Unseen Emissions: Health risks cut by shifting from gas to electric cooking in real homes

Greenpeace Research Laboratories, ***Greenpeace CEE Croatia*** *and* ***Greenpeace Hungary***

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Dr Aidan Farrow

afarrow@greenpeace.org

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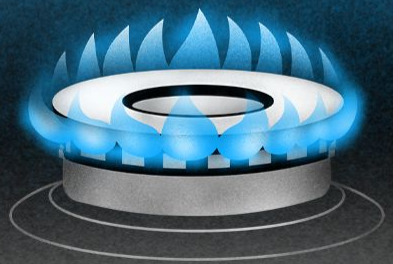
NEVIDLJIVE EMISIJE:

Smanjenje zdravstvenih rizika prelaskom s plinskih štednjaka na električne u stvarnim kućanstvima



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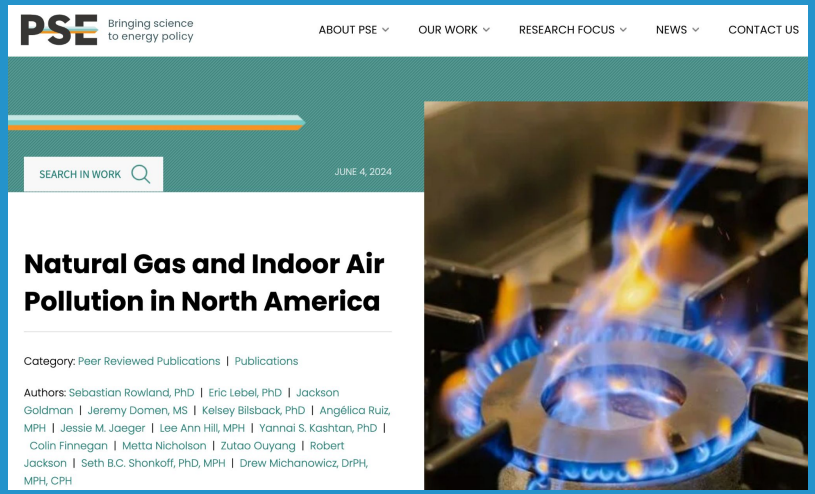
Gas cooking linked to higher NO_2 & electric cooking linked to better indoor air quality in europe.



US fossil gas contained benzene, a known carcinogen, in 97% of samples.

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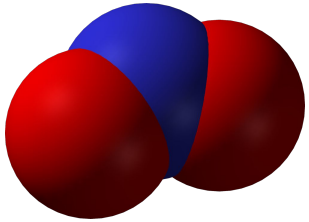
Nitrogen Dioxide



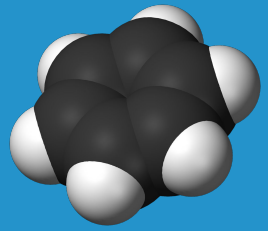
WHO: 10 / 25 / 200 $\mu g/m^3$ **guidelines**

NO_2

Respiratory problems, asthma, lungs

Children and people with pre-existing conditions

Benzene (VOC)



WHO: No safe level

C_6H_6

International Agency for Research on Cancer:

A known carcinogen

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Experiment design

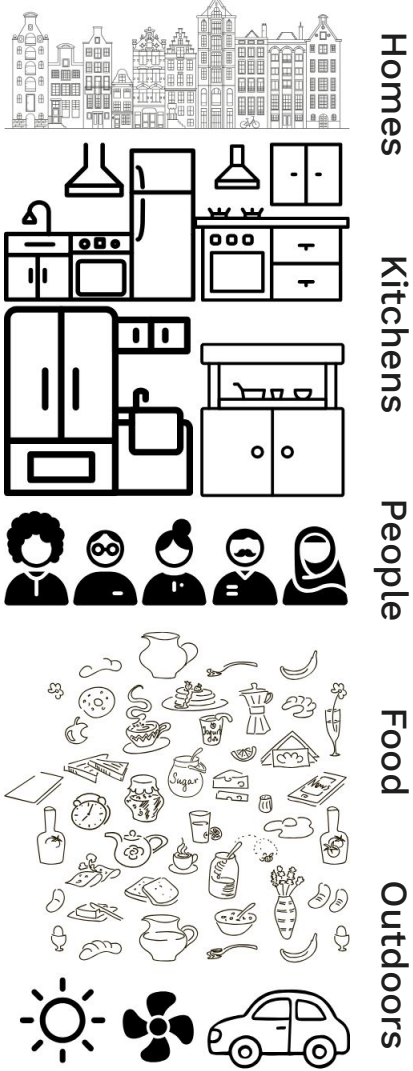
Hypothesis:

Switching from **gas** to **electric** cooking **reduces indoor air pollution** concentrations.

Null hypothesis:

Switching from **gas** to **electric** cooking **does not change indoor air pollution concentrations**.

