BUILDINGS
FOR THE FUTURE

SMOG, LOW INCOME AND HOUSING

15/06/2018

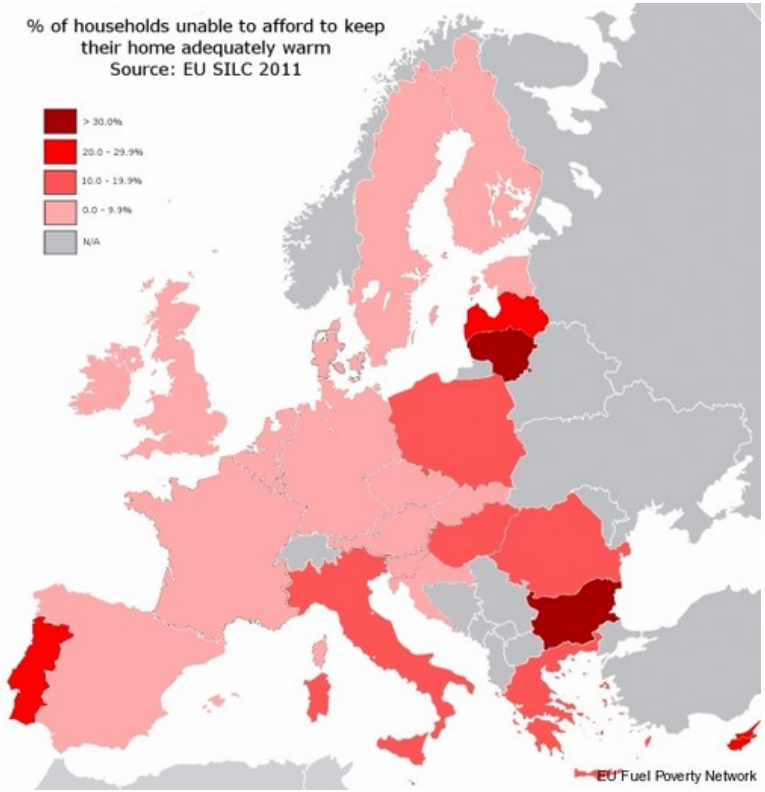
Priorities 2018 - 2019

- Energy performance certificates and permitting
- Innovation and beyond minimum requirements
- Public buildings renovation after 2020
- **Low income housing / rental housing**
- EPBD, EED, etc.

