Experiences from decided climate regulation from the authority’s

Nordic Climate Forum for Construction

Experiences from Denmark

Niels Bruus Varming

Danish Authority of Social Services and Housing

Viden til gavn

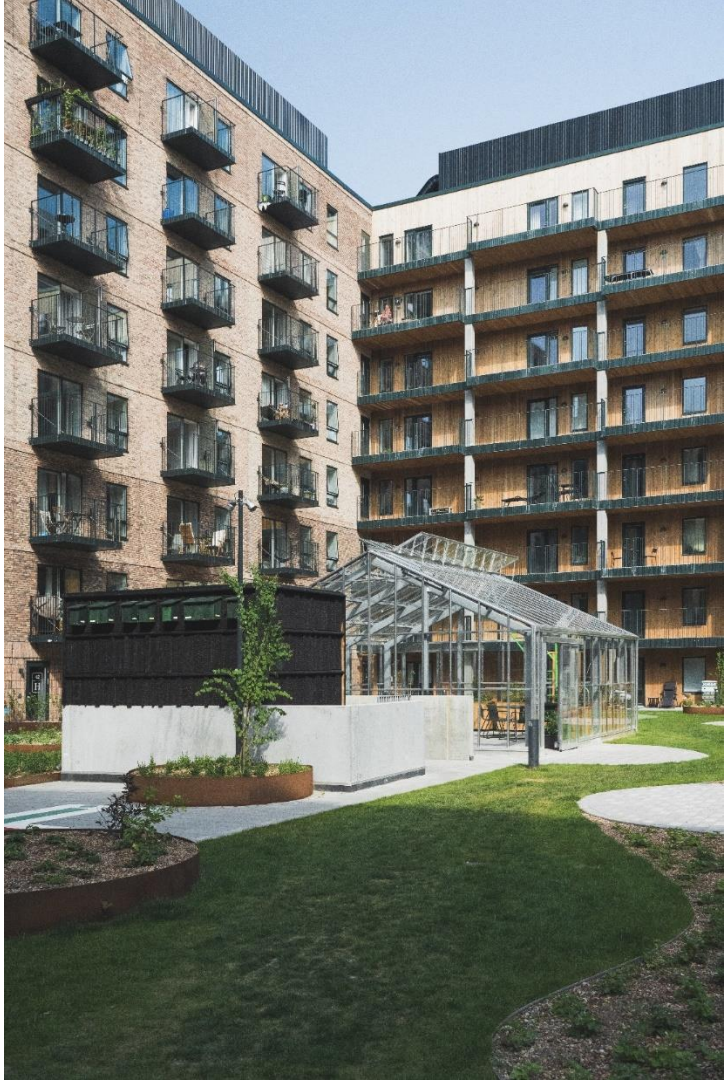
Main points from the agreement

The intension is to speed up the green transition in construction with the following additional measures to limit construction's climate impacts and resource consumption:

- Tightening the CO_2e limit value for the climate impact of buildings *(by more than stated in the previous agreement).*
- Differentiate the limit value on the basis of building types.
- Expanding the scope of new construction covered by the CO_2e limit value
- Exempt special socially critical buildings and unheated buildings under 50 m^2 from the CO_2e limit value
- Including emissions from the construction process and at a CO_2e limit value.
- Fundamental revision of the building regulations in order to meet the clash between requirements for safety and health and the new CO_2e requirements and to be able to implement reliefs for building owners
- Adjusting the energy requirements for conversion of existing buildings to avoid demolitions

The CO_2e-limit value is tightened

- Average limit value at 7,1 kg CO_2e/m^2/year.
- Approx. 85 pct. of the new construction included in the agreement needs to perform better compared to 2021 – the previous agreement was 33 pct.
- The limit value will be differentiated
- The voluntary CO_2e-class (lavemissionsklassen) is adjusted so it aligns with the gradual tightening of the limit values.