Same homes = controlled variables



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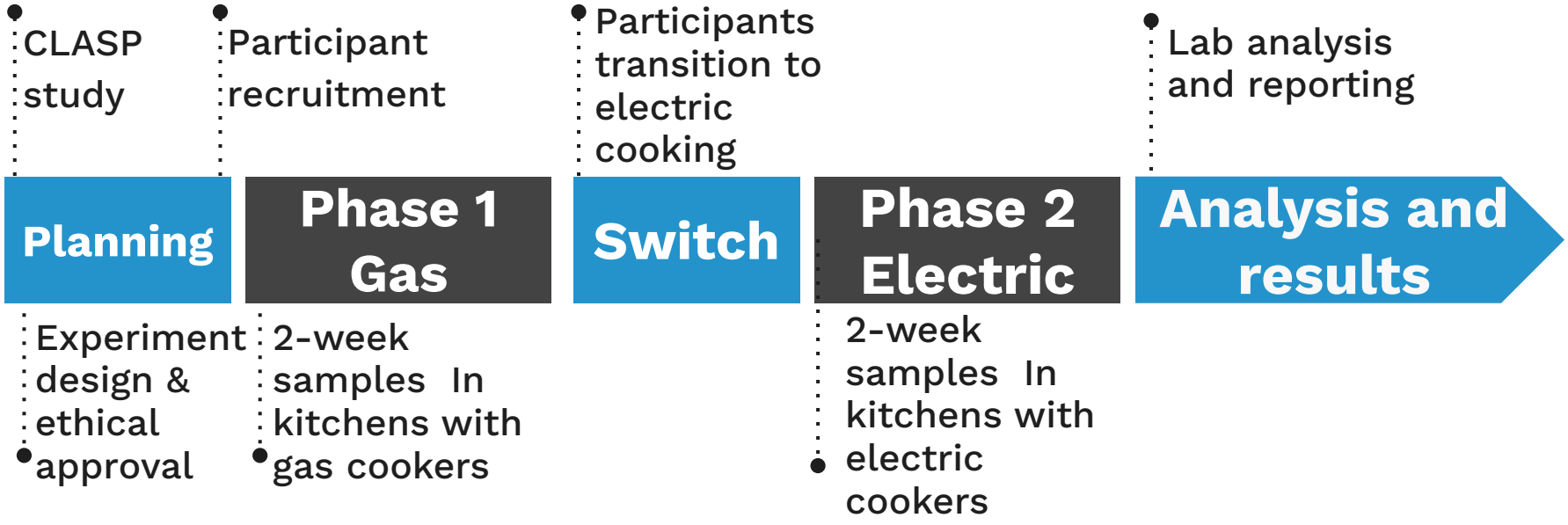
Project timeline



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Participants

9 in Croatia
3 in Hungary

Household criteria

- **Cooked with gas**
- **Transition to electric**
- **Uses the cooker most days**
  (Minimum 4 days per week)

- No **solid fuel burning**
- No **smokers**
- No **incense or candles**
- No **busy roads**
- No **industry or petrol stations**

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Budapest
Klenovnik
Čakovec
Pécs
Rijeka
Koprivnica
Osijek
Zagreb
Visnjevac
0
100
200 km

