Scaling housing interventions for wood-burning stoves worldwide

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SCALLING HOUSE INTERVENTIONS FOR WOOD-BURNING STOVES WORLDWIDE

HOUSEHOLD AIR POLLUTION AND RISK ASSESSMENT
ENVIRONMENT AND HEALTH, BASEL, AUGUST 2013

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Domestic biomass combustion worldwide

We know that biomass burning can be carbon neutral when using dry local biomass performing lightning from top to down and operating the stove with primary and secondary air to burn volatile organic compounds

A global issue…

Human health
Epidemological studies
Associated to human exposure to air pollutants

Health of the globe

- ***Desforestation***
- ***Energy consumption***
- ***Air pollution/ climate change***

Causes of inefficient biomass combustion

(large increase on solid-fuel burning during the last years)

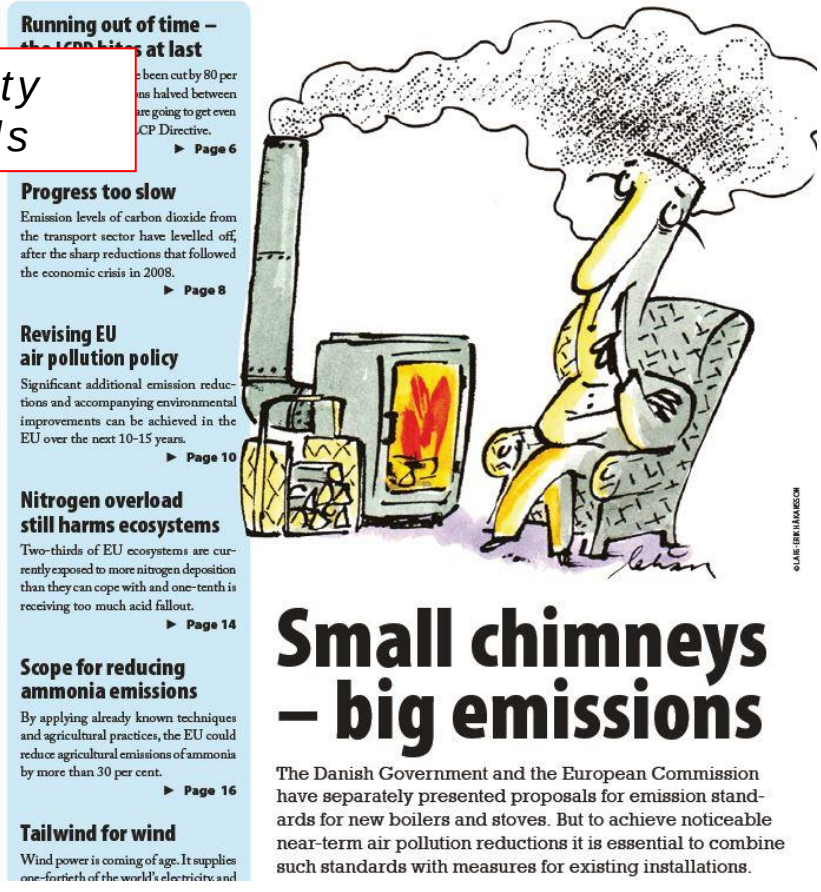
Impacting on biodiversity

Low quality solid-fuels

Air pollution due to inadequate operation

Indoor confort

*Impacts on human health, there is a global issue of **climate change***



Running out of time – the LCPD bites at last

...been cut by 80 per ...ns halved between ...are going to get even ...CP Directive.

► Page 6

Progress too slow

Emission levels of carbon dioxide from the transport sector have levelled off, after the sharp reductions that followed the economic crisis in 2008.

► Page 8

Revising EU air pollution policy

Significant additional emission reductions and accompanying environmental improvements can be achieved in the EU over the next 10-15 years.

► Page 10

Nitrogen overload still harms ecosystems

Two-thirds of EU ecosystems are currently exposed to more nitrogen deposition than they can cope with and one-tenth is receiving too much acid fallout.

