



Vlaanderen  
is materiaalbewust

# Benchmarking van de milieu-impact van bouwwerken

## Stavaza en toekomstplannen

Evi Rossi 1 februari 2024

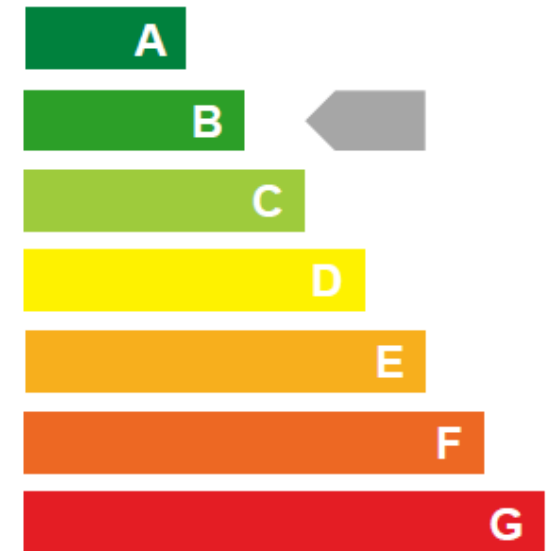
SAMEN MAKEN WE  
MORGEN MOOIER

**OVAM**



# Waarom benchmarken?

- **Waarom?** Milieu-impact in TOTEM is abstract, een streefdoel is duidelijker
- **Doel:** milieu-impact (incl. CO<sub>2</sub>) van (ver)bouwen verminderen
- **Hoe?** Door te kiezen voor materialen met lagere milieu-impact
- **Optimaliseer je materiaalkeuze** → materiaalbewust én energiezuinig (ver)bouwen → idealiter: zoek optimum van directe én indirecte emissies
- **Toekomst:** M-peil? ME-peil?



# M-peil - (onderzoeks)vragen

- 1. Per bouwwerk: wat zijn mogelijke **streef- en limietwaarden** van milieu-impact? Residentieel, daarna niet-residentieel.

*Onderzoek VITO en KULeuven*

- 2. Vlaams totaal: Hoe sterk **daalt de CO<sub>2</sub>-impact** tgv invoeren M-peil?

*Onderzoek Steunpunt Circulaire Economie (CE Center)*

# Benchmark methode

Flemish Climate Strategy 2050: limit of 2.3 MtCO<sub>2</sub>eq/year for the building sector by 2050  
=reduction of 81% compared to 2017, improved building energy performance + reduced material (i.e. embodied) impact

## Benchmark method



### Top-down approach

benchmarks derived from environmental goals and/or policy targets (e.g. Paris Agreement)



Target ▶



### Bottom-up approach

benchmarks derived from statistical analysis of reference buildings

EPB cases (VEKA)