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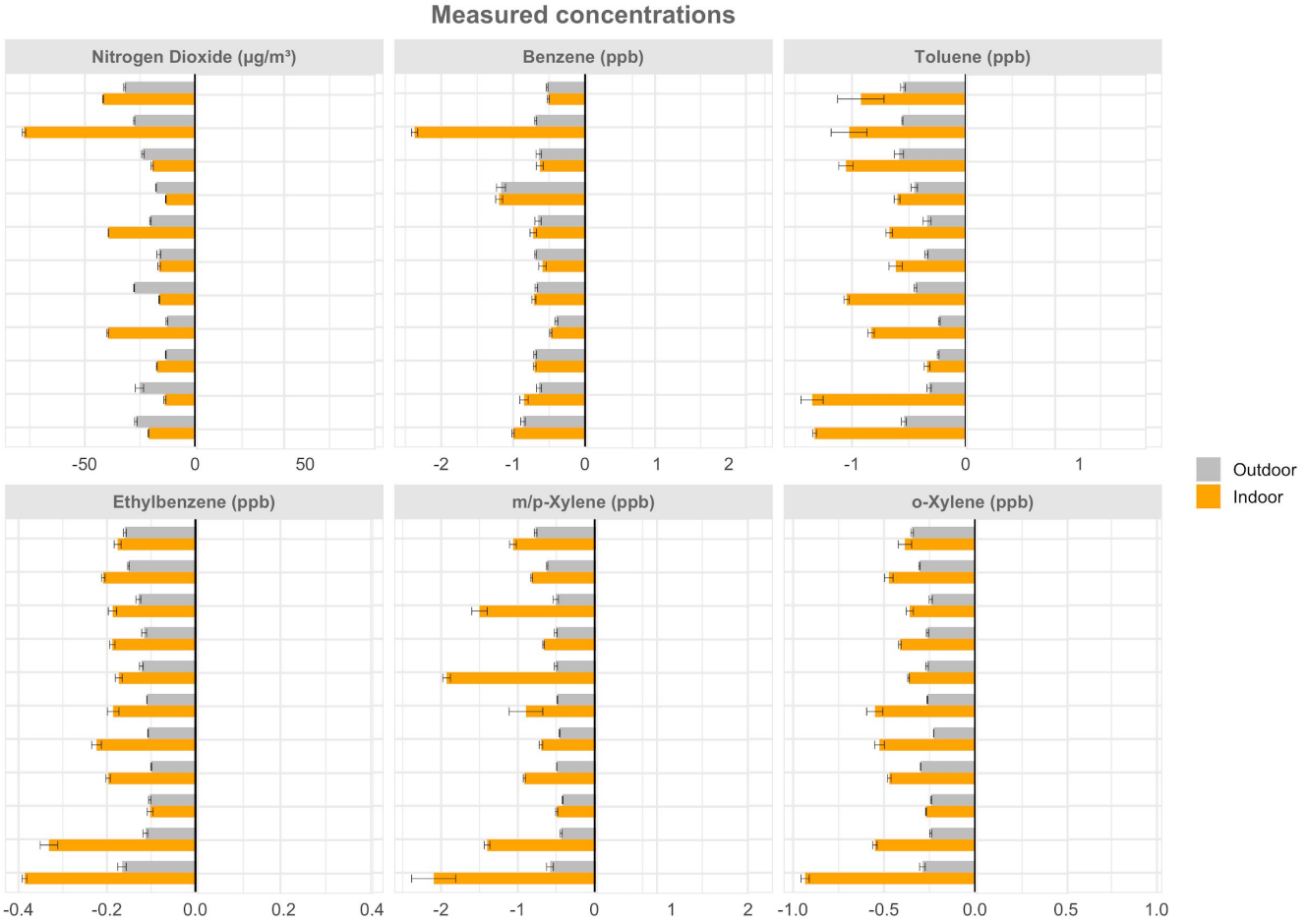
Results



Air Concentration
Indoor
Outdoor

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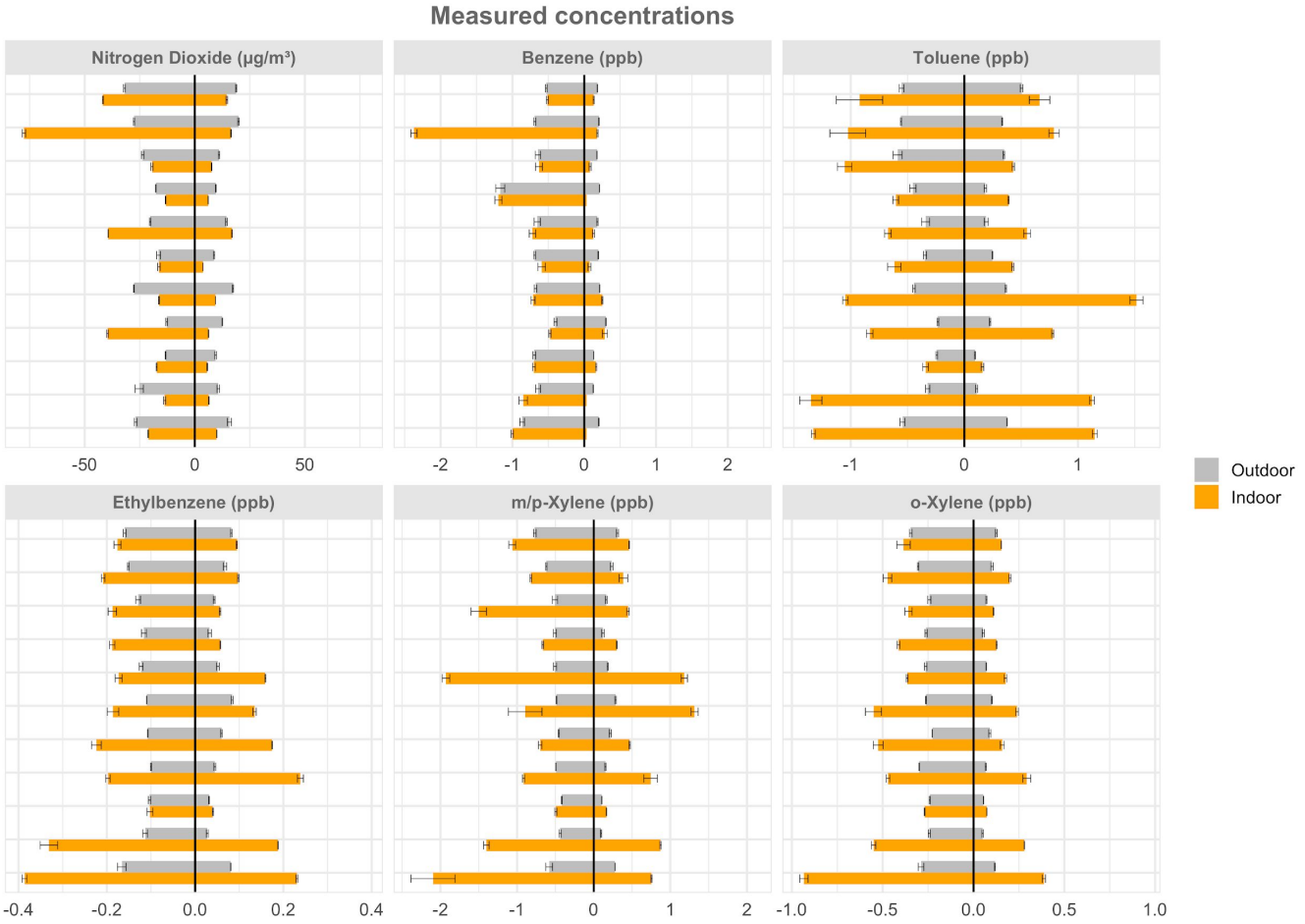
Results