► Page 14

Scope for reducing ammonia emissions

By applying already known techniques and agricultural practices, the EU could reduce agricultural emissions of ammonia by more than 30 per cent.

► Page 16

Tailwind for wind

Wind power is coming of age. It supplies one-fortieth of the world's electricity and

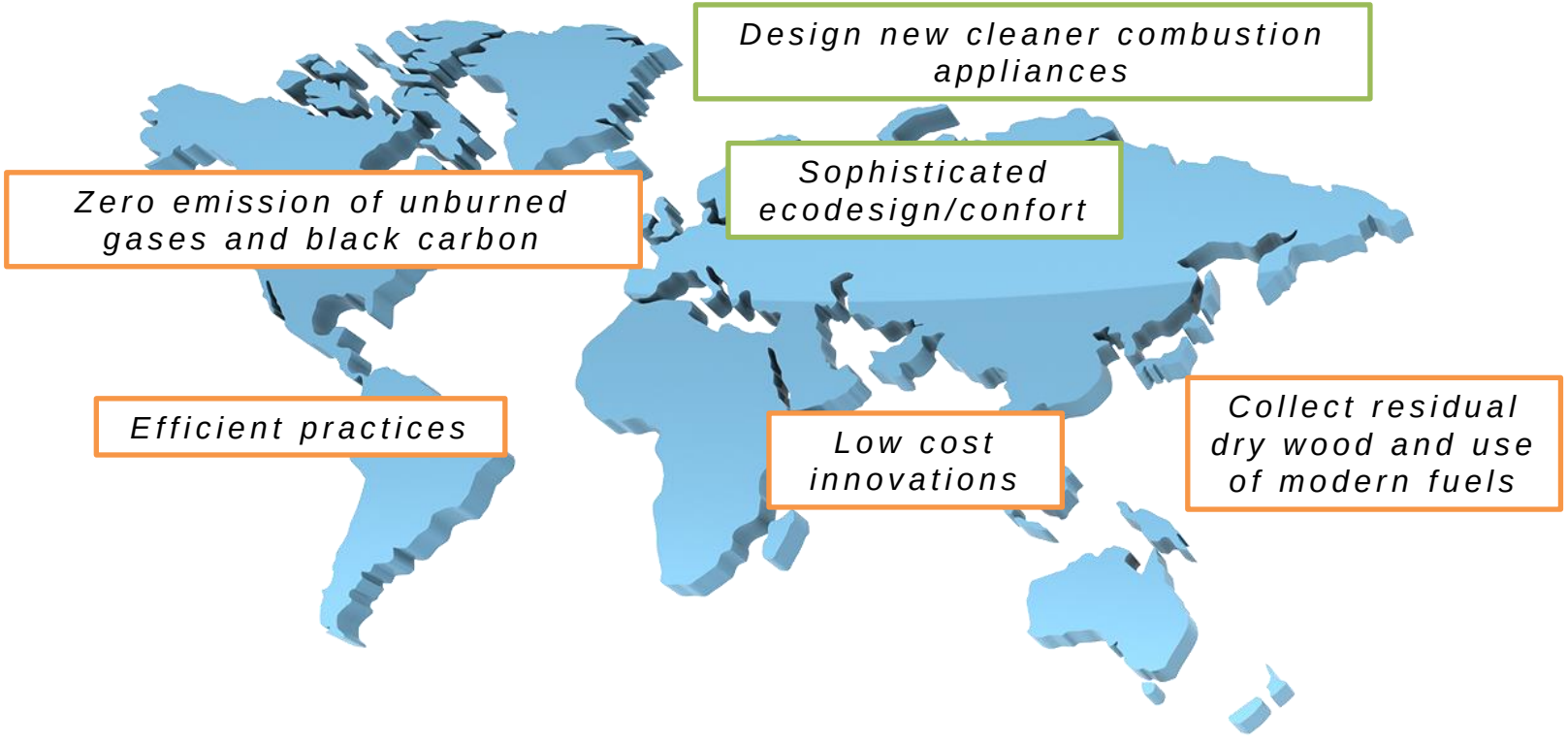
©LARS-ERIK HÅKANSSON

Small chimneys – big emissions

The Danish Government and the European Commission have separately presented proposals for emission standards for new boilers and stoves. But to achieve noticeable near-term air pollution reductions it is essential to combine such standards with measures for existing installations.