Best-practice ▶

Reference ▶

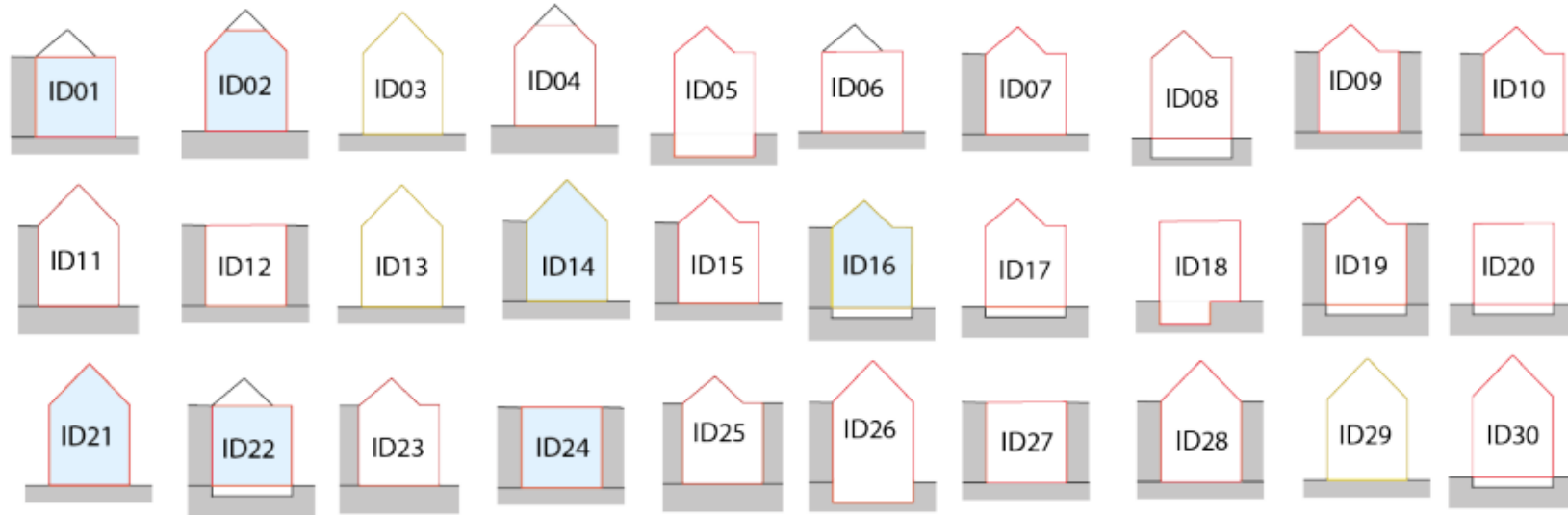
Limit ▶



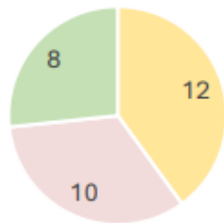
# Wat zijn de streef- en limietwaarden van de milieu-impact? (Benchmarking)

- Bepalingswijze:
  - “Bibliotheek” opbouwen: representatieve bouwwerken selecteren en modelleren
  - Elementen + varianten materialiseren
  - Milieu-impact berekenen per element/per bouwwerk
  - Grenzen “kiezen” – categorieën definiëren

