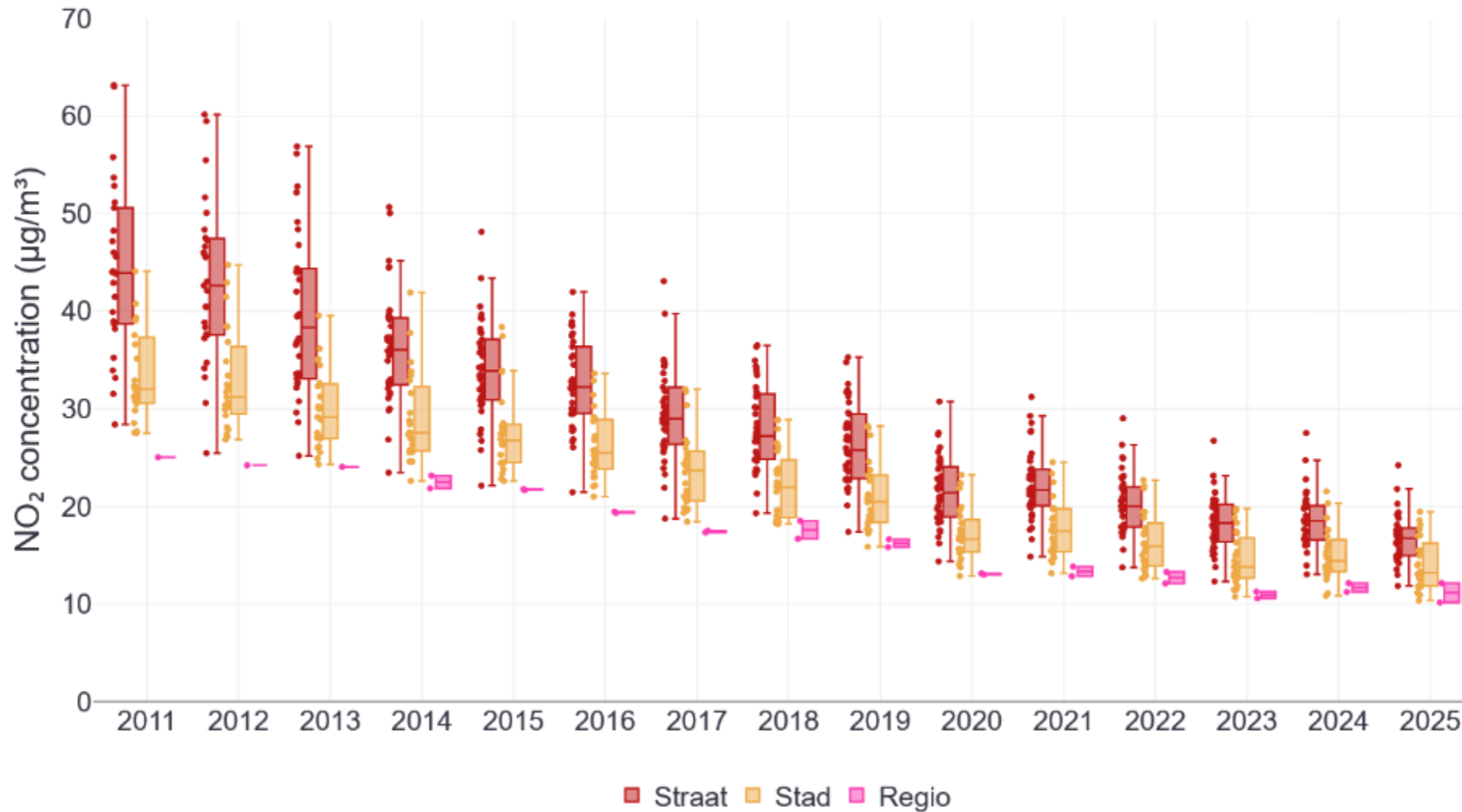
NO₂ measurement network

<https://www.utrechtmilieu.nl/meetnet/>

- Palmes diffusion tubes
- 60+ locations (rural, city, street)
- every 4 weeks since 2011



NO₂ decreases over 2011-2025



- NO₂ reductions of more than 50%

- rural: 55%
- city: 59%
- street: 62%



Policy note 2025: leading principles



We are working towards a zero-emission city.