More new construction covered by LCA-requirement

The scope is expanded from 57 pct. to 68 pct. of the new construction by:

- Including holiday homes
- Including unheated building over 50 m^2.
  e.g. parking garages and storage buildings.
- Including extensions to apartment buildings, office buildings, institutions and other construction (limit value as building type)
- For single-family houses, terraced houses, tiny houses and holiday homes, however, only extensions over 250 m^2 are included in the limit value

New exemptions from the limit value (must document climate impact):

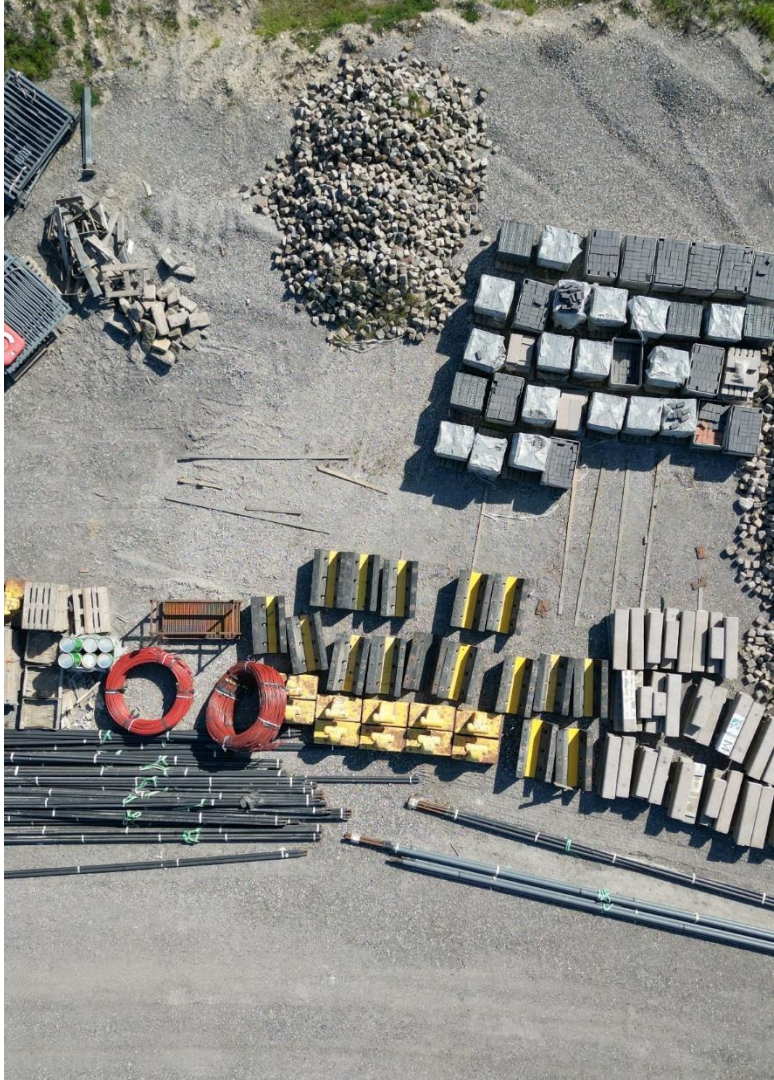
- Special critical buildings such as water works, prisons, the Armed Forces' operational buildings and hospitals.

Continuation of exemptions from limit value and documentation:

- Unheated buildings under 50 m^2 and agricultural buildings

Including the construction process in the limit value

- A requirement expansion with the climate impacts from the construction process (module A4 and A5)
- The limit value for the construction process is set corresponding to a level, so approx. half of all construction sites must perform better compared to 2021.
- An independent limit value for the construction process corresponding to 1.5 kg CO_2e/m^2/year.
- Other measures: In mid-2026, a study of the possibility of including outdoor areas on the building site will be submitted to the political parties behind the agreement