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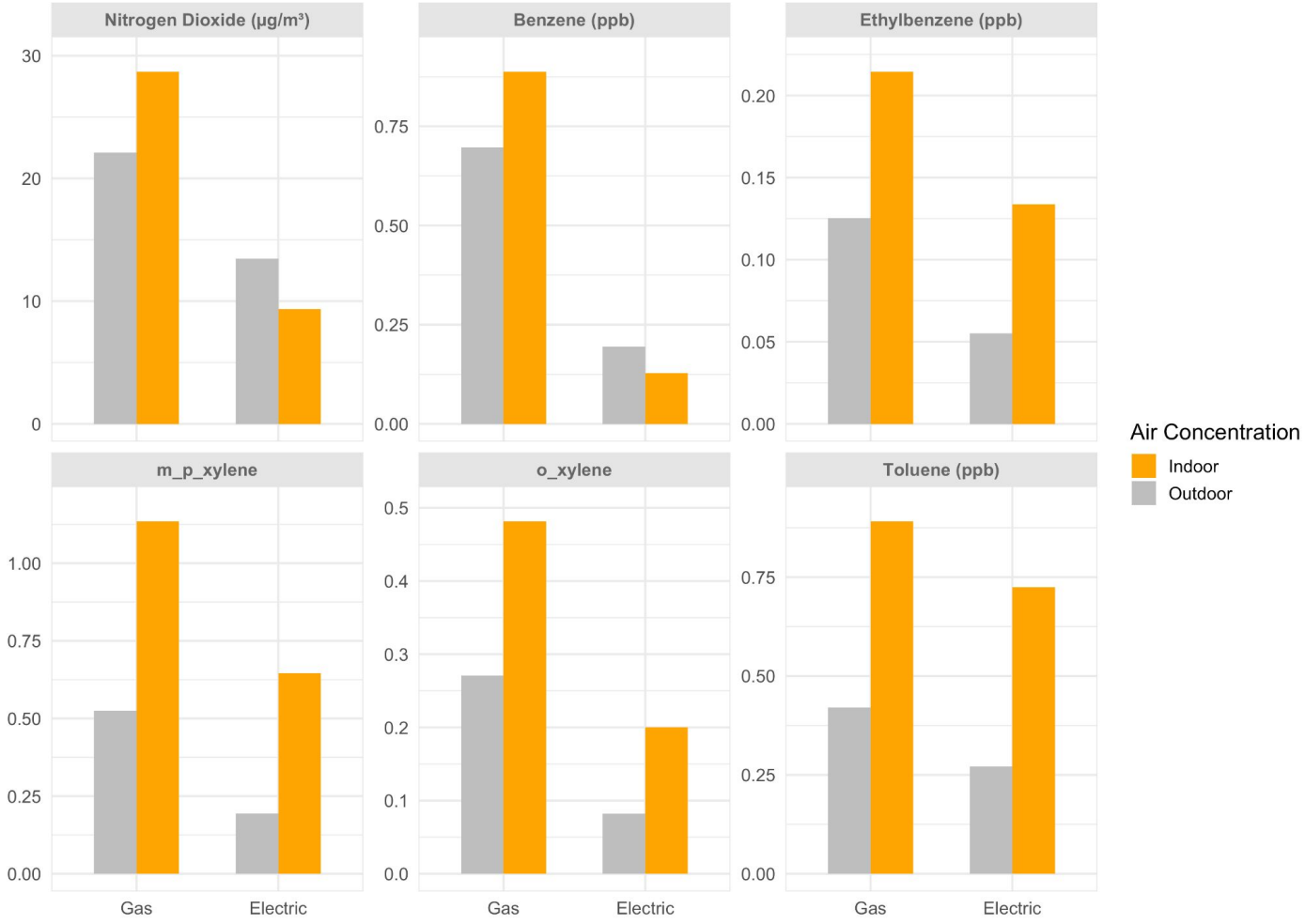
Results



