

# ECM

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## ECM Households: How to deal with no-regret measures?

Nele Renders, VITO, Belgium

### Outline ECM Households

- » Environmental Costing Model for Flanders
- » ECM Climate Households
  - » Model Structure
    - » Assumptions
    - » General structure in Markal
  - » Result: Marginal Abatement Cost Curve MAC
    - » How to deal with no-regret measures?
    - » Result: Marginal Abatement Cost Curve 2020
- » Conclusion

Focus of  
presentation

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## Environmental Costing Model for Flanders

- » Bottom-up, techno-economic Markal model
- » Sectors:
  - » Energy
  - » Industry
  - » Residential & Service sector
  - » Agriculture
  - » Transport
- ➔ Cross-sectoral optimization
- » Emissions
  - » GHG: CO<sub>2</sub>, N<sub>2</sub>O, CH<sub>4</sub>, F-gases
  - » Air pollutants: SO<sub>2</sub>, NO<sub>x</sub>, VOC, PM (TSP, 10 & 2,5)
- ➔ Multi-pollutant optimization

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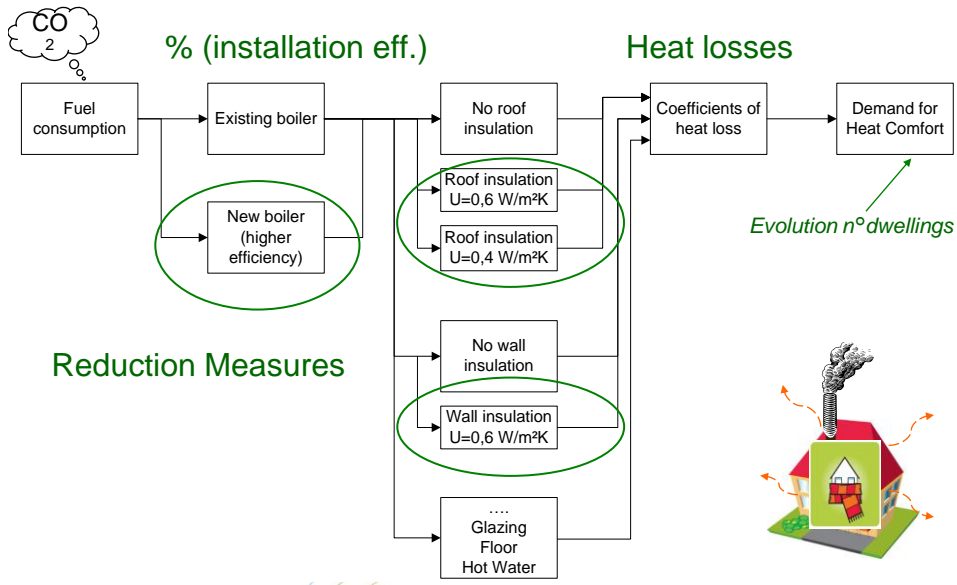
→ **ECM Climate Households**

**Energy use for heating and domestic hot water**

## Model Structure: Assumptions

- » Costs?
  - » Costs of reduction measures: investment and operational costs excl. taxes, subsidies
  - » Energy prices: POLES model + distribution costs
  - » Discount rate: 4%
- » Optimization period:
  - » 2005-2030, 5 years periods
  - » Results: focus on 2020

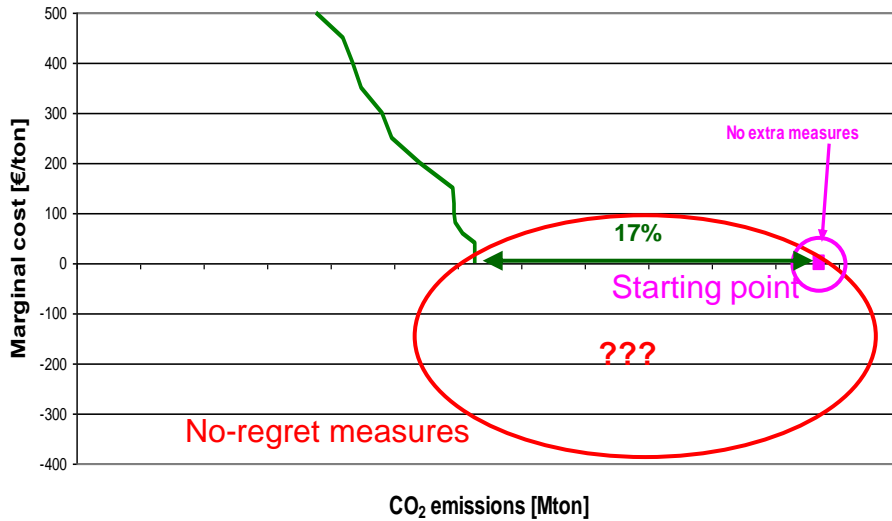
## Model Structure in Markal



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    - » Assumptions
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    - » **Result: Marginal Abatement Cost Curve MAC**
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## How to deal with no-regret measures? MAC 2020



