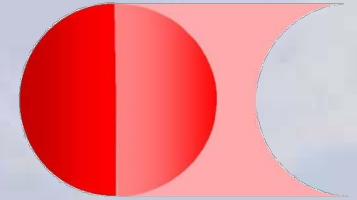


# Experience with application of principle of equivalence in NL

Tom J. Haartsen

CLIMATIC DESIGN CONSULT

# Research to application of principle of equivalence



Research executed in 2008 by

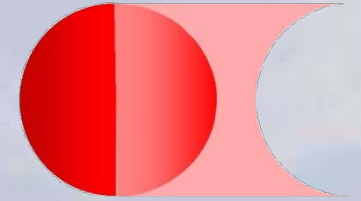
DGMR consulting engineers and  
Climatic Design Consult

commission: AgentschapNL (former SenterNovem)

random sample 15 municipalities

restricted to energy performance of new dwellings

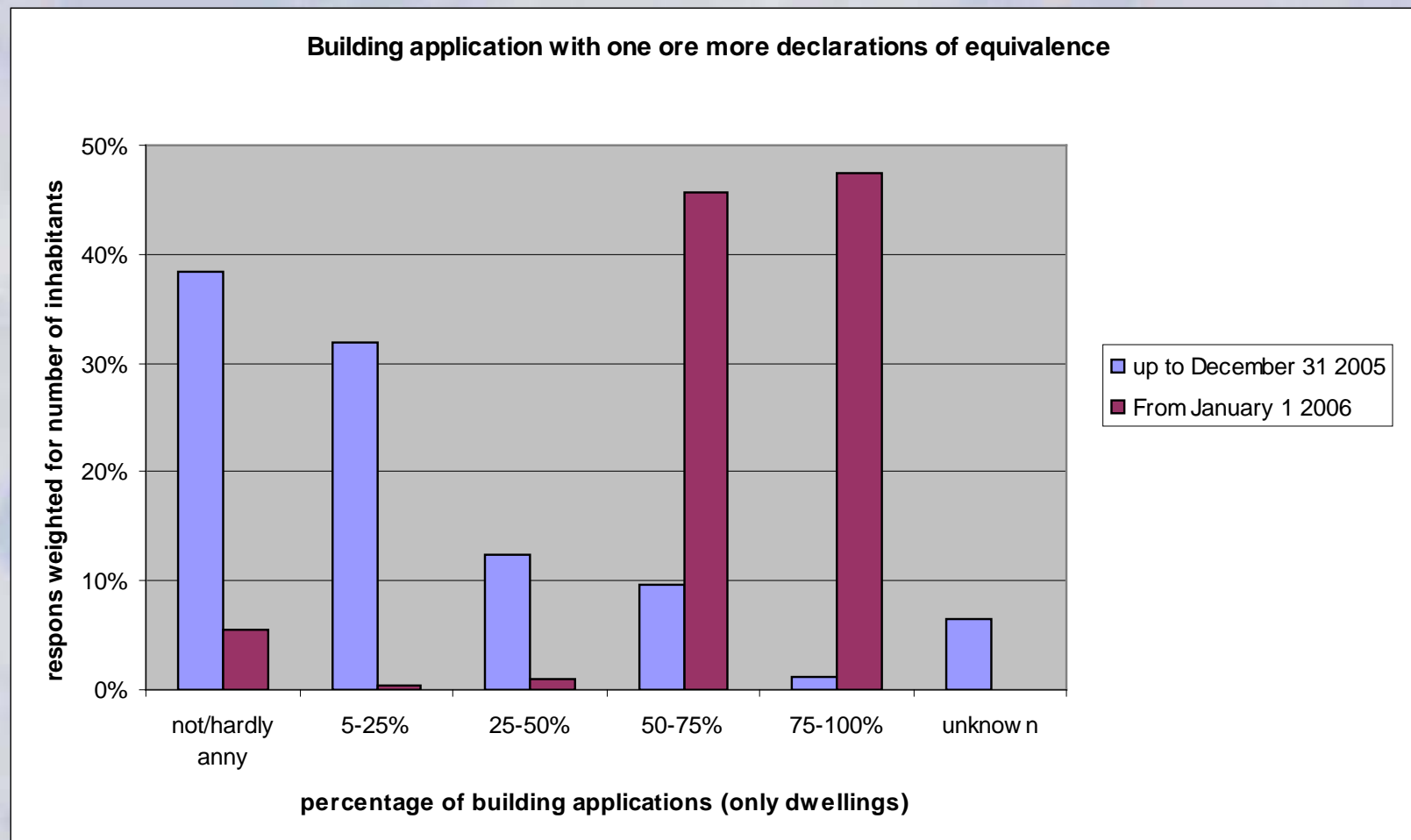
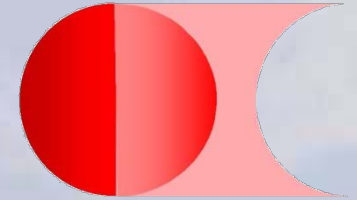
# Research to application of principle of equivalence