Energy poverty in Slovakia

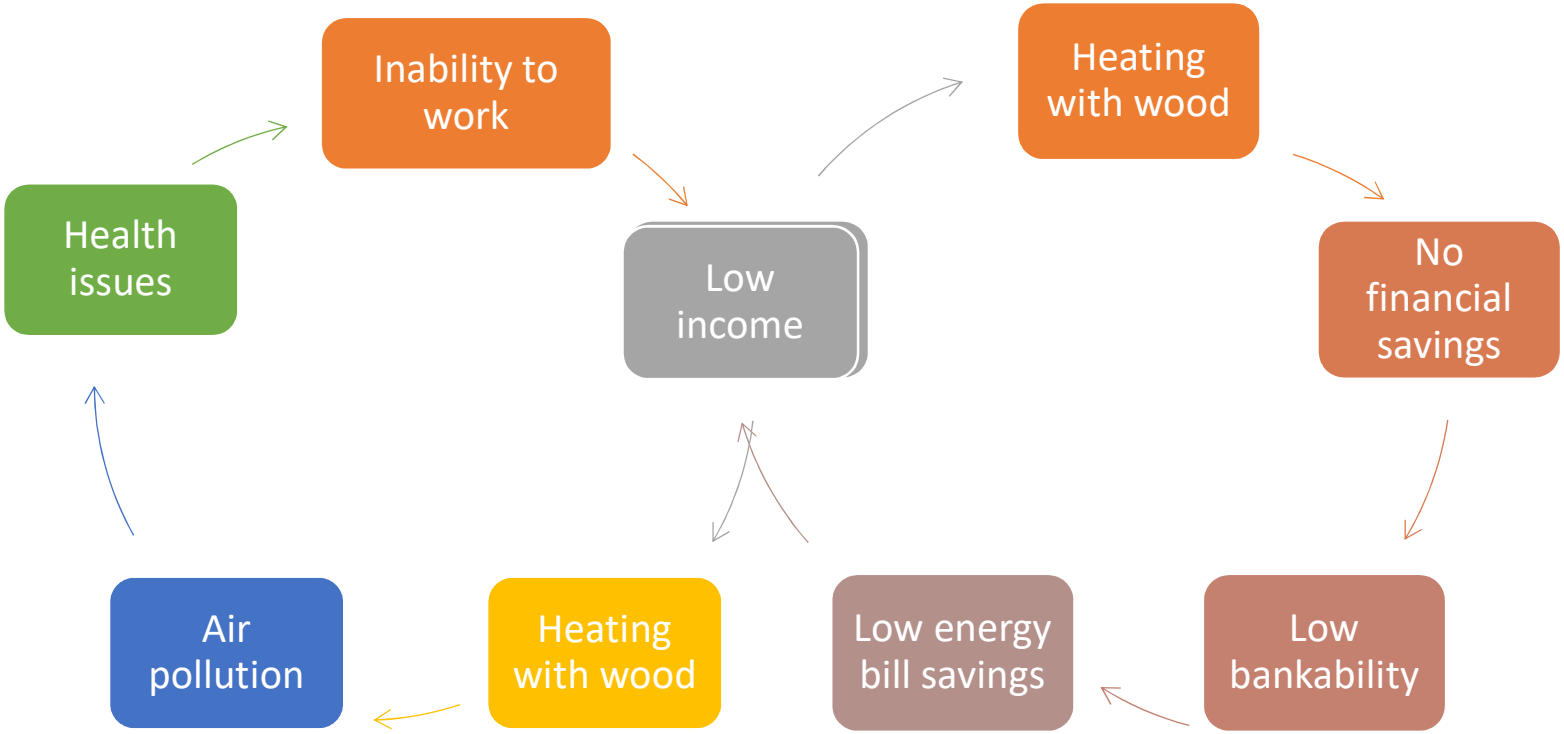
- 10 – 20 % of households at risk of energy poverty
- 15 – 25 % of households with leakages / damp walls
- No energy poverty or housing aid
- Public support of social rental housing

- 1/5 of population with monthly income < 300 EUR
- > 3 thousand premature deaths due to air pollution caused by heating homes with solid fuels
- Ageing : 65+ population will double until 2050