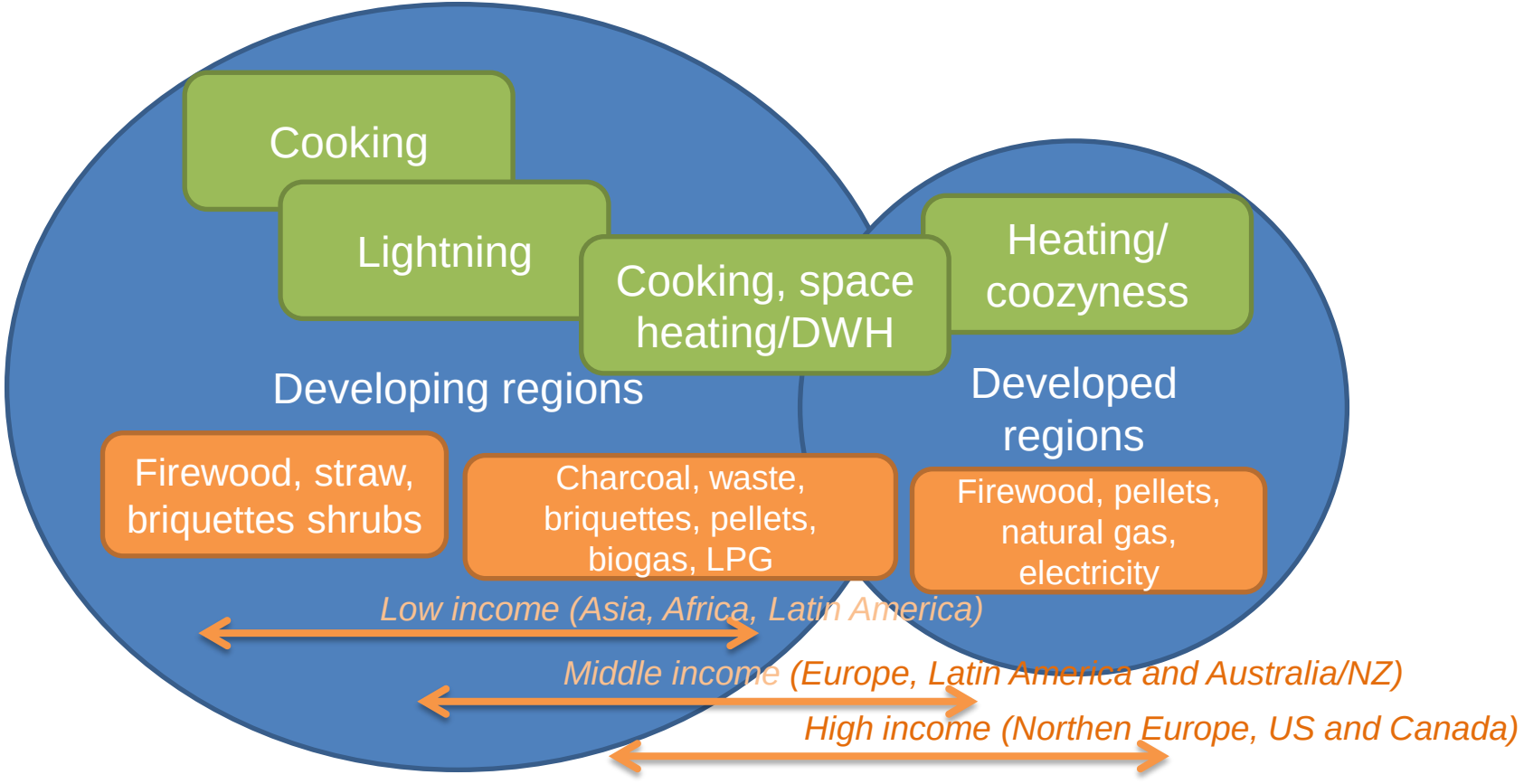
Air Pollution & Climate Secretariat, 2013

Appropriate domestic biomass use:
What are the potential measures for GHGs mitigation?