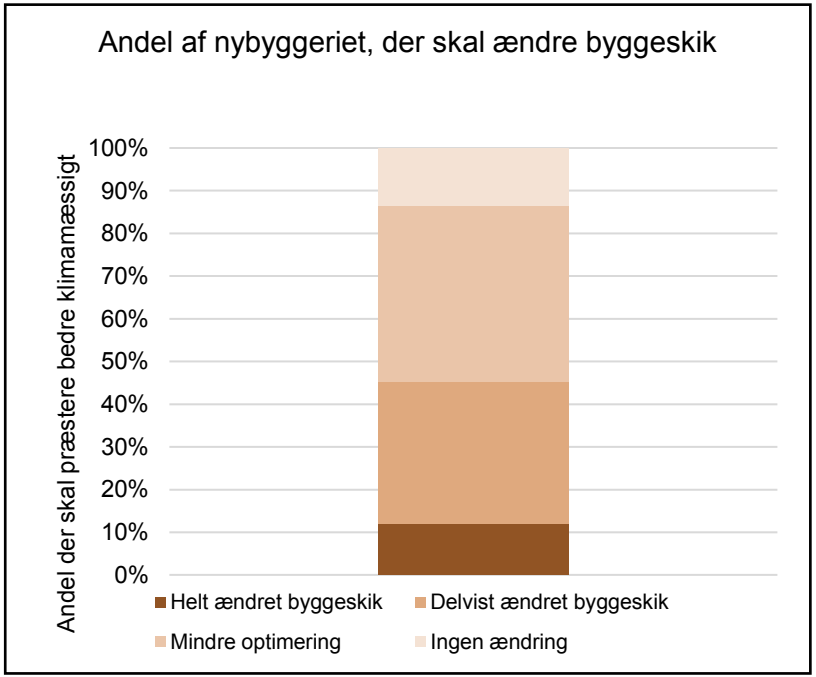
Kg CO_2e/m^2/year	2025	2027	2029
Limit value General Buildings	**7.1**	**6.4**	**5.8**
Holiday homes under 150 m²	4.0	3.6	3.2
Single-family houses, row houses, tiny houses, and holiday homes at least 150 m²*	6.7	6.0	5.4
Apartment buildings	7.5	6.8	6.1
Office buildings	7.5	6.8	6.1
Institutions (e.g., schools)	8.0	7.2	6.4
Other new constructions	8.0	7.2	6.4
Independent limit value for the construction process	1.5	1.3	1.1
Total limit including construction process	**8.6**	**7.7**	**6.9**

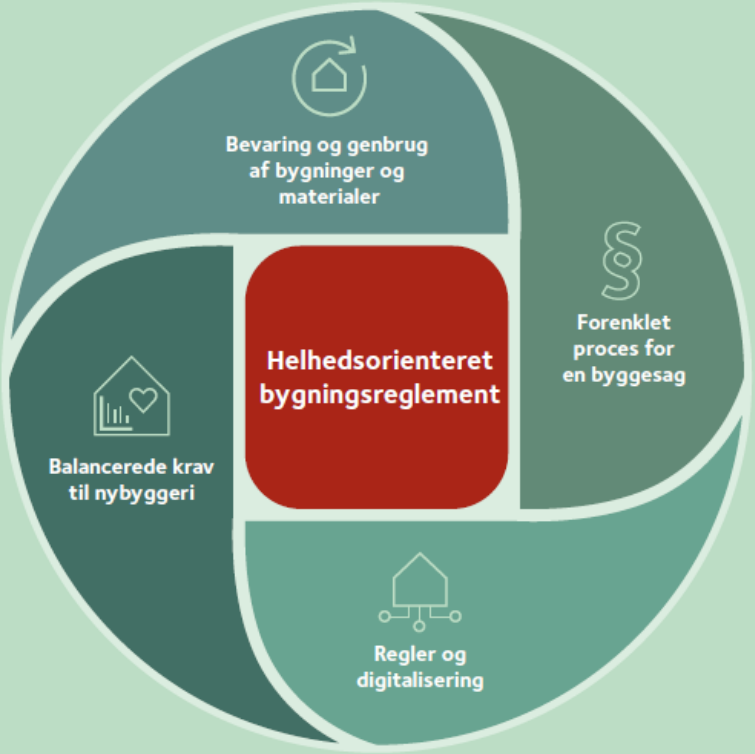
**The 150 m2 limit only accounts for holiday homes*

https://www.sm.dk/nyheder/nyhedsarkiv/2024/maj/ny-aftale-stiller-ambitioese-klimakrav-til-nyt-byggeri

