Introduction

- History
  - Dutch model
  - Studies on energy efficiency of technologies
  - Western European model

- Why remodelling
  - Over detailed
    - Fake accuracy
    - Unnecessary complex
  - Balance the model with respect to other sectors
Boundary conditions on redesign:

- Future question to be answered
- Keep model as simple as possible

Look for balanced description of the residential sector!

Current 18 energy demand categories

- Space heating
  - North (SFD, MFD)
  - Middle (SFD, MFD, NEW)
  - South (SFD, MFD)
- Water heating
  - North
  - Middle
  - South
- Food preparation
- Lighting
- Refrigeration
- Dish washing
- Clothes washing
- Clothes drying
- Other electric appliances Existing
- Other electric appliances New

SFD: single family dwelling, MFD: multi family dwelling, NEW: new dwellings
New energy demand categories (11)

- Space heating
  - Regions
  - Types of dwellings (new and existing)
- Water heating
  - Regions
  - Cooking (?)
- Aggregated electric demand

- Hence considerable reduction of categories

Current modelling technologies for space and water heating

**Space heating:**
- Demand technologies (T)
- 112 technologies
- Saving package (S) on technology modelled with saving as input (CSV).
  - Saving does not decrease the capacity of boilers

**Water heating:**
- 29 technologies
- No saving
Disadvantages:
• Too much detail, especially for the future. E.g. based on actual technologies.
• Saving packages on technologies
• No “combi” of combi boilers

Desired modelling:
• 1 technology for each energy carrier
• Saving packages model as black boxes and separate from technology
  – Long lifetime savings (insulation)
  – Short lifetime savings (coated windows / advanced technologies)
• Combi boilers
Problem

Relative dimensioning of capacity for space heating and water heating.

• Fixed output share [PJ/PJ]
  – throw away space heat
  – use other water heating technology

• Using LIMIT
  – Optimising water heating
  – …

Possible solutions

1. Old situation
   – no link space heating water heating
   – Extra technologies

2. Aggregate space and water heating
   – Different seasonal demand curves
   – Loose detailed distinction
   – Technological restrictions

3. ….?