Danish Building Research Institute, 2012

Practices and solid fuels worldwide



Overheating in low energy houses

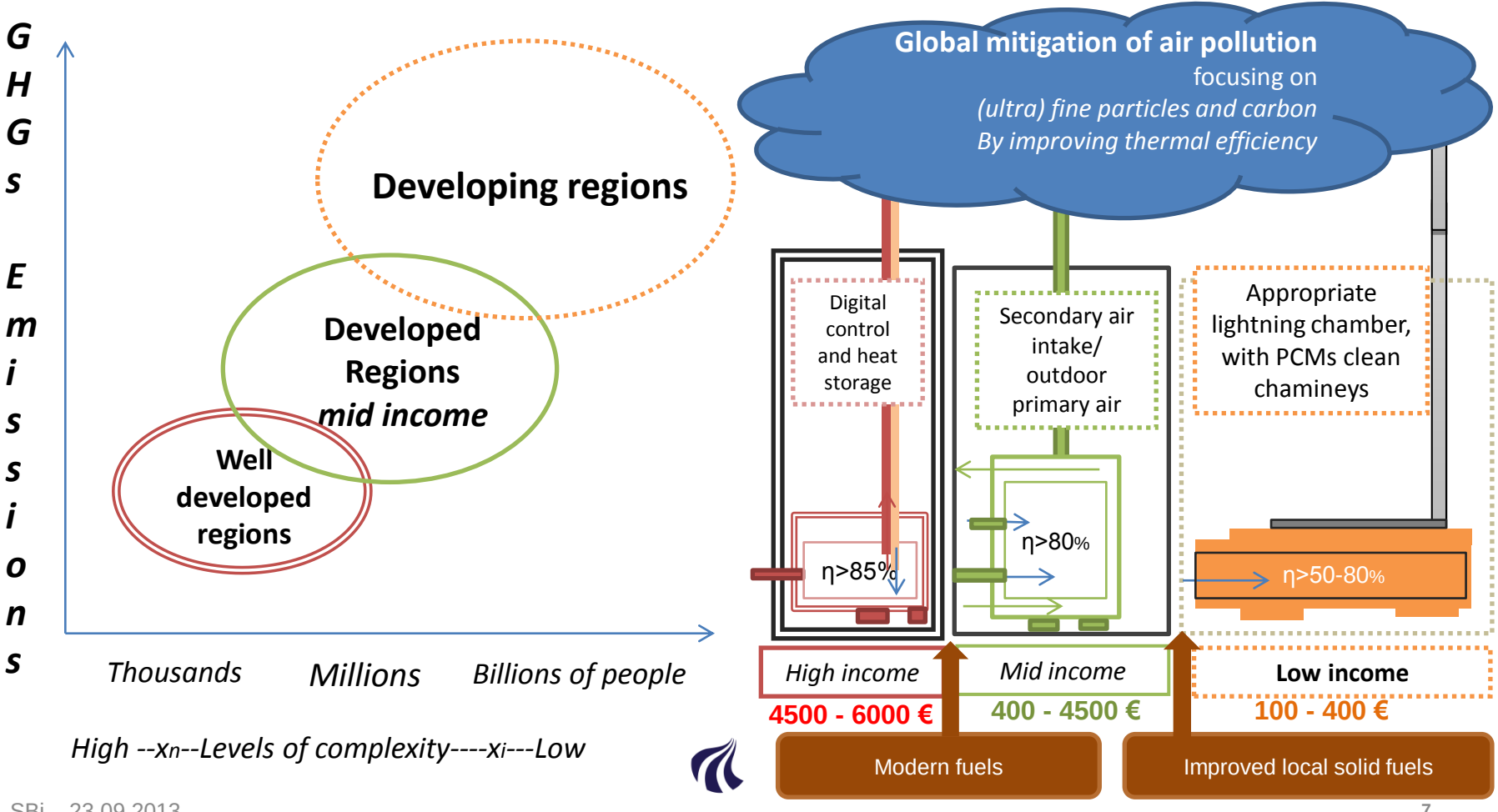
new biomass stoves and EU labelling

Heating requirement (kW) for at sitting room at 50 m^2

Outdoor temperature (kW)	BR 1961	BR 1977	BR 1985	BR 1995	BR 2006	BR 2010