Changes in the way of building

- There will probably be changes in the construction practices
- Our way of categorize
  - *Under the limit value without changes*
  - *Small optimizations – a reduction of 0 to 2 kg CO_2e/m^2/year.*
  - *Partly changed practices – a reduction of 2-4 kg CO_2e/m^2/year.*
  - *Totally changed practices – a reduction of more than 4 kg CO_2e/m^2/year.*





Four themes for basic revision of the Building Regulation

1: Technical requirements for new construction's safety, health, energy consumption and climate impact must be balanced and adapted so that the requirements go hand in hand and support new building practices.

2: Technical requirements for renovation and changing the use of a building must be adapted and simplified so that the existing building stock can be used better.

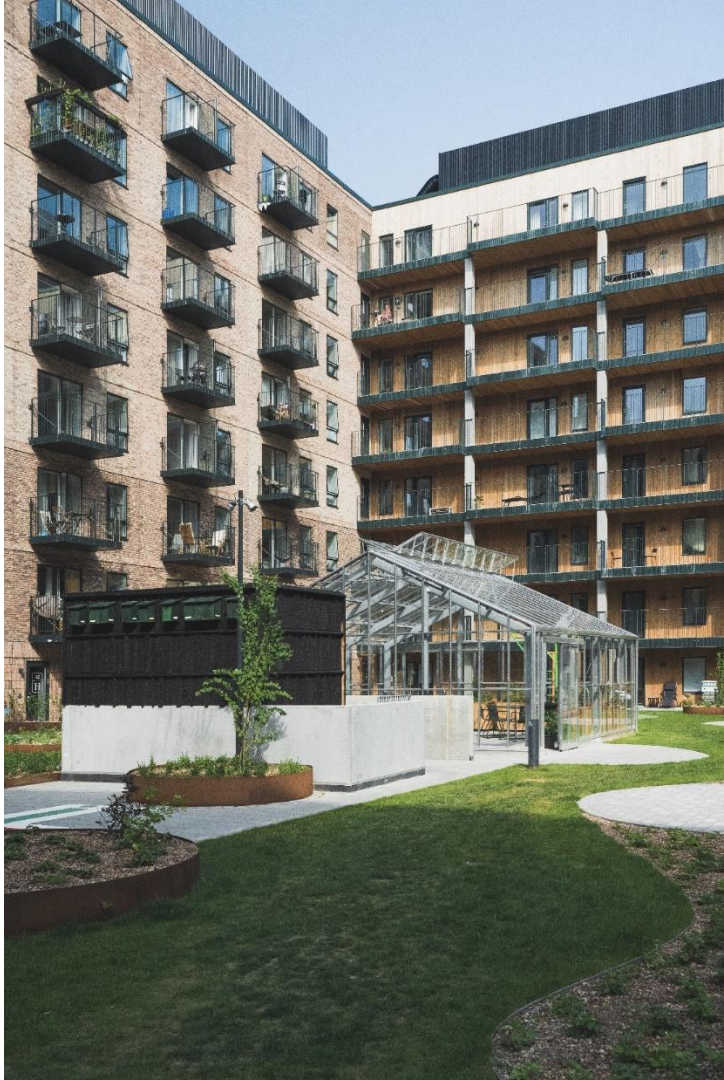
3: Requirements for municipal construction case processing and the certification schemes must be coordinated so that the overall process for approving a construction case is simplified with an eye to the construction processes.

4: The building regulations must increasingly support the industry and municipalities' use of digital processes and tools.