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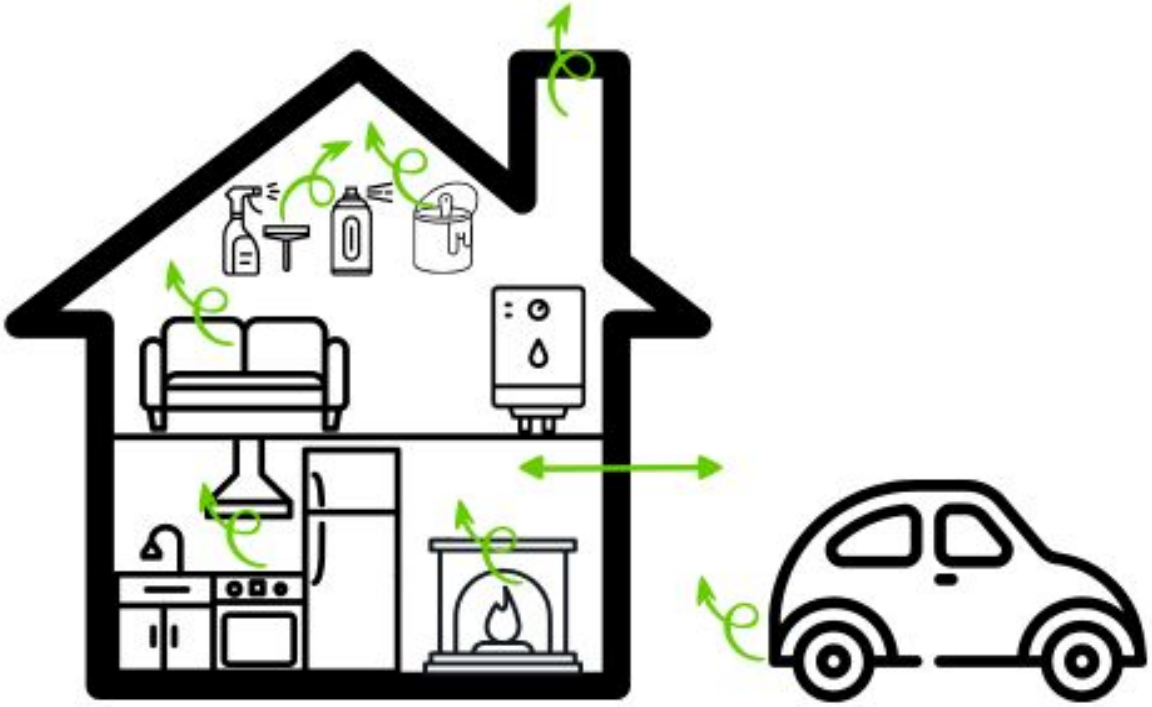
Indoor – Outdoor Model



“*indoor-modelled* concentration”