10 °C	2,1	1,9	1,3	1,3	1,2	1,0
5 °C	3,1	2,8	1,9	1,9	1,8	1,5
0 °C	4,2	3,7	2,5	2,6	2,3	2,0
-5 °C	5,2	4,7	3,1	3,2	2,9	2,5
-10°C	6,2	5,6	3,8	3,8	3,5	3,0

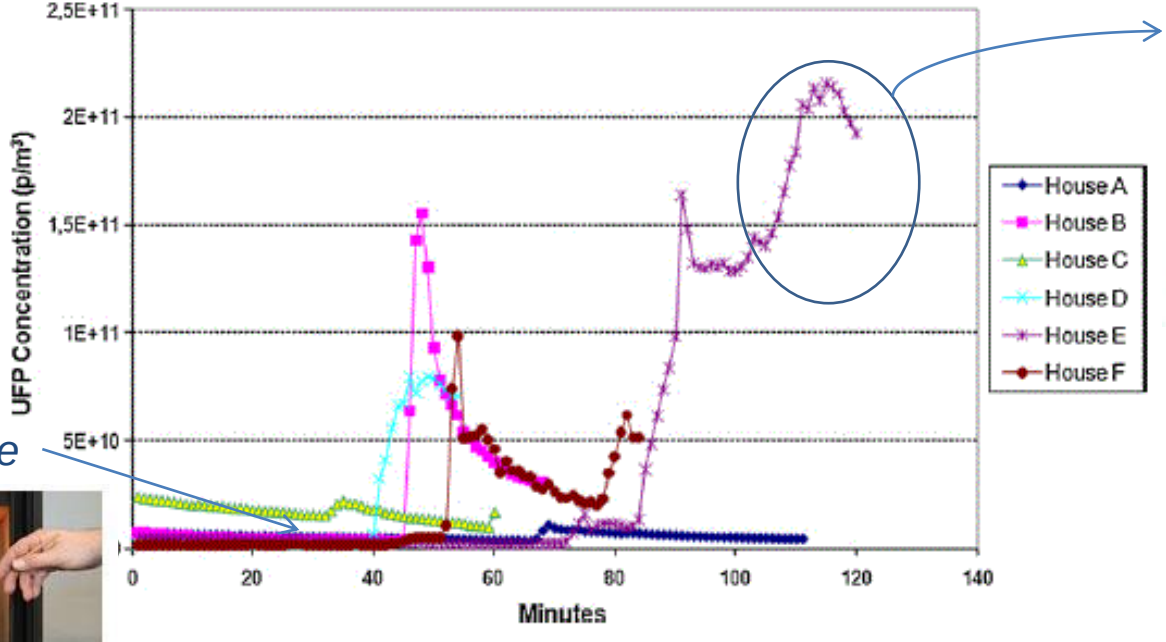
Ole M. Jensen et al. Danish Building Research Institute, 2012

Magnitude of interventions in dwellings?