The full strategy: Helhedsorienteret bygningsreglement | Social- og Boligstyrelsen (sbst.dk)

Lesson from Denmark

- The standard is very good – but not written to be national requirements
- Need for many clarifications
  - *Which stages and modules to include?*
  - *Simplification to certain modules*
  - *How to address floor area?*
  - *Introduction of a generic database for construction materials*
  - *Building model*
  - *Life time of products and constructions*
  - *How to address the changing energy system*



Setting of limit values

- How to set limit values
  - *Data for setting limit values – representativity and data collection*
  - *CO2e/m2/year*
  - *Differentiation between building types*
  - *Mixed use buildings*
  - *How to adress special buildings with demand for certain CO2e-emitting solutions to fulfill their purpose*

Danish Authority of
Social Services and Housing

Questions?

Viden til gavn

Experiences from decided and coming climate regulation in Norway

Ingunn Marton

11. September 2024

Todays regulation in Norway
Greenhouse gas emissions calculation for buildings (TEK17 § 17-1)

Greenhouse gas calculation for apartment and commercial buildings must be compiled based on the method in NS 3720:2018 *Method for greenhouse gas calculations for buildings*.
The greenhouse gas calculation must as a minimum include modules A1-A4, B2 and B4 for building elements stated in the building parts table. In addition, the waste from the construction site must be included in the greenhouse gas

Module	Building Life Cycle Information
A1-A3	Product Stage
A4	Transport to site
B2	Maintenance
B4	Replacement

Building part	Building element
215 216	Pile foundation Direct foundation
22	Load-bearing systems
23	External walls
24	Internal walls
25	Slabs
26	Roof

Climate partnership

Byggenæringens klimafotavtrykk –
Report: Knowledge base for the construction industry was launched in June.

The partners are now discussing the content in the partnership

- The Government by KDD - Ministry of Local Government and Regional Development
- NHO - the Federation of Norwegian Construction Industries
- Fellesforbundet – The United Federation of Trade Unions

Når besluttes egentlig utslippene - og når kommer de?

1
PLAN OG REGULERING
- Regulering av områder til beyggelse og formål

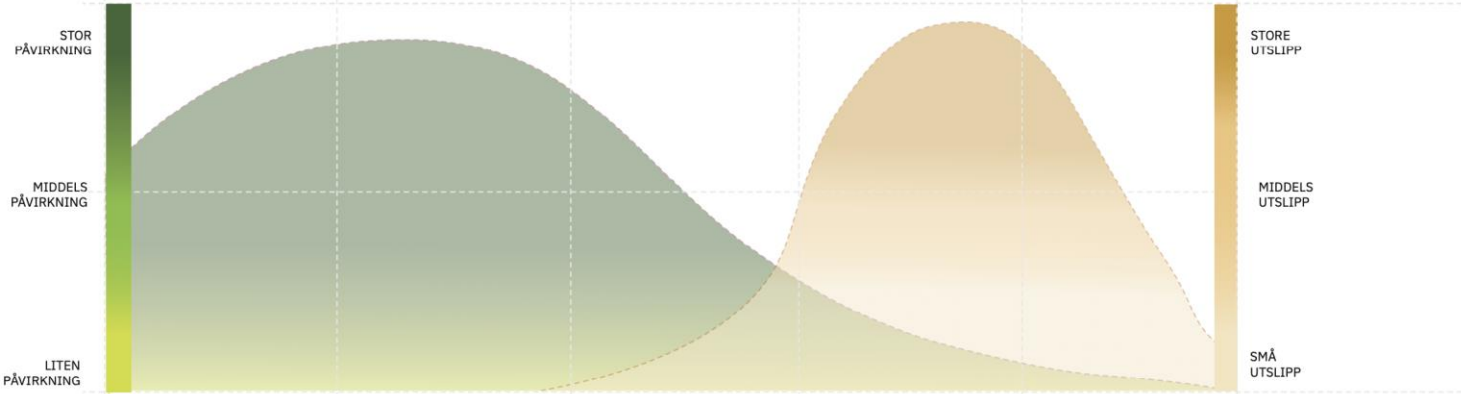
2
BEHOVSAVKLARING OG KONSEPTUTVIKLING
- Valg av tomt
- Planforslag
- Bygningsutforming
- Konsept for energi, bæresystem og byggeplass
- Gjennomføringsmodell
- Kontraktstrategi