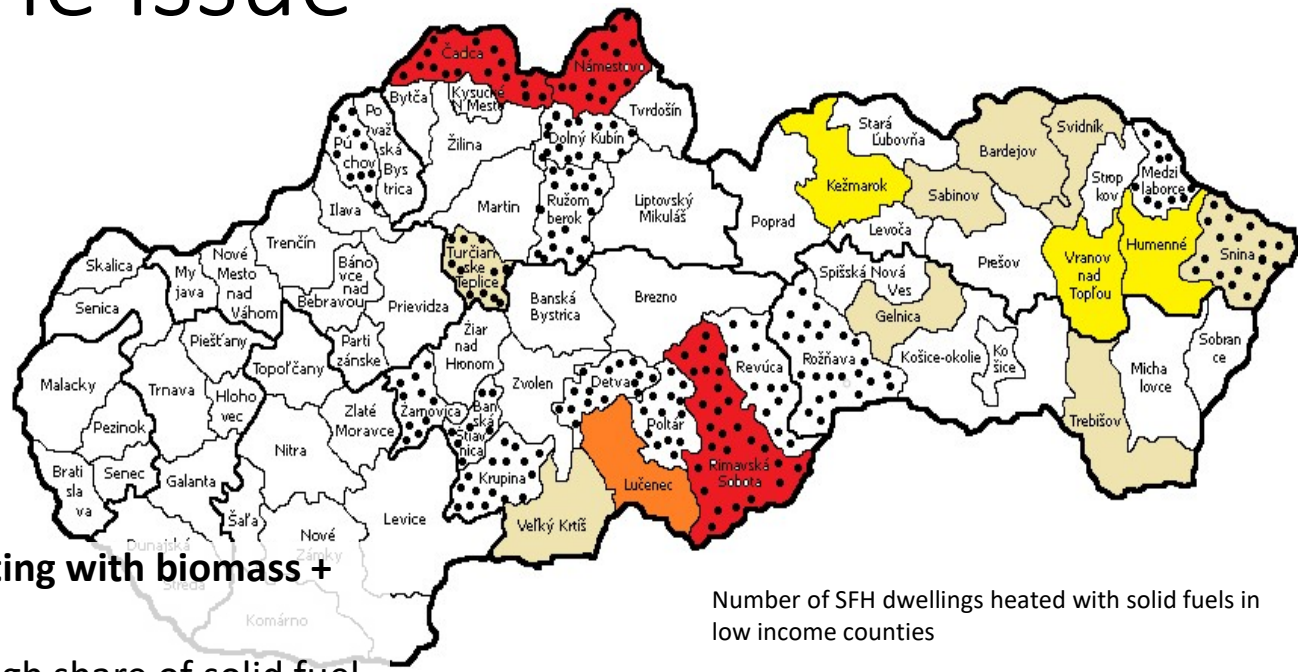


Unable to invest in their existing homes or buy new flats in regions with job opportunities, these households are today excluded from the residential market and trapped in unhealthy living conditions.

Vicious circles



Size of the issue



Number of SFH dwellings heated with solid fuels in low income counties

- 8000 – 9000
- 4800 – 6400
- 3200 – 4800
- 1600 – 3200
- Counties with high share of solid fuels

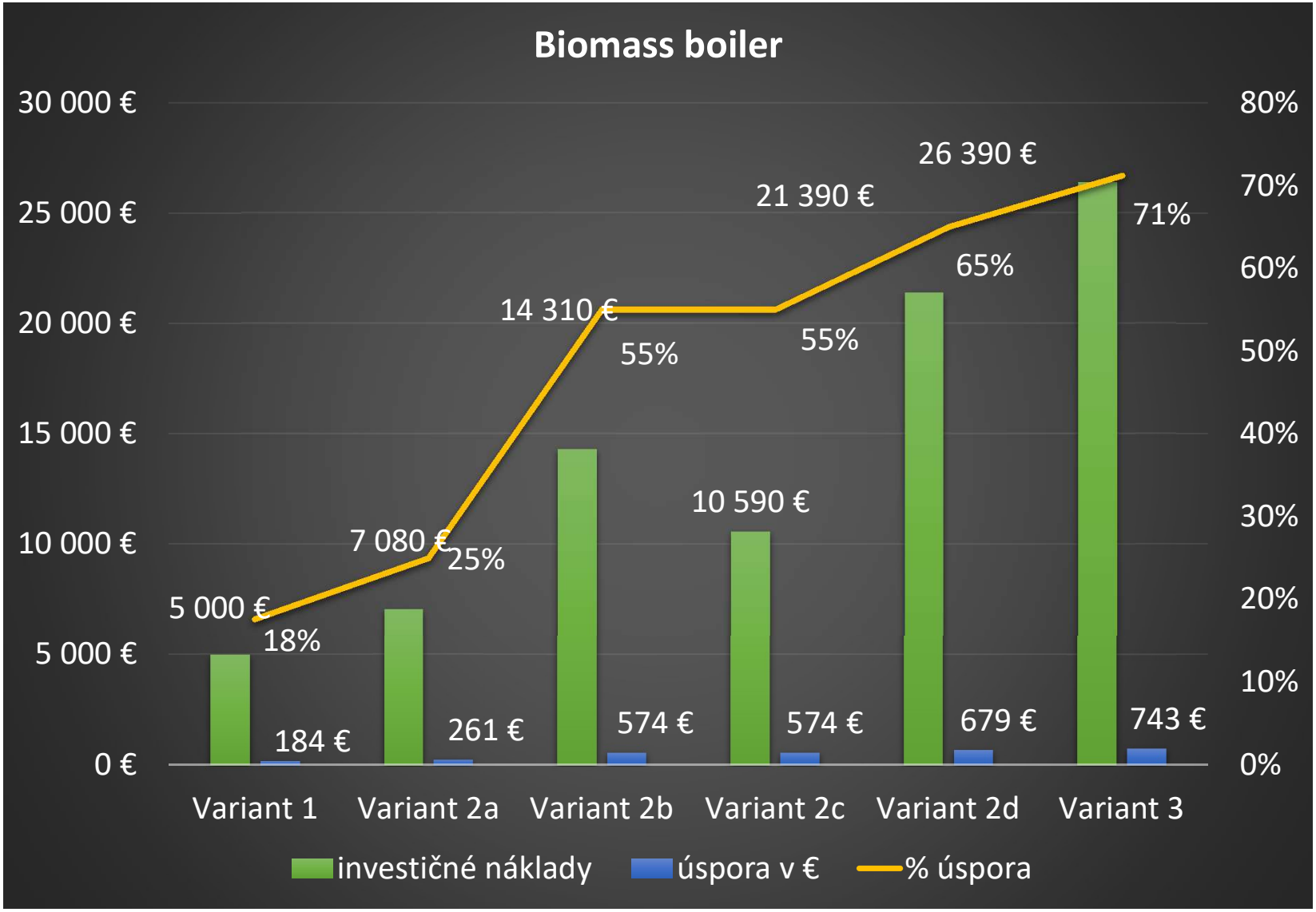
- **Low income + heating with biomass + smog geography**
- **25 counties** with high share of solid fuel heating (> 30 % of SFH), low income and smog situations.
- The situation is worst in case of **63 thousand households** in SFH in Southern, Northern and Eastern part of the country.
- About 1/4 of SFH heat with solid fuels in Slovakia, i.e. **250 thousand homes**.