Indoor climate measurements in low energy houses

guidance to scalling household interventions



Afshari, A. et al., 2011

Lightning stove

Operating manually

Energy savings
Fine particle mitigation

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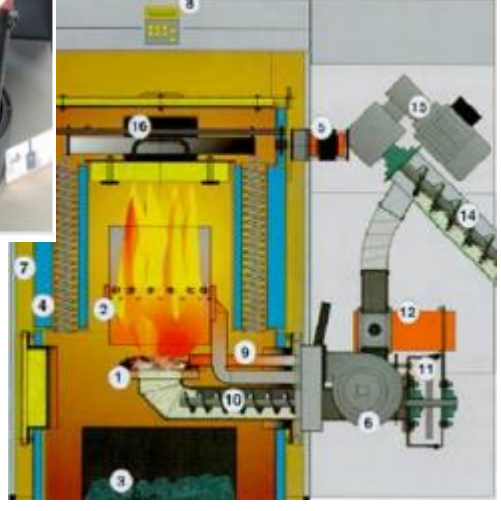
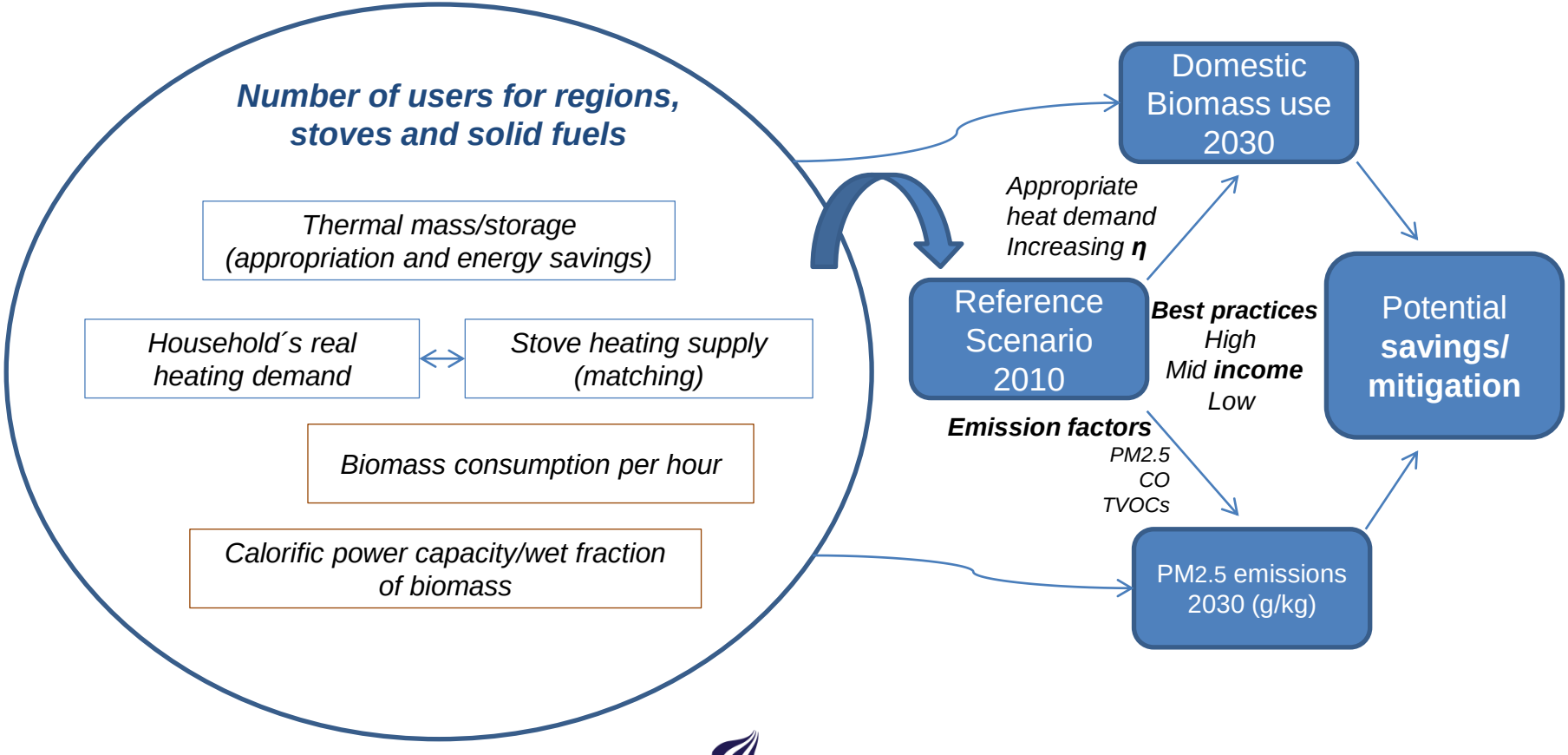
Testing efficient cooking stoves (Latin America)