3
KONSEPTBEARBEIDING OG PROSJEKTERING
- Bygningsutforming
- Dimensjonering
- Valg av bæresystem, energisystem o.l.
- Valg av byggetekniske løsninger

4
AKTIVITETER PÅ BYGGEPLASS:
- Grunnarbeid og massetforflytning
- Innkjøp av materialer og varer
- Byggeplasslogistikk
- Montering og bygging

5
FORVALTNING, DRIFT OG VEDLIKEHOLD:
- Drift av bygning og energisystem
- Reparasjon og mindre vedlikeholdsarbeider
- Leietakertilpasning

6
OMBRUK, RIVING OG RENOVERING
- Aktiviteter her starter prosessen på nytt fra behovsavklaring



PROSJEKTDELTAKERE:
- **Kommunen**
- (Innbyggere)
- (Næringsliv)

UTSLIPP SOM KAN PÅVIRKES:
- Arealbruk
- (Aktiviteter på byggeplass – håndtering av masser)

PROSJEKTDELTAKERE:
- **Utbygger**
- Arkitekt
- Rådgiver
- (Fremtidig eier)
- (Andre aktører)

UTSLIPP SOM KAN PÅVIRKES:
- Byggematerialer og -varer
- Arealbruk
- (Aktiviteter på byggeplass)
- (Energibruk i drift)

PROSJEKTDELTAKERE:
- **Arkitekt**
- **Rådgiver**
- Utbygger
- Leverandørindustri
- (Fremtidig eier)

UTSLIPP SOM KAN PÅVIRKES:
- Byggematerialer og -varer
- Energibruk i drift
- (Aktiviteter på byggeplass – logistikk og transport)

PROSJEKTDELTAKERE:
- **Entreprenør**
- Leverandørindustri
- Arkitekt
- Rådgiver
- (Utbygger)

UTSLIPP SOM KAN PÅVIRKES:
- Arealbruk
- Byggematerialer og -varer
- Aktiviteter på byggeplass – inkludert håndtering av masser

PROSJEKTDELTAKERE:
- **Eier**
- Driftsselskap
- (Leietaker)

UTSLIPP SOM KAN PÅVIRKES:
- Energibruk i drift
- Byggematerialer og -varer

PROSJEKTDELTAKERE:
- **Eier**

UTSLIPP SOM KAN PÅVIRKES:
- Energibruk i drift
- Byggematerialer og -varer – utskiftning og leietakertilpasning