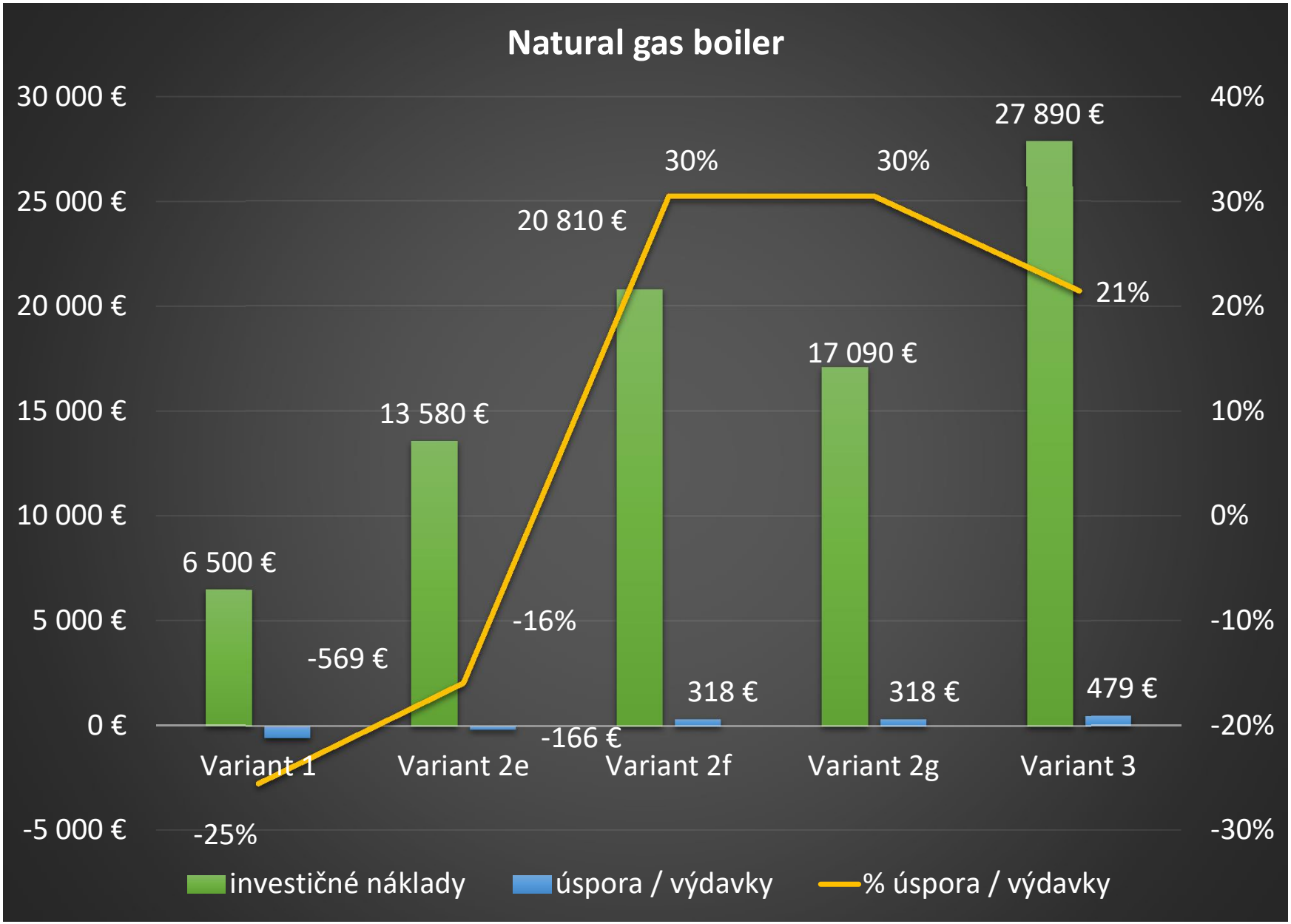
Renovation scenarios

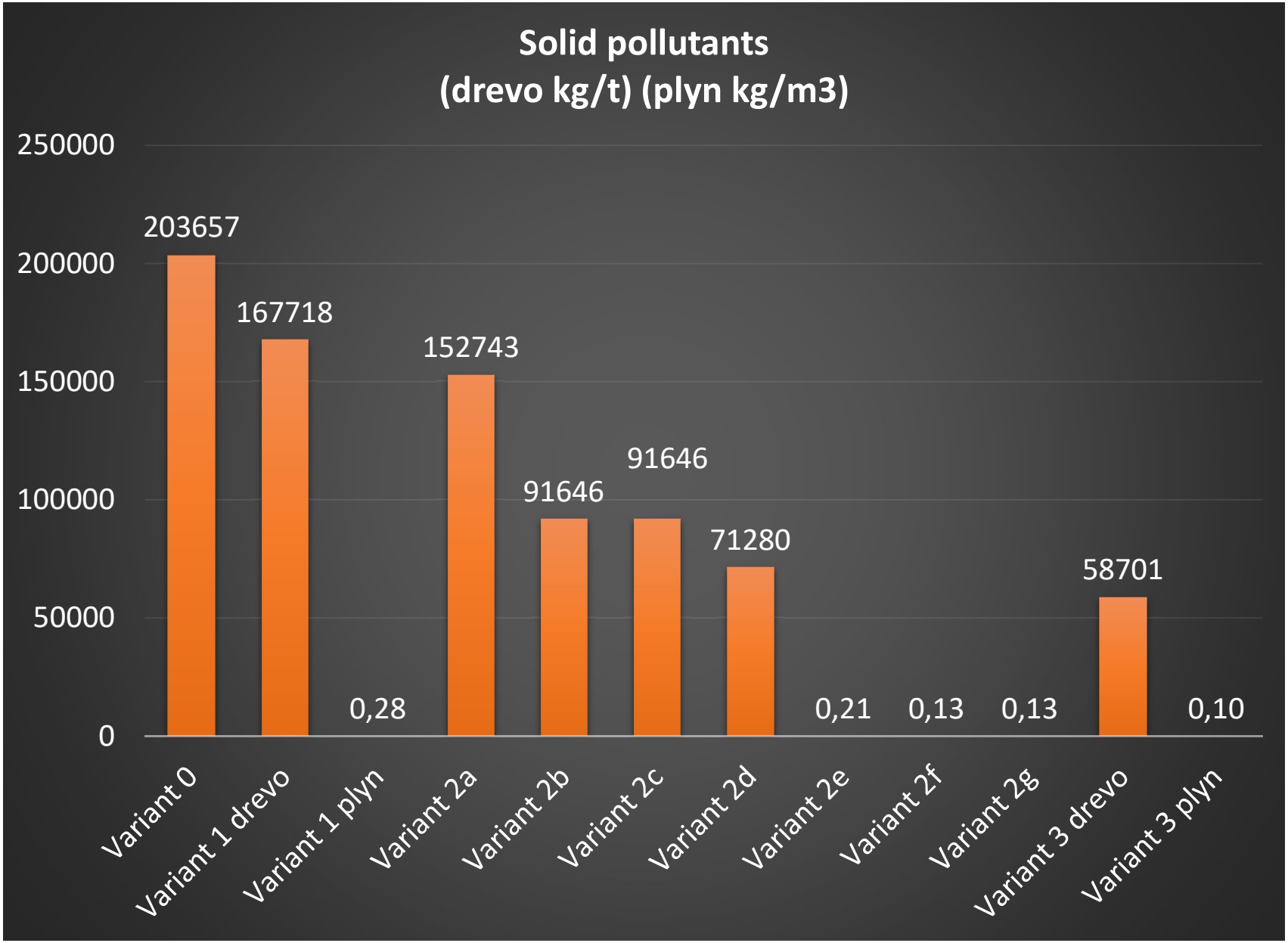
- **Investment efficiency vs. owner‘s decision:**
  - Maximum emission reduction per EUR invested
  - Investment and running cost within reach.