Improved cooking stove Nina (Peru) have a thermal efficiency of 30% and new efficient wood cooking stove IDER (Brazil) saves 40% of solid-fuels

Cataloging stoves in Latin America and Europe

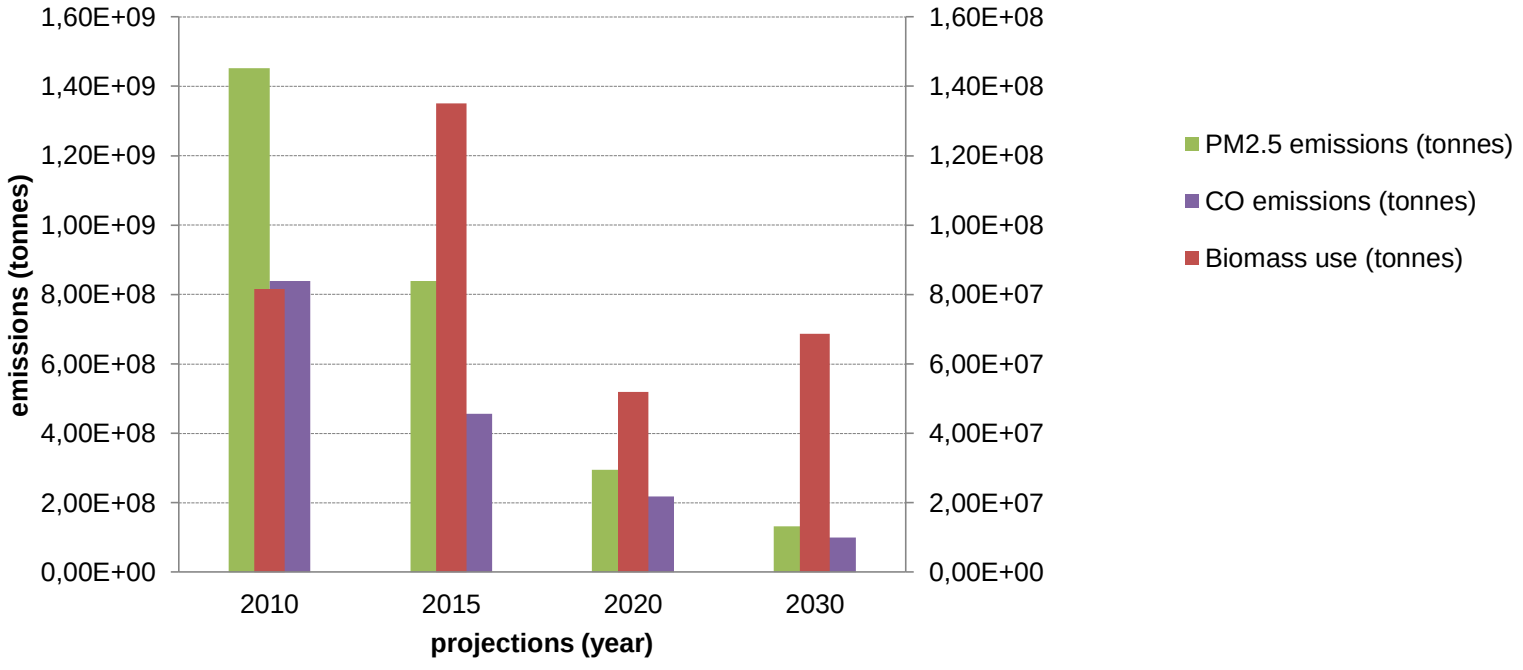


Methodology for modelling mitigation measures impact



Modelling/estimations energy savings and $PM_{2.5}$ emissions EU27 *(work in progress…)*