Utarbeidet av mind/shift

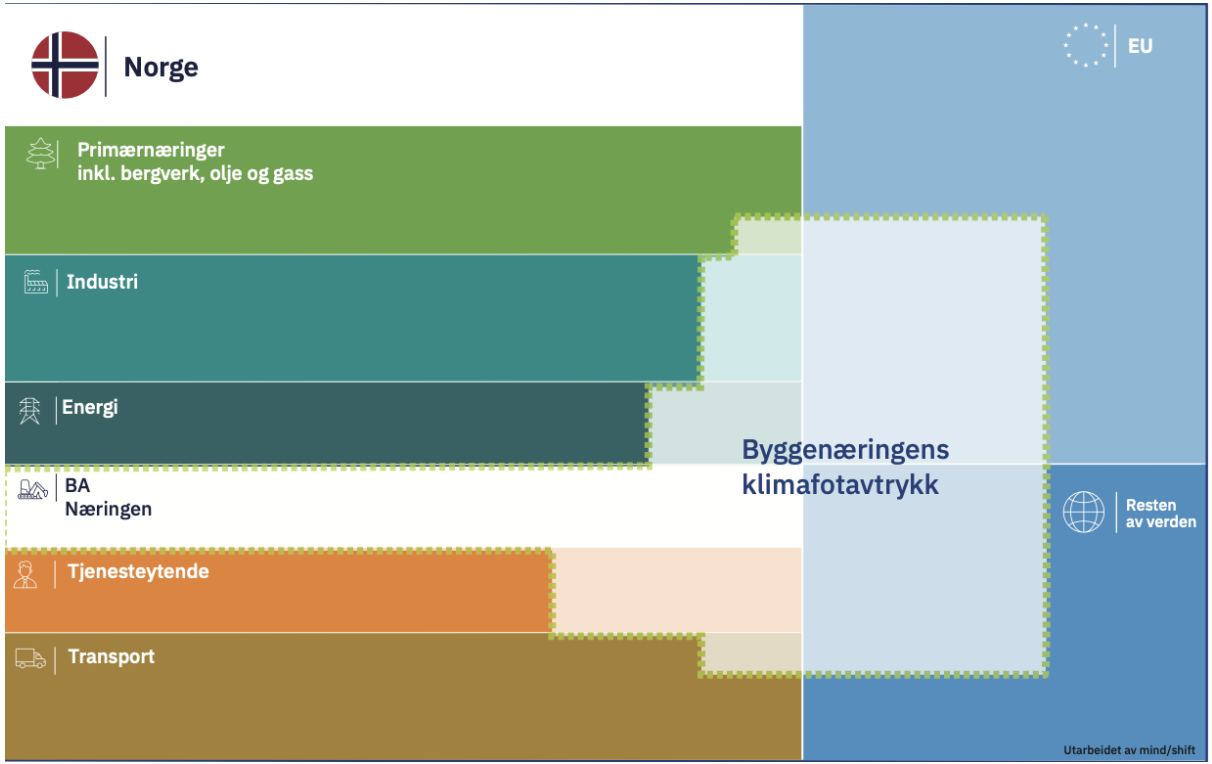
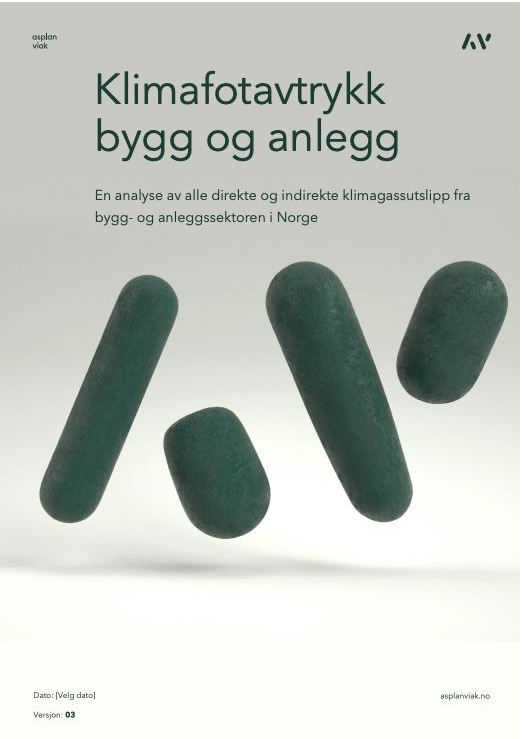


Illustration of the total climate fooprint for the building industry – directly and indirectly.

Approximate 50 % of the climate footprint is imported

Total climate footprint for buildings and constructions in Norway 2020



Report

- Building materials
- Import of buildling materials
- Other import
- Primary sector
- Services
- Transport
- Direct emissions from construction sites
- Direct energy use
- Indirect energy use

Possible climate requirements in the regulations (TEK17)

- Investigating how to set climate requirements, but first need to establish:
  - The Zero Alternative (Nullalternativet)
  - Validation of LCA tools (green house gases)
  - Guidance/supplement to NS 3720:2018 Method for greenhouse gas calculations for buildings
- Challenges:
  - Calculation methodology
  - Access to EPDs
  - What to include
    - Building elements
    - Modules
  - Energy Performance of Building Directive – the guidance

The Zero Alternative (Nullalternativet)

- Consequence analysis of the zero alternative and its affects on greenhouse gas emissions in the construction sector.
- The zero alternative - no changing in todays building regulations (TEK17).
- Evaluate how other regulations, measures and actions will influence the climate footprint of buildings.
- Final report end of September