- **Low cost scenario:**
  New high efficiency biomass boiler
  25 % emission reduction
- **Absolute emission scenario**
  New natural gas boiler
  Higher energy bill without insulation
- **Efficient scenario**
  original / new biomass boiler + insulation (roof & windows)
  Halving emissions

Scenario	Original biomass boiler	New biomass boiler	New natural gas boiler	Roof insulation	Facade insulation	New windows & door	Reduction of solid pollutants in kg / 1 EUR investment
0	x						
1a		x					7,2
1b			x				31,3
2a	x			x			7,2
2b	x				x	x	7,8
2c	x			x		x	10,6
2d	x			x	x	x	6,2
2e			x	x			15,0
2f			x		x	x	9,8
2g			x	x		x	11,9
3a		x		x	x	x	5,5
3b			x	x	x	x	7,3


Biomass boiler
30 000 €
25 000 €
20 000 €
15 000 €
10 000 €
5 000 €
0 €
80%
70%
60%
50%
40%
30%
20%
10%
0%
5 000 €
18%
184 €
7 080 €
25%
261 €
14 310 €
55%
574 €
10 590 €
55%
574 €
21 390 €
65%
679 €
26 390 €
71%
743 €
Variant 1
Variant 2a
Variant 2b
Variant 2c
Variant 2d
Variant 3
investičné náklady
úspora v €
% úspora


Natural gas boiler
30 000 €
25 000 €
20 000 €
15 000 €
10 000 €
5 000 €
0 €
-5 000 €
40%
30%
20%
10%
0%
-10%
-20%
-30%
6 500 €
-569 €
13 580 €
-16%
20 810 €
30%
-166 €
318 €
17 090 €
30%
318 €
27 890 €
21%
479 €
-25%
Variant 1
Variant 2e
Variant 2f
Variant 2g
Variant 3
investičné náklady
úspora / výdavky
% úspora / výdavky


Solid pollutants
(drevo kg/t) (plyn kg/m3)
250000
200000
150000
100000
50000
0
203657
167718
0,28
152743
91646
91646
71280
0,21
0,13
0,13
58701
0,10
Variant 0
Variant 1 drevo
Variant 1 plyn
Variant 2a
Variant 2b
Variant 2c
Variant 2d
Variant 2e
Variant 2f
Variant 2g
Variant 3 drevo
Variant 3 plyn