# “Bibliotheek” – eengezinswoningen en appartementen

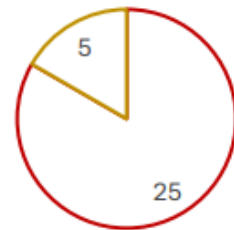


Dwelling type



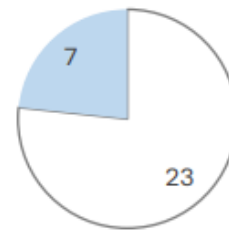
- Detached
- Semi-detached
- Terraced

Construction type



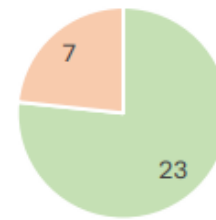
- Solid
- Timber

Energy performance



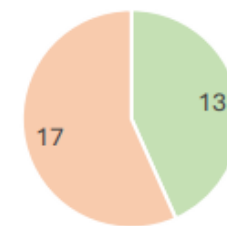
- EPB2015
- nZEB

Heating & DHW



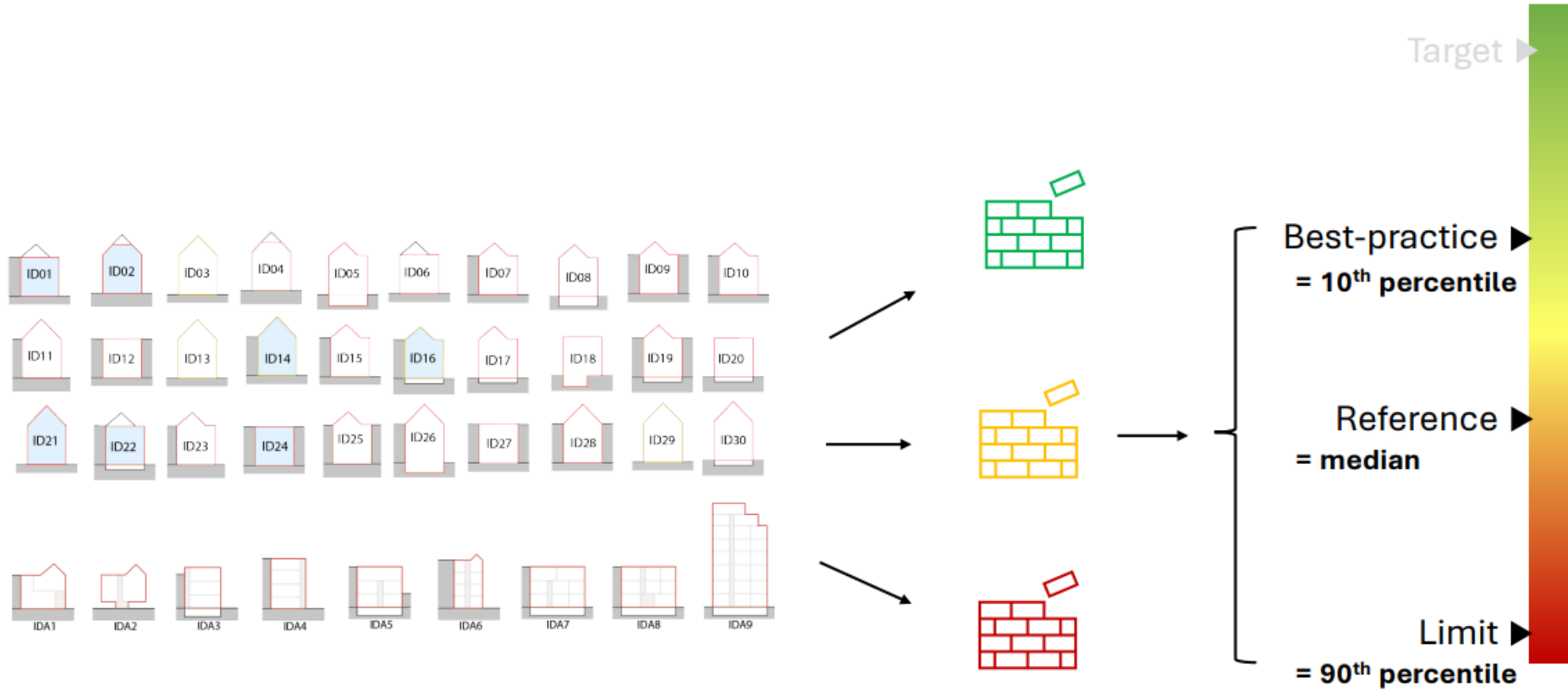
- Condensing gas boiler
- Heat pump

Ventilation system



- System C
- System D

# Varianten per element



# Varianten per element

## Fixed and variable parameters

### GEOMETRY

Building type (e.g. detached)

Construction type (e.g. solid)

Presence of XX m<sup>2</sup> of basement, attic...

⇒ Note: the EPB cases do not include a cross laminated timber construction type

### MATERIALISATION

Construction (e.g. fired clay, sand-lime)

Insulation (e.g. PUR, XPS board)

Finishing (exterior and interior)

Window frame (e.g. wood, PVC)

Etc.

### ENERGY

Insulation level (EPB / passive)

Heating and DHW system

Ventilation system (C / D)

Solar energy system (PV / boiler)

Heat emission system (radiator / surface heating)