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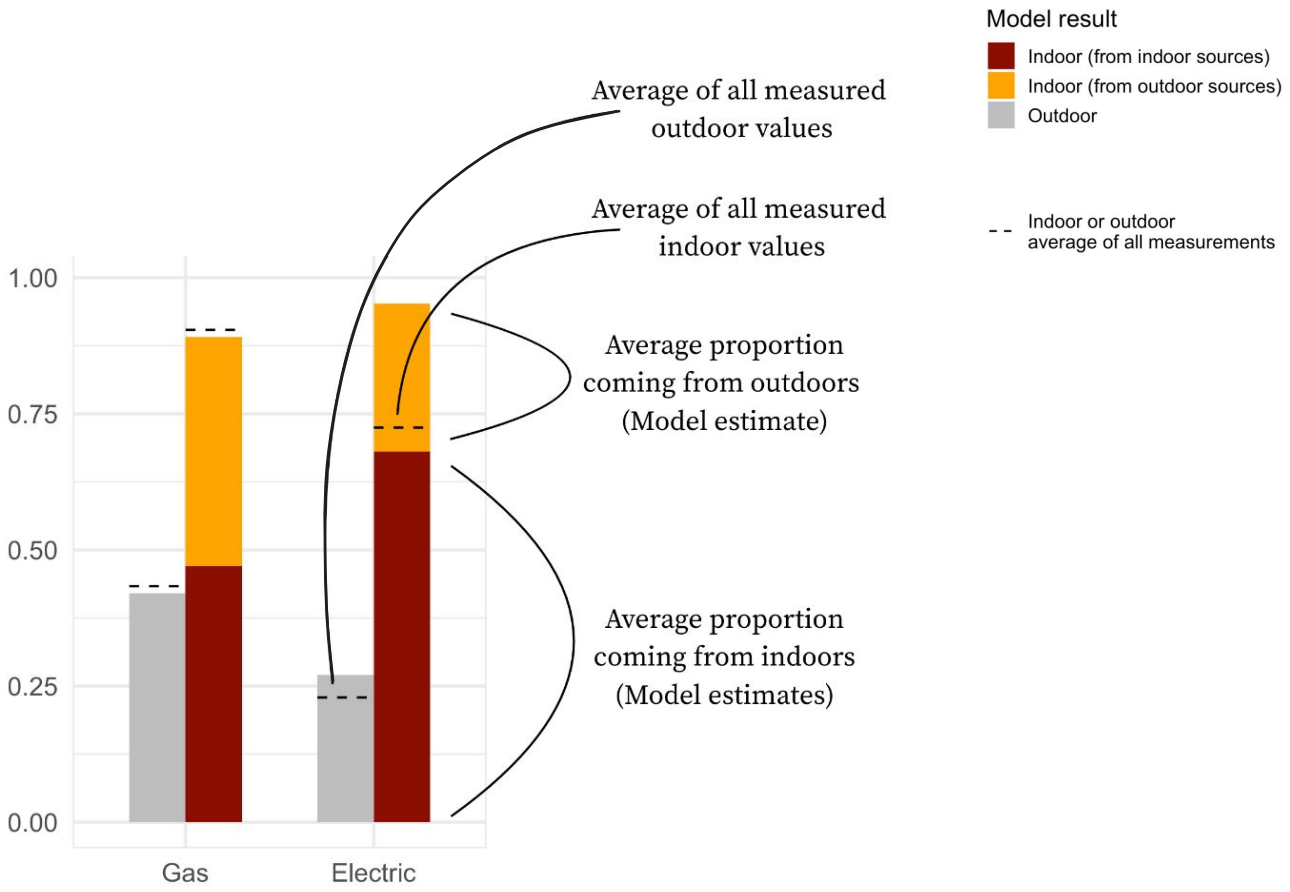
Model Results



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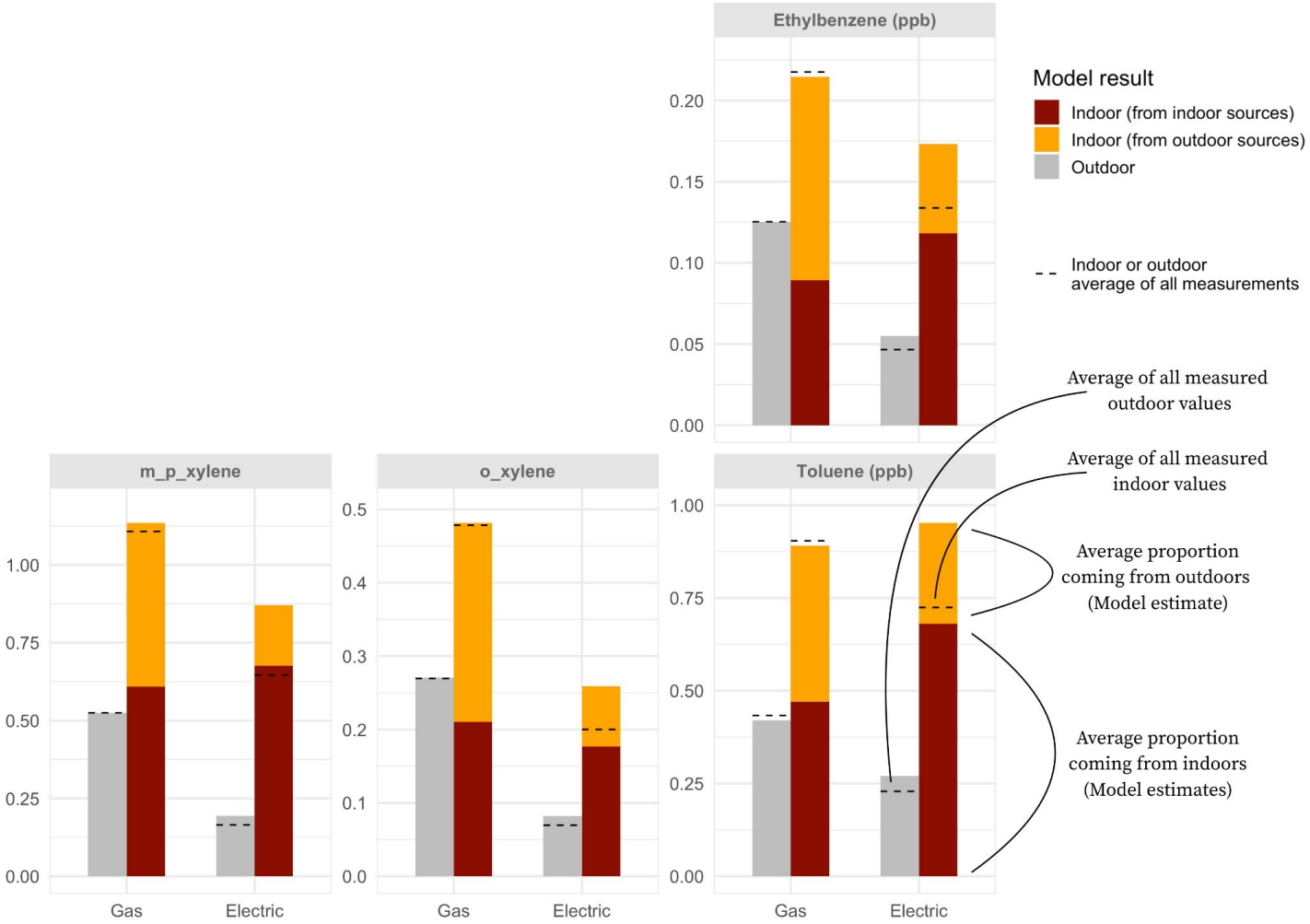
Model Results



