Low Emission Zones in the heating sector: a tale of EU cities

Research findings from the compendium

Irene Chiocchetti, Policy Analyst

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Low Emission Zones in the heating sector

project overview

Context:

→ Residential heating is the leading source of PM2.5 emissions in urban areas in Europe, mainly due to the use of solid fuels (coal and wood).

→ EU policies (e.g., Ambient Air Quality Directive and European Performance Building Directive) created a mandate for cities to act on emissions from heating.

→ However, issue of public resistance to certain measures, in particular from vulnerable groups.

Aim:

To guide local authorities on policy options to implement clean heat policies in a socially acceptable manner.

Work:

- **Compendium** with residential heating policies across the EU
- **4 case-studies** deep diving into local realities
- **Final report** synthesising main outcomes and providing recommendations

Compendium

i. It gathers a **selection of heating measures** adopted by European cities that would impact air quality.

ii. It showcases **concrete examples** to reduce emissions, while addressing social and economic challenges.

iii. It aims to **raise awareness**, transmitting lessons learnt and best practices.

iv. It includes a brief description of the policy, including **socioeconomic factors.**

Selection of cities

- Good geographical coverage of EU Member States, and non-EU, such as the UK and Norway.
- Most relevant cases linked to heating needs.
- Capital and large cities are typically more polluted and richer, but some smaller cities are included.
- **Main criterion**: design and implementation of policies at the municipal level, or when cities go beyond the implementation of regional and national policies.
- Additional examples are available in the **Annex**.

Available here: https://ieep.eu/publications/improving-air-quality-with-residential-heating-policies/

Types of policies

1. Bans on burning wood or on certain types of fireplaces;
2. Bans on specific types of boilers fuelled by polluting fuels (such as wood, coal, and oil);
3. Financial incentives for citizens encouraging behavioural change;
4. Investments in building retrofits;
5. Strategies promoting the switch from fossil fuel-based heating to clean technologies.

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Divided into *3 main categories* determined by the link with air quality

1. Specific regulations **directly** improving air quality
2. Policies improving air quality that are part of **broader regulations**
3. Measures embedded in **broader strategic frameworks** that pursue **other overarching objectives**, which can have positive effects on air quality.

Focus on the socio-economic considerations to increase social acceptance

When available, we included **socio-economic considerations** such as:

- Subsidy schemes
- Public consultations
- Stakeholder engagement
- Information campaigns
- Elements related to inequality issues and economic vulnerability.

➢ Key aspects to ensure a **just transition**

➢ This helps identify **key challenges** that may impede the effective implementation of these policies, or **favourable actions** to maintain **public support**, including from **vulnerable communities**.

Example 1 – Skawina

Anti-smog resolution of the Małopolska Region (2017)

Progressive ban of burning solid fuels for residential heating:

- Started with a ban on using low-quality coal and wet wood;
- Will finish with a complete ban on coal in domestic heating installations from 2030 (in Skawina)

- Applies to all entities in the city.
- Compliance is ensured by the municipal authorities.

Financial support:

- Different types of subsidies: promoting new heat source and energy source, replacement of polluting old fuel boilers and stoves, addressing energy poverty:
  - Clean Air Programme;
  - Municipal budget and EU funds;
  - Stop Smog Programme (2019-2023)
- **Impacts**: in 2011, 161 days exceeded the daily norm for PM 10 concentration VS. 16 days in 2023.

Example 2 – Malmö

Seasonal and spatial limits on solid fuel-burning stoves (2019)

- Between 1 April and 30 September, in **certain densely populated areas**, **prohibition on burning solid fuel for heating** and hot water production in a boiler that is not environmentally approved.
- The city also provides recommendations on how and when to burn wood to limit pollution.
- **Sanctions**: enforcement is handled by Malmö's Environment Department, and violations fall under Article 29§1 of Sweden's Environmental Code.

- **Communication**: in Sweden, local governments disseminate information on public websites to encourage awareness of cleaner wood-burning practices and to disseminate knowledge of specified local zoning regulations.