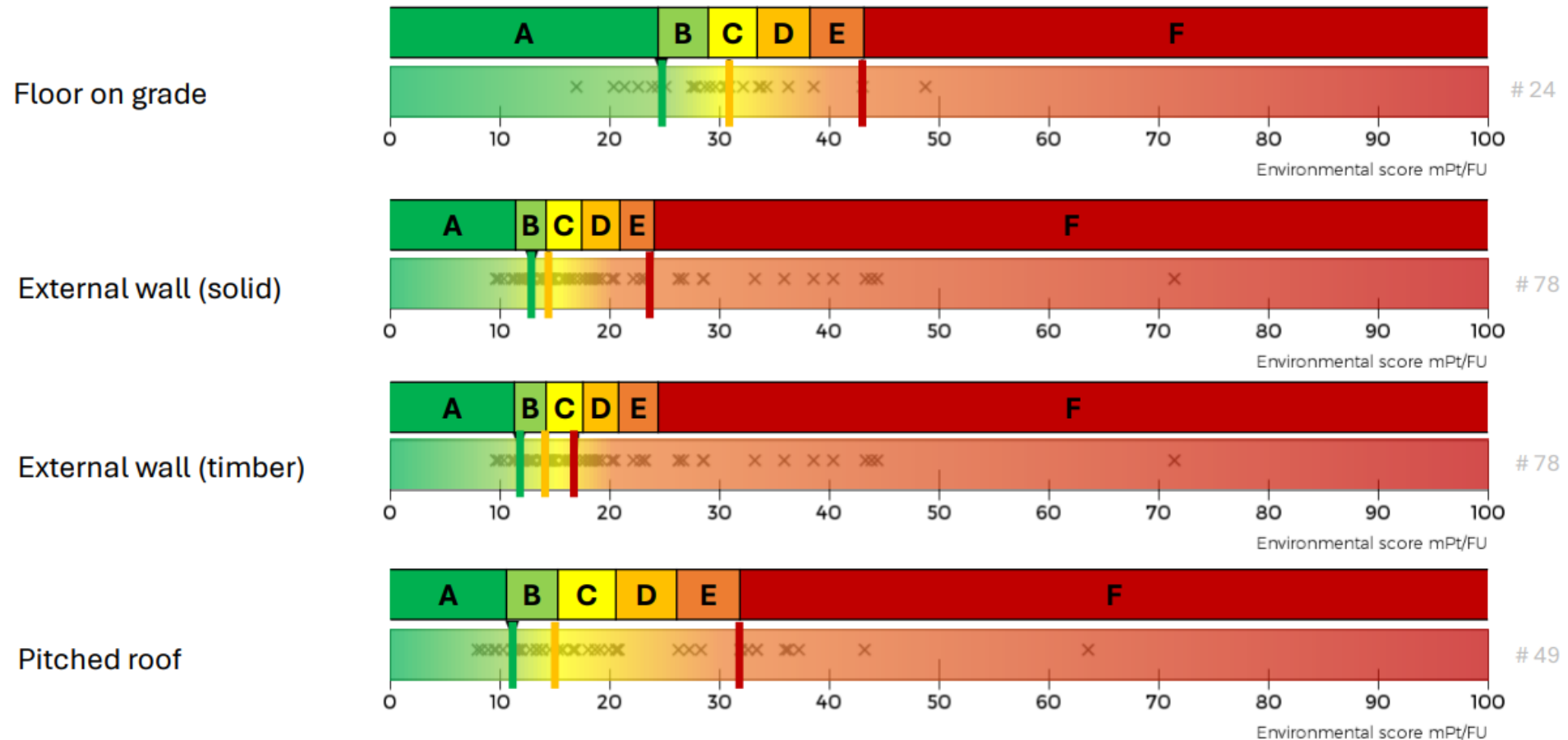
Fixed

Variable

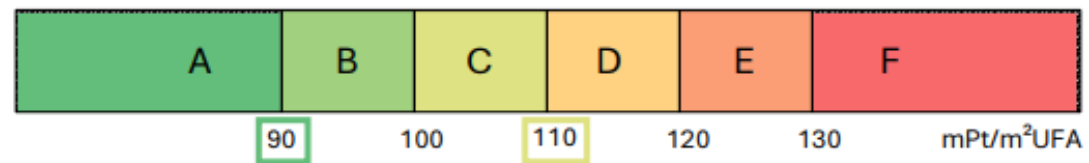
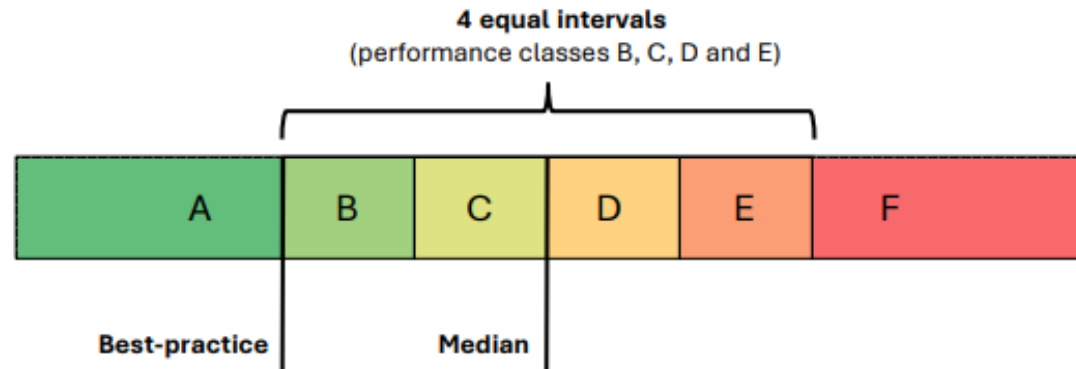