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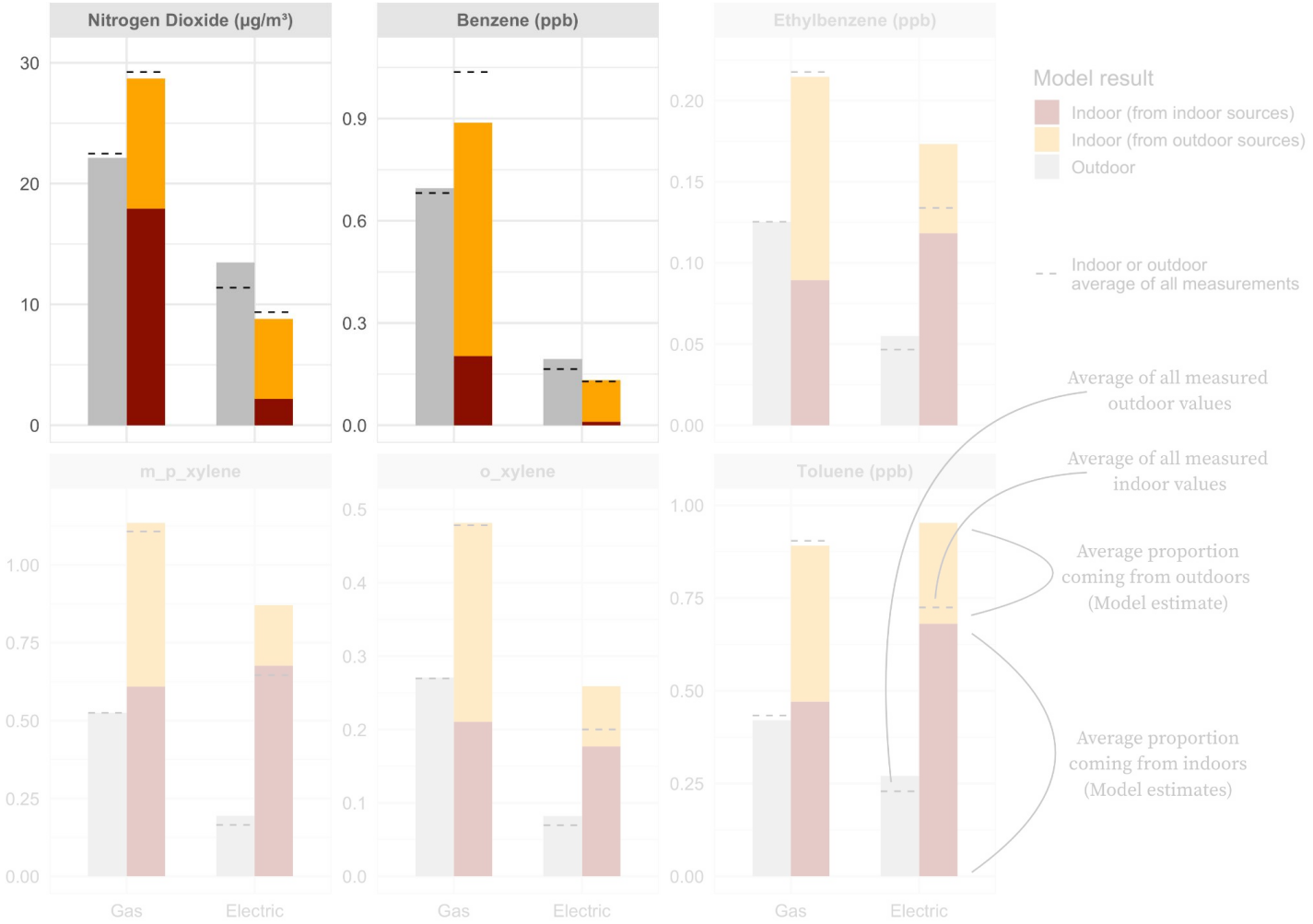
Model Results