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Public finance view

Policy with highest emission reduction per public spending

	New biomass boiler	Old boiler + insulation	Gas boiler + insulation
Investment cost / SFH (EUR)	5 000	10 590	17 900
Energy cost savings (EUR / a)	184	574	318
Subsidy (investment %)	80%	75%	90%
Number of renovated SFH / a	5 000	2 518	1 300
Emission reduction (kt / % regional / overall emissions)	250 kt	277 kt	260 kt
	25 %	50 %	100 %
	2 %	2 %	2 %

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Public policy options

- Boiler replacement
- Energy bills
- Renovation
- Relocation
- District biomass heating
- Other ...

Policy options pros / cons

- Focus on bills makes air pollution even worse
- Focus on heating aids bills and emissions, not housing quality
- Relocation and sustainable regions
- Renovation is costly, political consequences

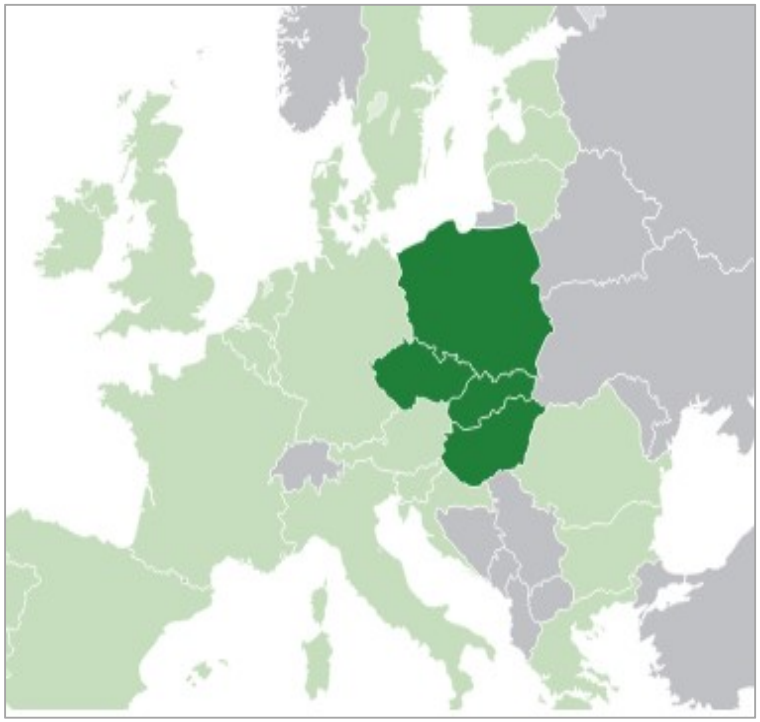
Challenges

- Aggregation of SFH projects to make a change
- Low income families and renovation projects etc.
- Social work / nudging / marketing
- Municipalities, banks, insulation, boiler, utility companies?

Policy case is there

On Visegrad level:

- 5,3 – 11,2 billion EUR a year in healthcare cost attributable to low quality of buildings
- 66,5 billion EUR in potential GDP increase due to better productivity in healthy buildings



Alleviating energy poverty by building renovation. Slovak 2050 buildings vision: demography, economics, air pollution and energy poverty

- High unemployment regions in Slovakia are more likely to motivate house owners to heat with cheap solid fuels. The energy poverty issue thus gets even worse due to air pollution. Add low income, therewith inability to invest into renovation and the vicious circle is complete. Boiler subsidies fail and so do normal renovation subsidies. How can we break the circle?

- Size of the issue: building stock, heating fuels, income levels, premature deaths and demography of the relevant geographic areas in Slovakia, societal cost.
- Examples of public programs – Czech Republic and Poland, pros and cons.
- Renovation or relocation?
- Modelling: various SFH renovation scenarios, their contribution to reducing energy poverty and air pollution and investment cost.
- Options for a public incentive program – success factors.

- Unable to invest in their existing homes or to buy new flats in regions with job opportunities, these households are today excluded from the residential market.