# Varianten per element

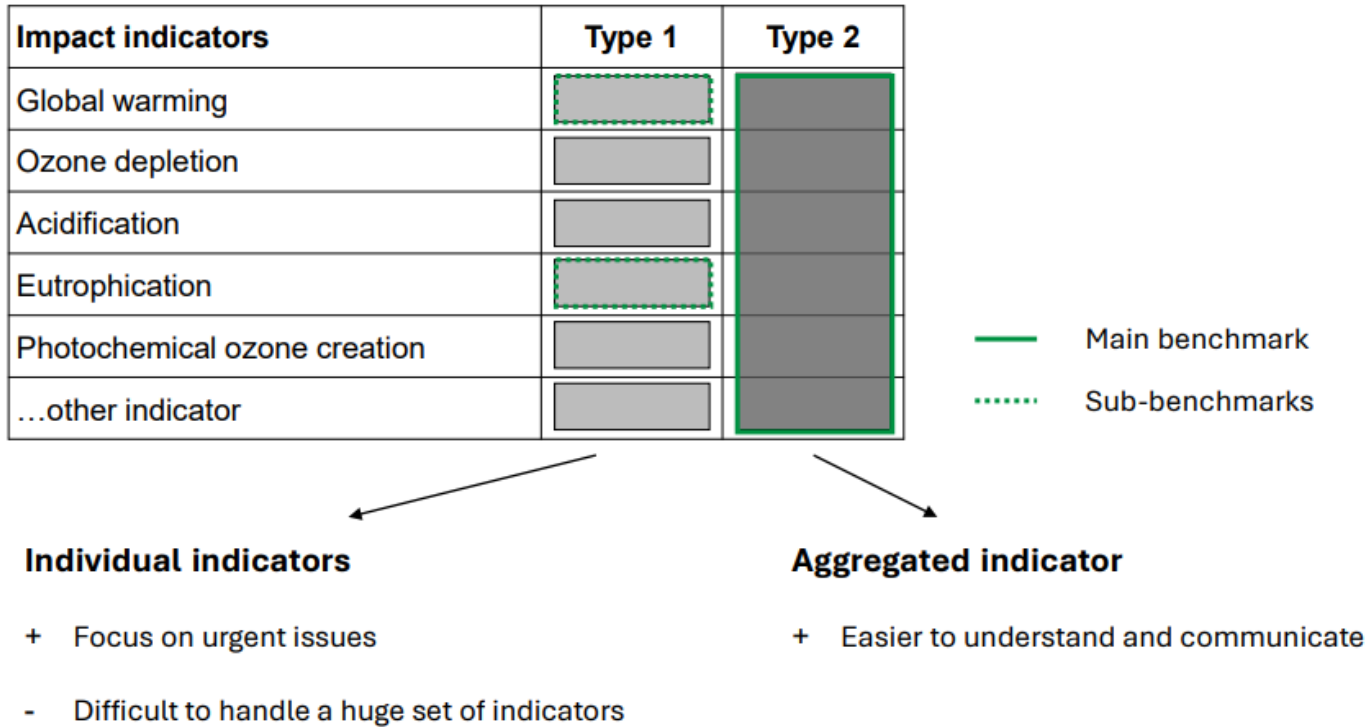
## Benchmarking at building element level