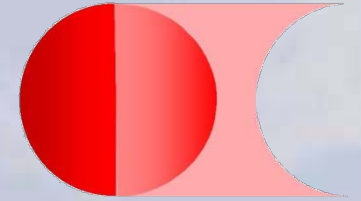
## Reasons for research

- sharp increase use of equivalence after tightening EP-requirement

# Number of applications with one or more declarations



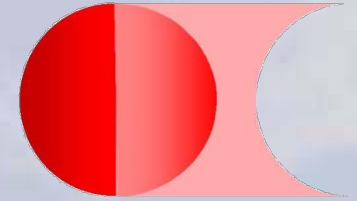
# Research to application of principle of equivalence



## Reasons for research

- sharp increase use of equivalence after tightening EP-requirement
- administrative costs (applicant)
- lacking capacity of verification (municipalities: manpower, knowledge)

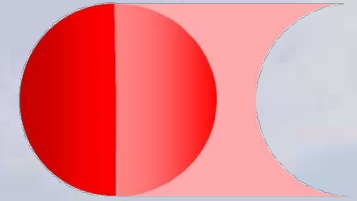
# Research to application of principle of equivalence



## Reasons for research

- sharp increase use of equivalence after tightening EP-requirement
- administrative costs (applicant)
- lacking capacity of verification (municipalities: manpower, knowledge)
- reduction of realized energy conservation in case of false claims (Every 0,01 improvement of the energy performance number in NL is said to result in a yearly extra turnover for the relevant product of € 12.000.000)