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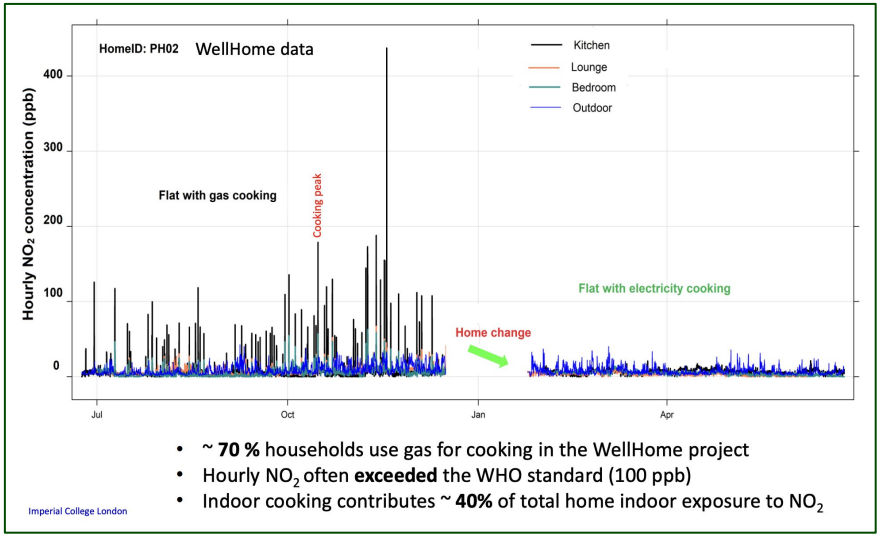
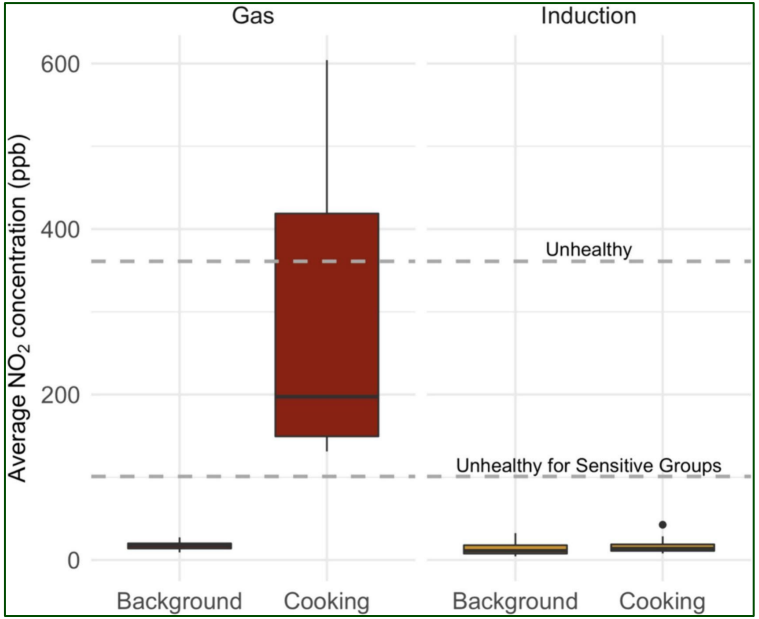
Related studies



- ~ **70 %** households use gas for cooking in the WellHome project
- Hourly NO_2 often **exceeded** the WHO standard (100 ppb)
- Indoor cooking contributes ~ **40%** of total home indoor exposure to NO_2

Imperial College London



Energy Research & Social Science

Out of Gas, In with Justice: Findings from a gas-to-induction pilot in low-income housing in NYC

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Summary

~90% of time indoors

Cooking and gas create air pollution

WHO guidelines can be exceeded.

Switching from gas to electric

- Lowered NO_2
- Lowered Benzene
- Provided healthier air.

When homes used electric:

NO_2 and Benzene lower in all homes.

Benzene was not always detected.

When we modelled indoor pollution:

NO_2 lower in all homes.
-90% average

Benzene lower in 9 of 12 homes

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Solutions

Support

→ Finance to replace gas stoves

→ Priority to vulnerable groups, low-income, poorly ventilated or overcrowded homes

Prohibit

→ new build residential gas stoves

Regulate

→ indoor air quality or emission standards

Next steps

Sign

→ open letter; **No to fossil fuels, yes to renewables!**

→ *Ban new EU fossil fuel projects*

→ *Stop public investments in fossil fuel projects.*

→ *Fair phase out fossil fuels, including a gas phase-out by 2035.*

Read the report

→ **www.greenpeace.hu/gas**

Learn more about Greenpeace

→ **www.greenpeace.org**

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Thank you

Dr Aidan Farrow
afarrow@greenpeace.org
Greenpeace Research Laboratories
University of Exeter, UK

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