Initial conclusions

Affordable, clean heating is increasingly recognised as a need by European municipalities

Various measures resemble or are inspired by the logic of LEZ

Strengthened link between air quality and clean energy at local level

Flexible approaches, supporting schemes, and clear communication are key for efficient implementation

Integrating clean heating measures in broader local frameworks can strengthen local action

It's important to provide adequate safeguards against the risk of exacerbating vulnerability to air pollution, and energy price volatility

One-fits-all solutions will not work, but best practices can be identified and transferred with targeted scopes

Next steps of the project

Case studies: Sofia (published), Kraków, Madrid and Utrecht

Final report

Final event

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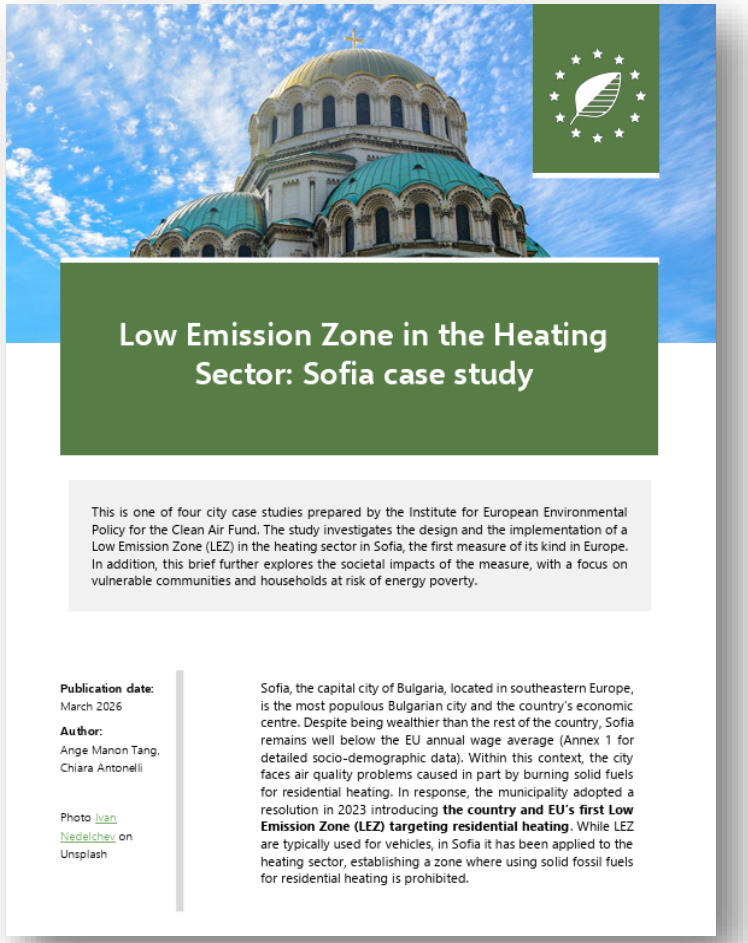
Low-Emission Zone in the Heating Sector: Sofia Case Study

Ange Manon TANG, Policy Assistant

Low-Emission Zone in the Heating Sector: Sofia Case Study



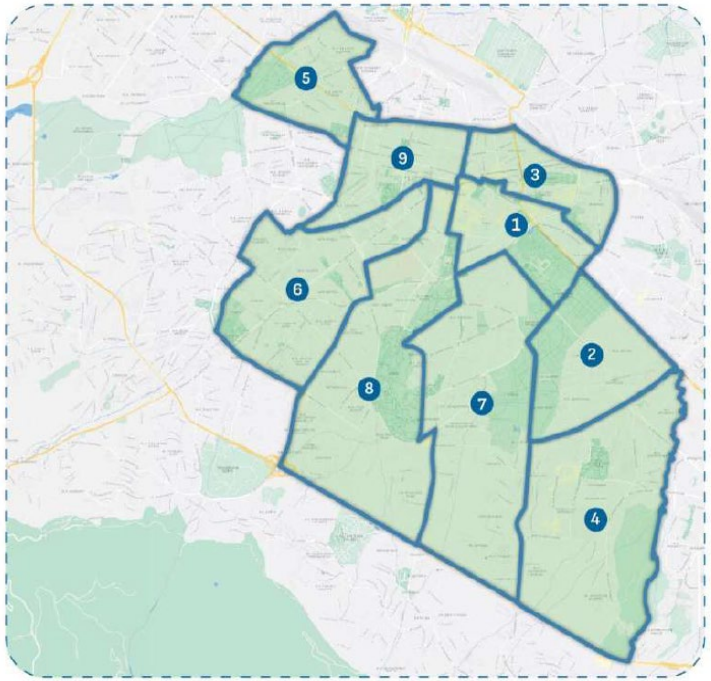
https://ieep.eu/publications/low-emission-zone-in-the-heating-sector-sofia-case-study/

Sofia's specific air pollution challenges:

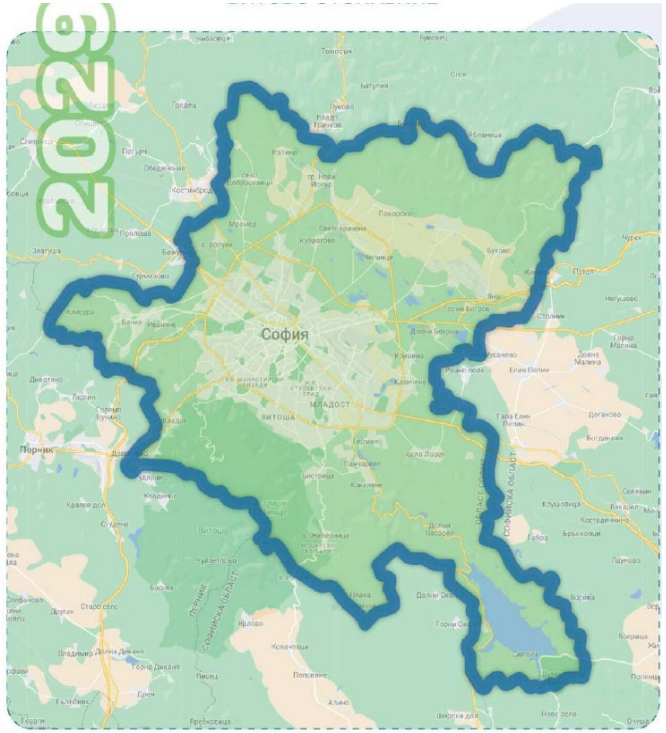
- **What?** Concentration of PM 10, PM2.5, Benzo(a)pyrene, NO2 above WHO guideline
- **Which source?** For PM, mainly from burning solid fuels for residential heating
- **Why?** Households burn mainly wood and coal
- **By whom?** More likely low-income groups (i.e., the Roma community), single-family home districts, the elderly, the unemployed and the retired
- **Where?** Mostly in suburban areas
- **Consequences?** Households' health (i.e., breathing and cardiovascular issues); costs (2.6 billion EUR annually in Sofia)

Local legal pressure and policy response – the LEZ

- 2021: city court ruling against poor air quality in Sofia
- December 2022: adoption of the Ordinance establishing LEZ (transport and residential heating)
- December 2023: LEZ for transport
- January 2025: **ban on solid fuel heating for residential heating in 9 central districts**
- December 2025: end of the replacement program funded by LIFE
- January 2029: **ban applicable for the entire municipality**
- 2021-2027: Financial support from the Operation Environment Program



Metropolitan areas in Sofia where the ban on solid fuel heating applies to buildings from January 1st, 2025. From (Sofia Municipality , n.d.)



Sofia municipality, where the ban on solid fuel heating will start from January 2029. From (Sofia Municipality , n.d.)

Social aspects: Investigation and stakeholders' consultation (1/2)

Social considerations during the LEZ design and social concerns

- Affordability – core topic
- Vulnerable communities (i.e. children and the elderly)
- Energy poverty
- Lack of realistic alternatives, fairness of the measure, trust of authorities

Stockholder engagement

- Institutional and technical stakeholders (i.e. municipal and public health authorities)
- Civil society organisation (self-involvement)
- Public consultation with some comments addressed

Public resistance, acceptance and opposition

- No significant public opposition (air quality issue is a well-known topic, the ban affects only central districts, lack of knowledge on the ban, not a big culture of collective mobilisation)
- Ban challenged legally by NGOs and citizens 'groups

Social aspects: Investigation and stakeholders' consultation (2/2)

Health effects	Social impacts	City challenges
• Health benefits at a general level • No research linking the LEZ to the improvement • Evaluation planned to be scenario-based	• Hard to address because of the lack of data (aggregated vs disaggregated) • Vulnerable communities (house ownership issues) are ineligible for replacement programs	• Administrative (limited nb of employees, lack of coordination, heavy process…) • Technical (lack of data-collecting system) • Infrastructure readiness and housing stock quality • Finance (fragmented, time-limited, project-based)

Recommendations for policymakers

Conduct your research and be transparent

- Collect reliable data on air pollution, trying to gather disaggregated data by socio-economic groups and areas
- Investigate different scenarios based on data and discuss them with impacted stakeholders

Involve all stakeholders from the early stages

- Get in contact with stakeholders as early as possible to better understand the population's needs
- Be in touch with local representatives of vulnerable communities and NGOs

Cultivate proactive and targeted communication

- Focus on messages that resonate with the population such as health benefits
- Give a particular attention to vulnerable communities and low-income households to make sure they are aware of the heating measures

Adopt a holistic approach

- Consider the importance of interconnection between energy, housing and social policies to create sustainable solutions for households
- When the budget is limited, prioritise what is the most important

Adopt a “Carrots before sticks” approach

- Restrictive measures are most effective and socially acceptable when affordable alternative are available ahead to support behavioural change
- Targeted funding is crucial where the demand for financial support exceeds available resources

Thank you for your attention

Irene Chiocchetti ichiocchetti@ieep.eu
Ange-Manon Tang amtang@ieep.eu

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