Where non-binding policies prove insufficient, we implement mandatory policies.



We focus on local sources with the largest air quality / health benefits attainable



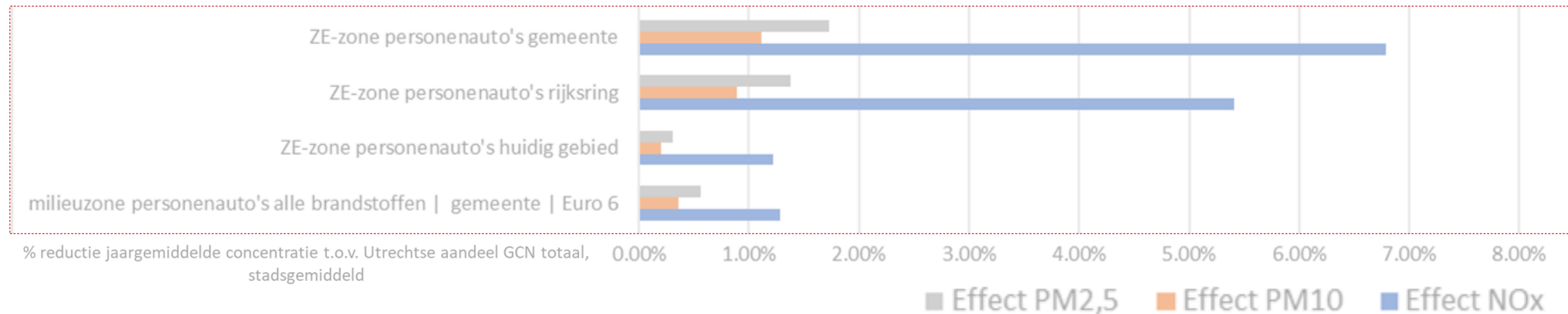
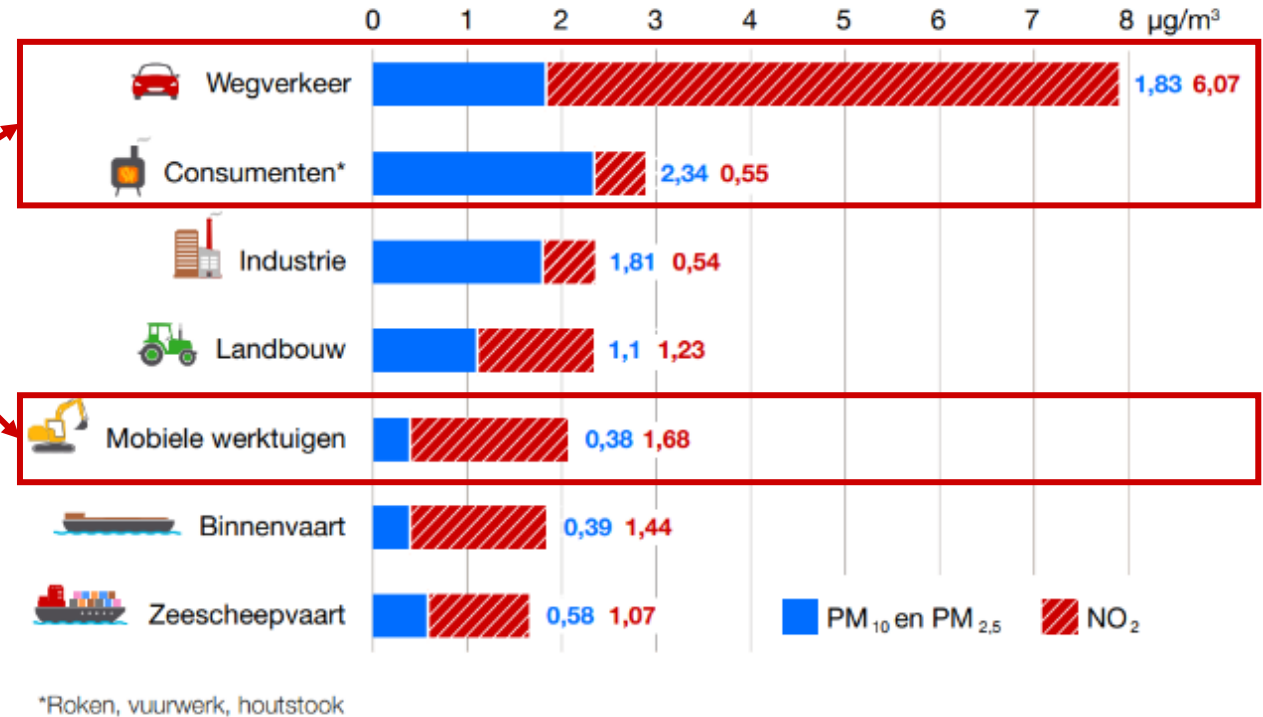
Everybody contributes: citizens, businesses, city council.