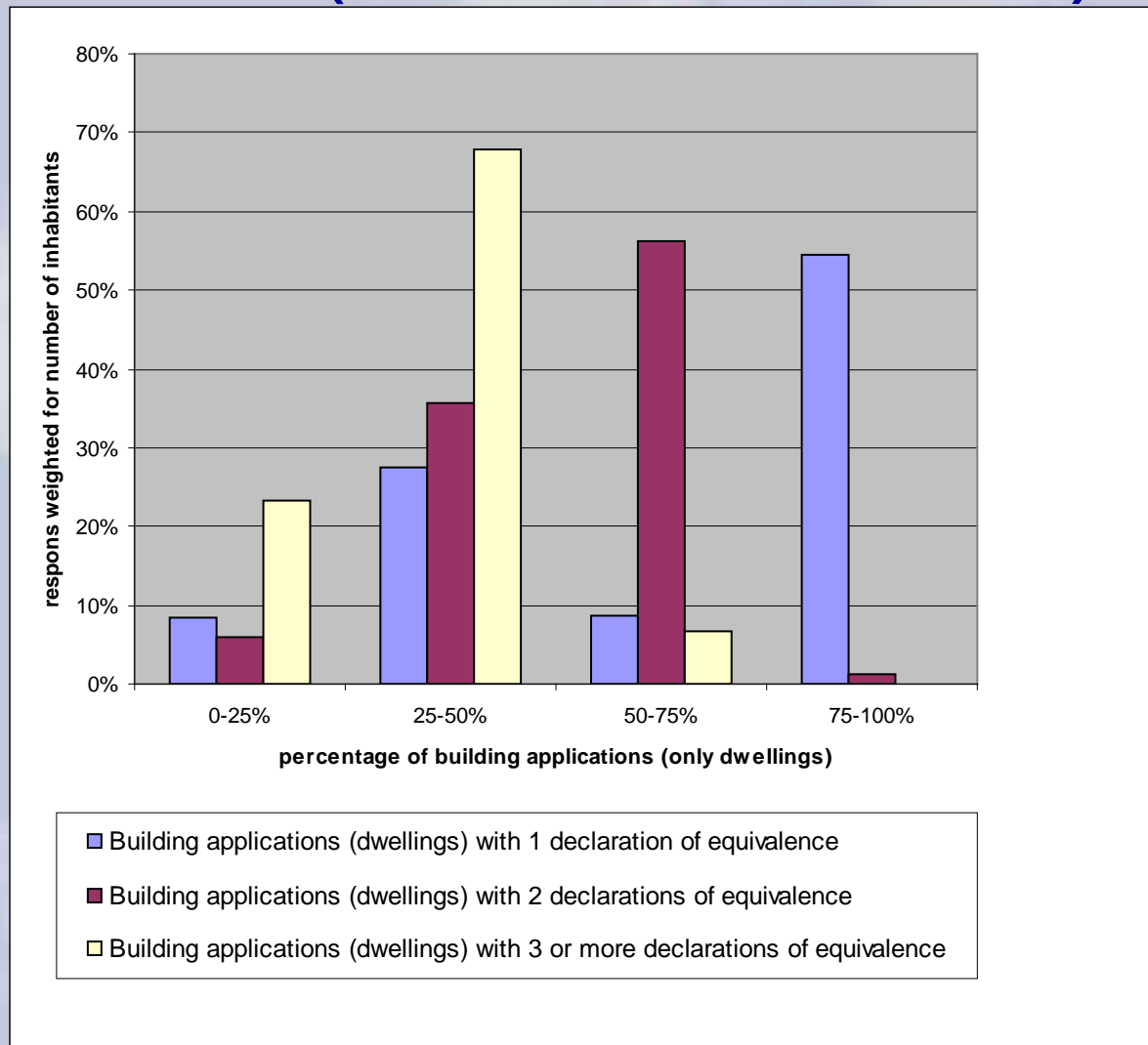
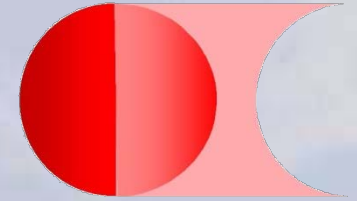
# Research to application of principle of equivalence