# Benchmarkschaal



# Benchmarkschaal – hoofd – versus subbenchmarks



# Benchmarkschaal in TOTEM

**totem**  
CREATE | EVALUATE | INNOVATE

Projects Library

Welcome Damien Trigaux

Results Compare Add Open From library To library Import Export Duplicate Delete

Buildings

Search for text or use <4, >6, =3 ... for numeric searches

Sort by: A-Z 8 buildings found

Residential - Apartment	Residential - Detached	Residential - Semi-detached	Residential - Semi-detached	Residential - Semi-detached	Residential - Semi-detached	Residential - Semi-detached	Residential - Terraced
MFH_Apartment_Solid_PE41_LIB_New 1042 m <sup>2</sup> 2761.3 m <sup>3</sup> 77.92 mPt/m <sup>2</sup>	SFH_Detached_Solid_PE67_LIB_New 123 m <sup>2</sup> 382 m <sup>3</sup> 110.29 mPt/m <sup>2</sup>	SFH_Semi-detached_Solid_PE34_LIB_New 144 m <sup>2</sup> 525 m <sup>3</sup> 81.68 mPt/m <sup>2</sup>	SFH_Semi-detached_Solid_PE37_LIB_New 144 m <sup>2</sup> 525 m <sup>3</sup> 86.76 mPt/m <sup>2</sup>	SFH_Semi-detached_Solid_PE60_LIB_New 144 m <sup>2</sup> 525 m <sup>3</sup> 95.77 mPt/m <sup>2</sup>	SFH_Semi-detached_Solid_PE63_LIB_New 144 m <sup>2</sup> 525 m <sup>3</sup> 120.22 mPt/m <sup>2</sup>	SFH_Semi-detached_Timber_PE60_LIB_New 144 m <sup>2</sup> 525 m <sup>3</sup> 81.84 mPt/m <sup>2</sup>	SFH_Terraced_Solid_PE33_LIB_New 200 m <sup>2</sup> 549 m <sup>3</sup> 73.57 mPt/m <sup>2</sup>

**Building details** Results

Detailed results

**Environmental performance**

96

Climate change

1367

**Impact per element category**

Disclaimer:

- In the current version, the different environmental impact categories are normalised and weighted to one single score (see detailed results for more details).
- The current version of TOTEM considers recycled content of raw materials; in contrast, net benefits and impacts of future reuse, energy recovery, and recycling potential beyond the current building life cycle are not yet included, but these will be considered in a next version of TOTEM. Reuse of components or building elements can lead to a significant environmental impact reduction in the longer term.
- In order to make proper comparisons between different building solutions, it is important to compare solutions with similar technical performances as regards U-value, acoustic performances, fire resistance, et cetera.
- Some element categories such as stairs, foundations, balconies and electrical services are not yet included in TOTEM and will be added in future versions. The environmental impact of the building is therefore currently underestimated.

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# Naar een regelgeving?

## ▶ Naar een regelgeving ?

- Sinds 2018 in Nederland
- Sinds 2022 in Frankrijk
- Vanaf 2023 in Denemarken
- ...

## ▶ Herziening EPBD

- Beoordeling koolstofemissies over **hele levenscyclus**
  - Vanaf 2028: alle nieuwe gebouwen > 1000m<sup>2</sup>
  - Vanaf 2030: alle nieuwe gebouwen
- Vanaf 2030: grenswaarden ~ M-peil

## ▶ Regeerakkoord – een stapje verder?

- Totale impact ipv koolstofemissies?
- Alle vergunningsplichtige renovaties ipv renovaties met A+ label?



# Vragen? Feedback?

# Bedankt!

1 februari 2024

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