The main polluters

- influence through local policies
- influence through regional, national, international collaboration: all sources
- evaluation of many potential measures

Grootste bronnen van luchtvervuiling in Utrecht in 2030

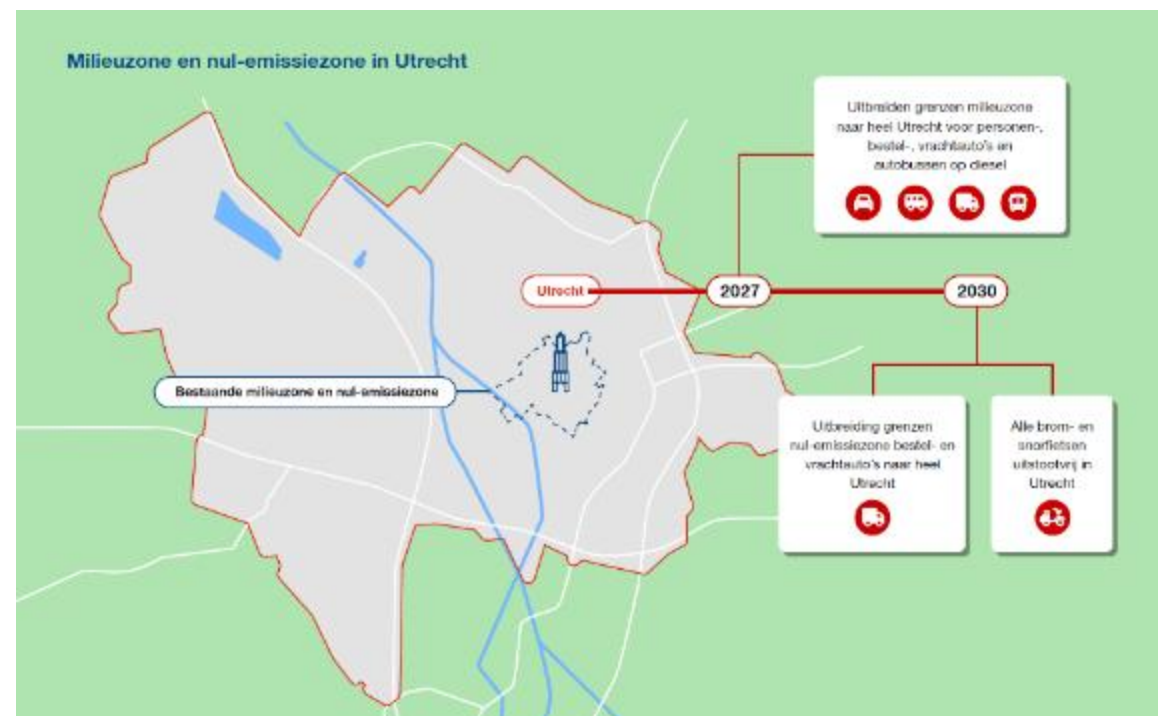
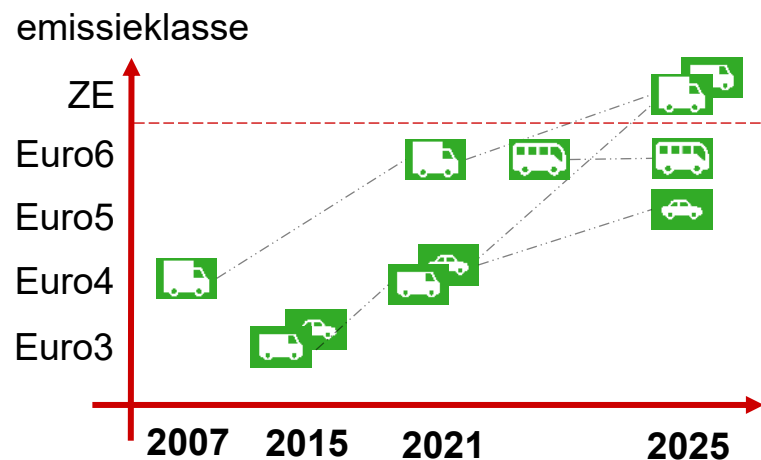