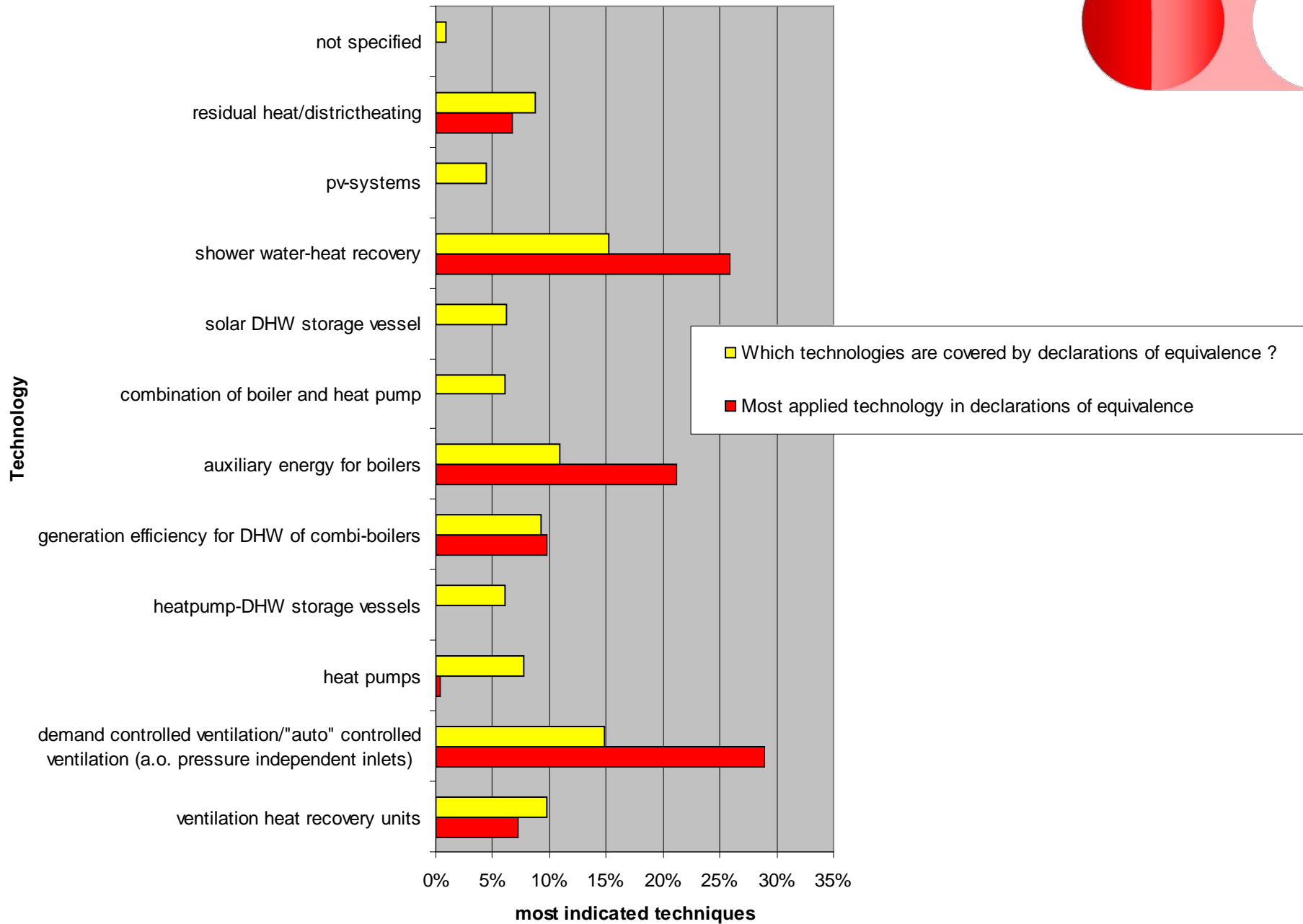
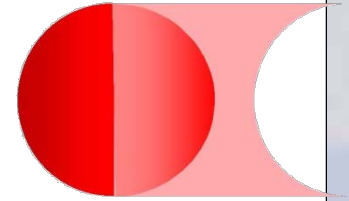
## Contents of research:

- inquiry to numbers of declarations of equivalence in building applications
- global judgement of validity of claimed energy reduction
- (process and quality) of assessment of declarations
- recommendations for better quality and assessment
- possibilities for reduction of number of equivalence declarations

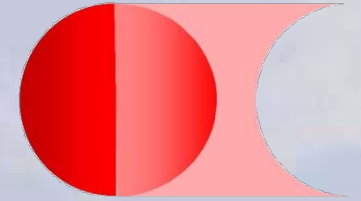
# Number of declarations per application (after 1-1-2006)



# Techniques in declarations of equivalence



# Research to application of principle of equivalence



- inquiry to numbers of declarations of equivalence in building applications
- **global judgement of validity of claimed energy reduction**
- (process and quality) of assessment of declarations
- recommendations for better quality and assessment
- possibilities for reduction of number of equivalence declarations

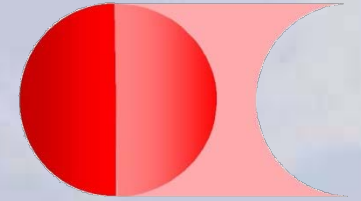
# declarations of equivalence:

## validity claimed energy reduction

### Findings:

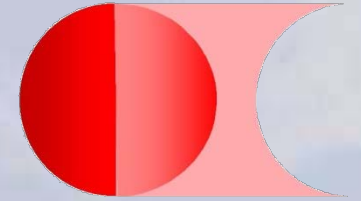
- due to legal implementation no uniform criteria for declarations of equivalence
- therefore different calculations and different starting / boundary conditions (e.g. assumed occupant behavior) without large scale demonstrated energy conservation
- up to now in general lacking probabilistic bases