Scenario A: stable

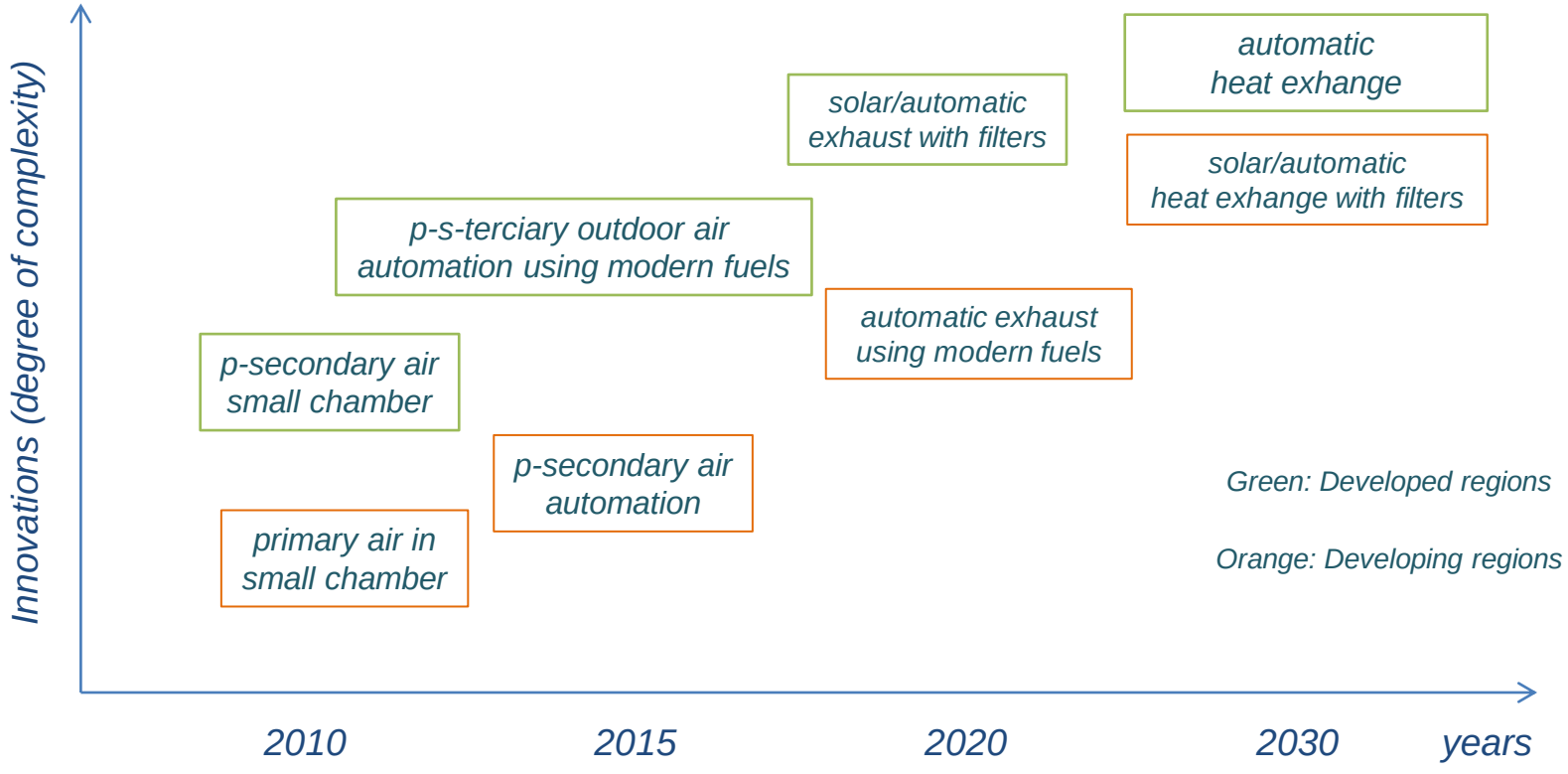


Modelling/estimations energy savings and $PM_{2.5}$ emissions in Latin America *(work in progress…)??*

Ricardo L.T. Carvalho

Scale up-grading biomass stoves until 2030

big changes with low cost innovations?



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QUESTIONS?

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