Policies: road traffic

Trias mobilica:

1. Reduction in movements
2. Modal shift
3. Cleaner vehicles

low emission zone: history



planned policies:

- 2027: geographical extension low-emission zone (diesel)
- 2028: implementation of moped zone
- 2030: geographical extension zero-emission zone (logistics)

Wood burning: past



Communication campaigns



Subsidy for removing fireplaces and flues

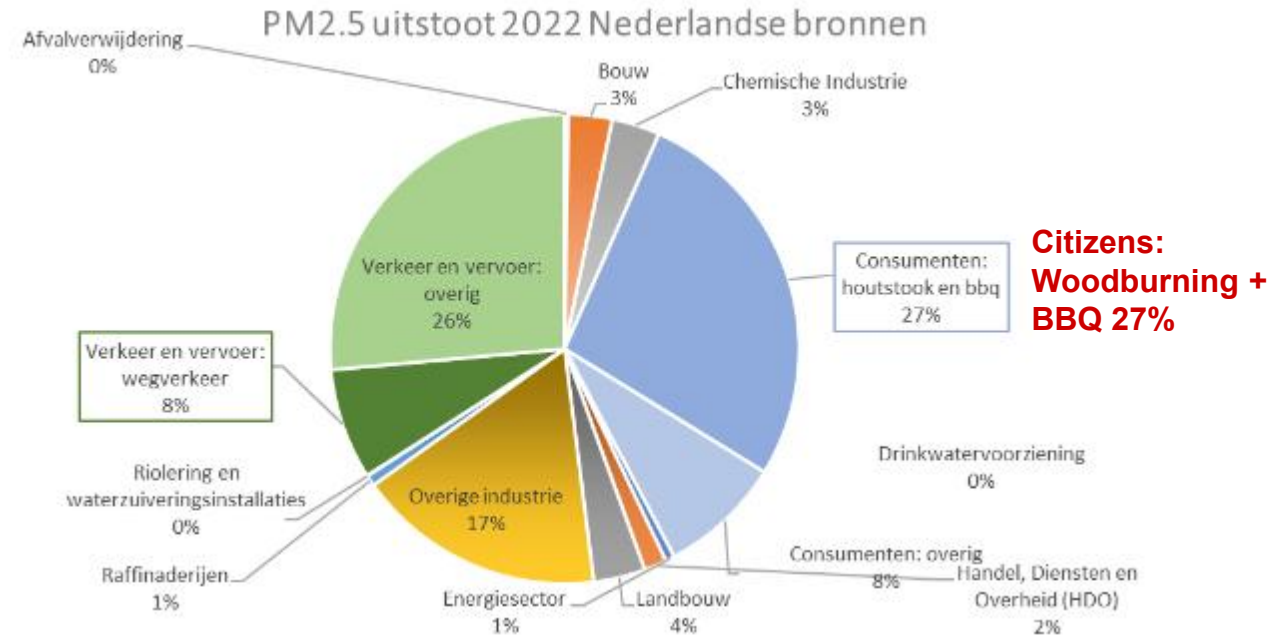
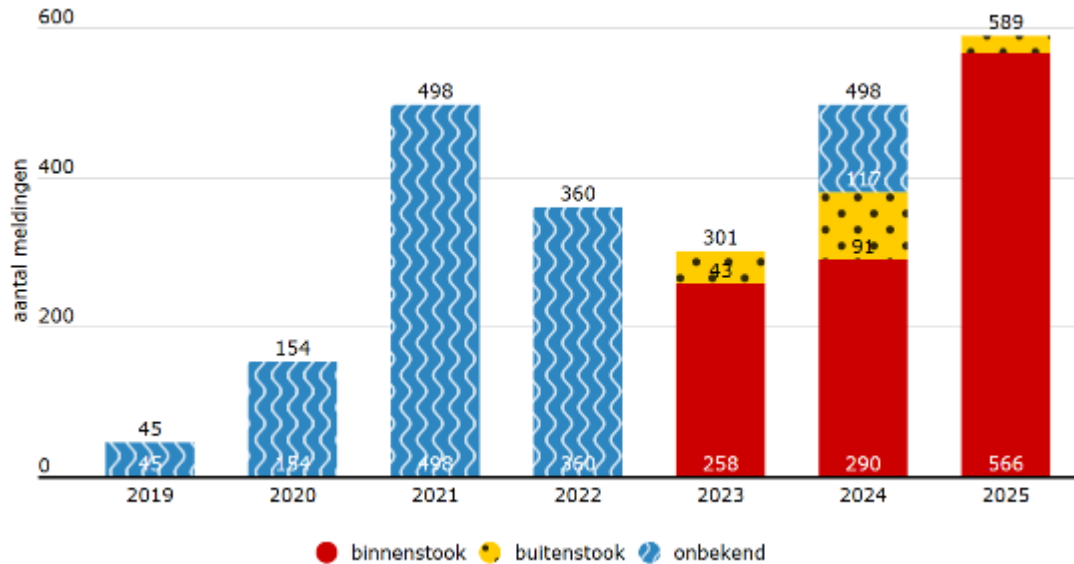