# Research to application of principle of equivalence



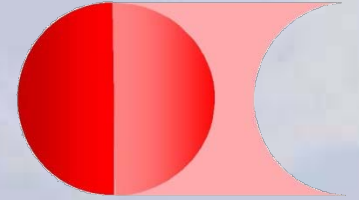
- inquiry to numbers of declarations of equivalence in building applications
- global judgement of validity of claimed energy reduction
- **(process and quality) of assessment of declarations**
- recommendations for better quality and assessment
- possibilities for reduction of number of equivalence declarations

# Control of equivalence declarations (dwellings)



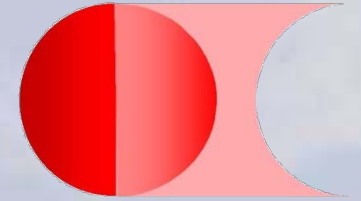
- 3 out of 15 municipalities even don't check the **presence** of declarations of equivalence (hence: nor the content)
- 5 more municipalities only occasionally check the **content** of the declarations
- only 1 municipality uses a protocol for judgement of declarations of equivalence

# Control of equivalence declarations (dwellings)



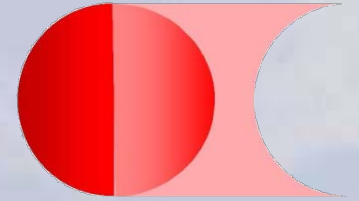
- content is not judged in a uniform way
- a former national board for uniform judgement was only consulted by a limited number of municipalities
- the way deviating values are used in recalculation of EP is only checked on a regular base by 6 municipalities
- municipalities express a large need for support !  
(a.o. expressed in increased number of specific questions about equivalence at two national helpdesks)

# Research to application of principle of equivalence



- inquiry to numbers of declarations of equivalence in building applications
- global judgement of validity of claimed energy reduction
- (process and quality) of assessment of declarations
- **recommendations for better quality and assessment**
- possibilities for reduction of number of equivalence declarations

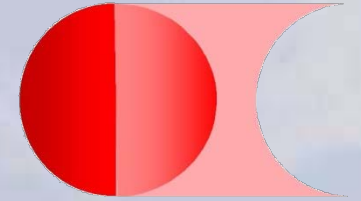
# Improve application of equivalence declarations



Recommendations for improved quality and control **through standardization:**

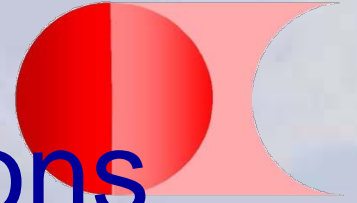
- clear description of background of energy performance standard, boundary conditions and fixed values to be taken in account
- description of probabilistic base: claimed energy reduction if occupant behavior or control is involved to be demonstrated in statistic significant samples

# Research to application of principle of equivalence



- inquiry to numbers of declarations of equivalence in building applications
- global judgement of validity of claimed energy reduction
- (process and quality) of assessment of declarations
- recommendations for better quality and assessment
- **possibilities for reduction of number of equivalence declarations**

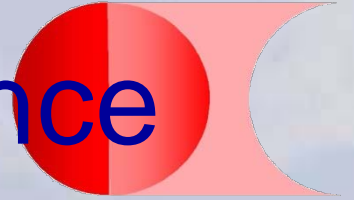
# Restrict number of declarations



Recommendations to restrict equivalence declarations:

- Rapid implementation of frequently used techniques in energy performance standard and software
- fixed values should be representative
- default values should be slightly conservative
- robust rounding rules

# Recommendations equivalence in energy performance



Equivalence declarations can have high commercial potential. Therefore:

- 1 Restrict equivalence declarations to
  - a) scarcely applied techniques or
  - b) really innovative techniques with:
    - limited time span of validity until/or
    - clearly proven energy conservation
- 2 Organise national uniform expert judgement