## How to deal with no-regret measures?

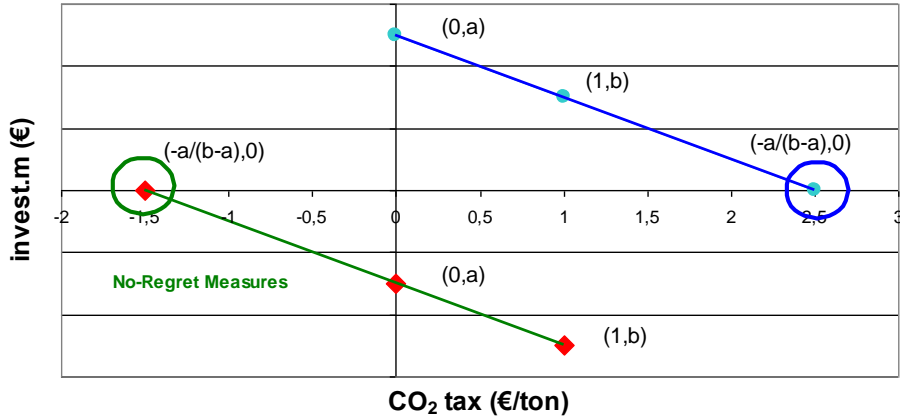
- » Trajectory of the MAC below zero?
  - » Which are those no-regret measures?
  - » Cost-efficient → At which CO<sub>2</sub>-price?
  - Cost- efficient sequence of reduction measures?
- » Possible methodology:
  - » KO: Market with negative CO<sub>2</sub>-price → fuel consumption greater than demand,...
  - » Methodology based on invest.m → Principle:

## How to deal with no-regret measures? Possible methodology: Principle

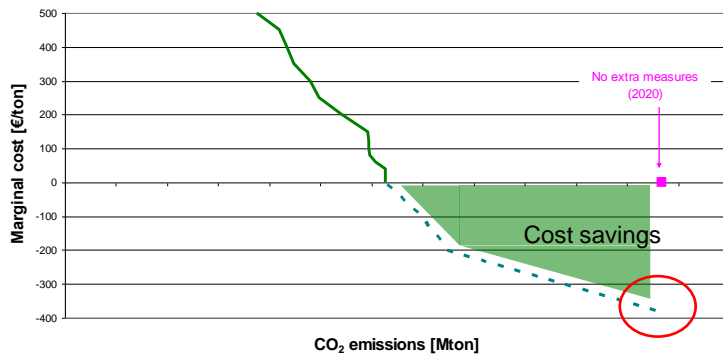
For each reduction measure: Estimation invest.m's for 2 CO<sub>2</sub>-taxes (No investments allowed)

⇒ Result: If invest.m = 0 → Marginal Costs MC for every reduction measure (no-regret: MC < 0)

⇒ Sequence is known ↔ if dwelling characteristics ~ characteristics in 2005

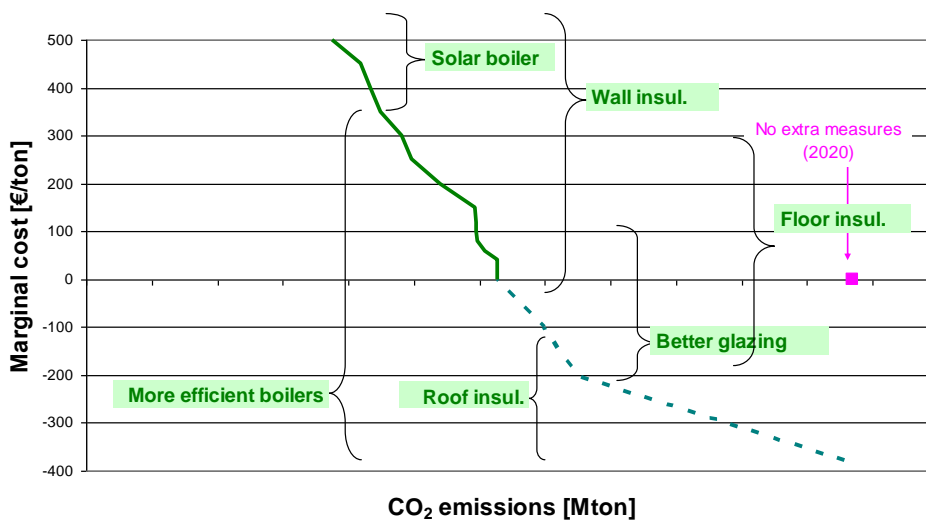


## How to deal with no-regret measures? Possible methodology: Principle



?The exact trajectory?

## Result: Marginal Abatement Cost Curve 2020 Cost-efficient reduction measures?



## Conclusion

- » Difficulties:
  - » Exact cost-efficient sequence of no-regret measures?
  - » Exact trajectory of MAC at negative CO<sub>2</sub>-prices?
  
- » Answers are important because no-regret measures play an important role in the residential sector!

Thank you!