Wood-burning ban (outside)



Wood burning: present

reports / complaints



new policies:

- 2030: wood burning ban
- 2025: no flues in new housing development
- 2025: expanded communication campaign (behaviour change)



Wood burning: planned

- General ban in 2030
- topics under investigation:
 - legal framework
 - implementation in environmental plan
 - compensation for lawful government action
 - exemptions



Behaviour change campaign

- Working towards ban in 2030
- Behavioural analysis
- Pilot exhibition in a selected neighbourhood
 - Many children
 - Gentrified
 - Older buildings
 - Complaints

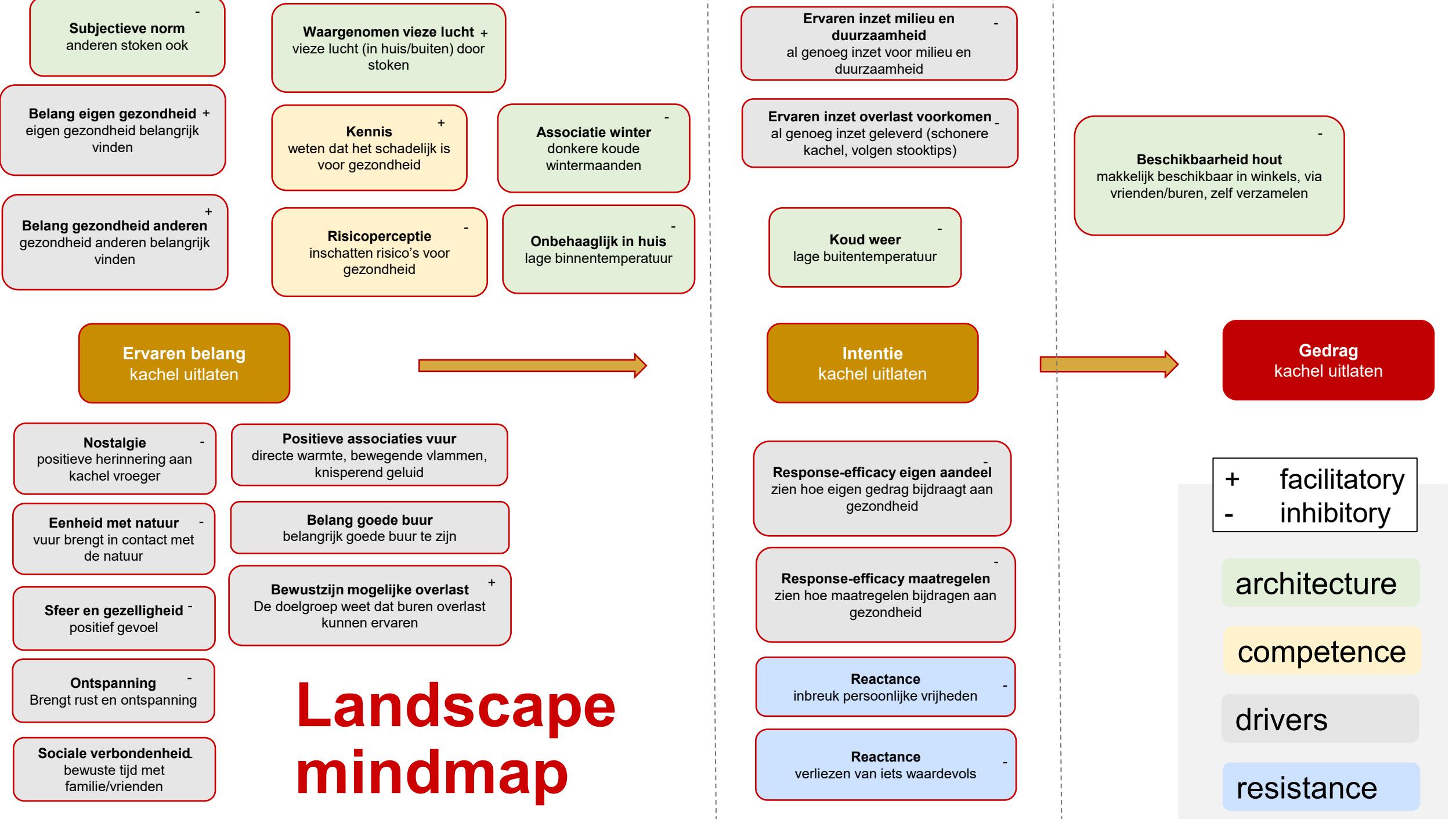


Wood burning behaviour change

Target behaviour: *Residents of Utrecht aged 25 and older who burn wood at home for ambience use their wood stove, fireplace, or pellet stove less frequently during the heating season (October through March).*

- landscape analysis → potential factors
- interviews + questionnaire → test relevance of factors
- selected factors → technique selection
- factors and techniques → concept intervention





Relevant factors (and associated techniques)

- Factors associated ($r > .30$) with intention to reduce wood burning:
 - Reactance: personal freedom (acknowledging resistance)
 - Reactance: losing something valuable (altercasting)
 - Scepticism: policies (self-convincing)
 - Positive associations: fire (providing metaphors)
 - Knowledge of health effects (informing)
- Additional factors:
 - Awareness of nuisance (self-convincing)
 - Valuation of health (activating value)

Intervention

<https://youtu.be/WZGtBpeXMDY>

- animation video

guaranteeing



- tree leaves: wood burning alternatives

local heroes

altercasting

- panels:

metaphore

- did-you-know...?

- air quality policies

informing

- woodsmoke-free January

unity

commitment

minimize request



- information sessions and on-street conversation

self-convincing

acknowledging resistance



Thank you for your interest!

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**Denk
Mee**



PANEL DISCUSSION: AIR QUALITY & URBAN POLICY



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1. From problem definition to priorities



How do you decide where and what to focus on in an air quality action plan?



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2. From analysis to measures

How do you translate analysis into concrete and feasible measures?



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3. Implementation, ownership and monitoring



How do you ensure that an air quality plan is actually implemented, monitored and kept alive over time?



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Audience poll

[Air quality action planning poll - Mentimeter](#)



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B R U
G G E



VLAAMSE
MILIEUMAATSCHAPPIJ



Rijksinstituut voor Volksgezondheid
en Milieu
*Ministerie van Volksgezondheid,
Welzijn en Sport*

PARTNERS



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