Ventilative cooling in building regulations The Netherlands

Workshop 'Ventilative Cooling'

Brussels March 19 – 20, 2013

Bas Knoll

TNO innovation for life

Energy Performance Coefficient EPC = normative Energy Performance Indicator EP for year 2000

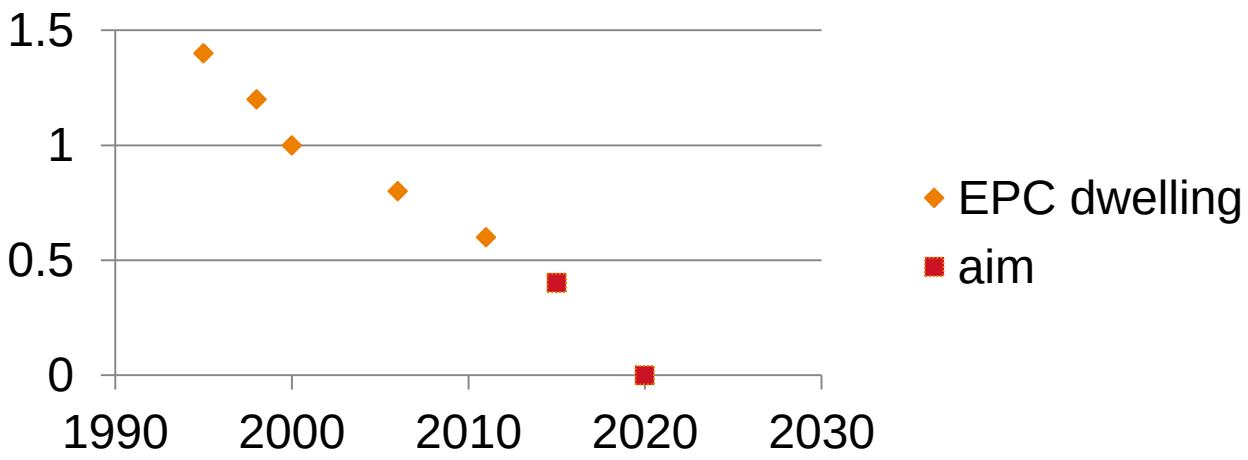
$$EPC = \frac{specific\ energy\ use}{acceptable\ energy\ use\ year\ 2000} \times present\ demand$$

Dutch Building Directive ‘Bouwbesluit’ 2012

Demands for the energy performance coefficient EPC of new buildings, e.g.:

- Dwellings 0.6
- Office buildings 1.1
- Schools 1.3

EPC to be calculated according to standard NEN 7120.



Specific energy use NEN 7120

- Balance of building heating and cooling demand:
  - Conduction losses through the building envelope
  - Ventilation losses → based on ventilation flow NEN 8088
  - Solar and internal heat gain
- Hot tap water usage
- Electrical power use, building and systems related

- Heating and cooling according to static calculation method
- Monthly averaged, corrected for dynamic effects at EPC=1
- Heating demand at 20°C inside, cooling demand at 24°C inside

- Excessive cooling demand is considered as penalty for EPC

Ventilation part – NEN 8088

Ventilation heating or cooling losses in NEN 7120 are based on an (energetic) equivalent air flow from NEN 8088:

- Total air flow × temperature correction factor

The total air flow is a sum of:

- System flow
- Infiltration flow
- Airing flow
- Additional flow through the building for combustion appliances

Temperature correction due to:

- Heat recovery
- Passive solar gain (conservatory, atrium) or active (solar collector to air)
- Ground source (preheating / precooling)

Airing / ventilative cooling in NEN 8088

Cooling demand accounts for:

- Basic airing (increased compared to heating season)
- Usage and/or control of system overcapacity
  - Natural supply systems
  - Variable (outside air) flow systems
  - Additional purge air system capacity (incl. temperature correction)
- Type and control of the heat recovery bypass
- Increased effect of night use (passive cooling)
- Presence of windows

Heat demand (effect in the heating season):

- Basic airing heat losses are taken into account