Validation of LCA tools

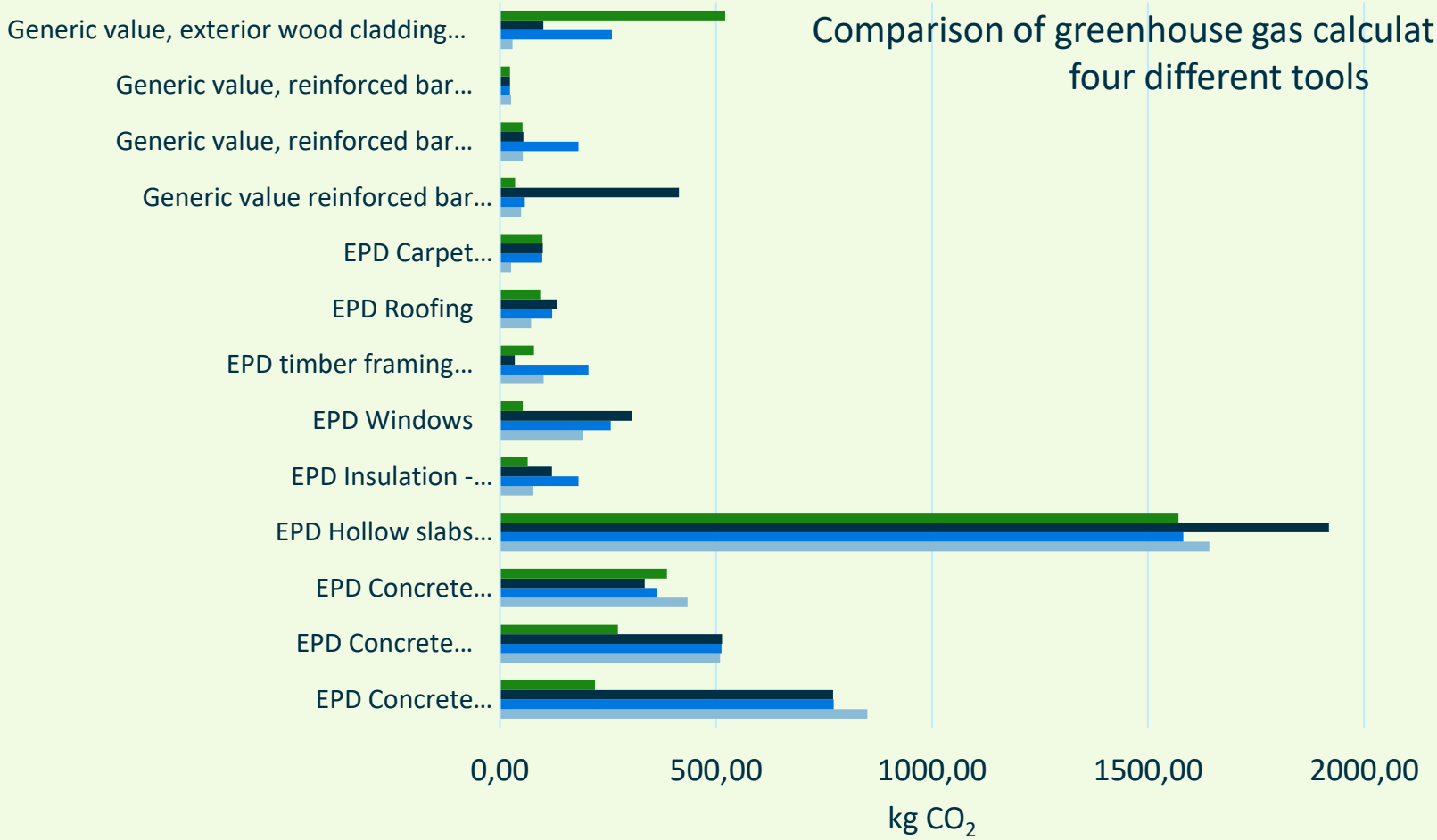
In 2023 we launched the report Klimagassutslipp fra byggematerialer that concluded

- The calculation tools for greenhouse gases are calculating different
- Probable reasons:
  - Transport distances and transport emissions
  - Lifetime
  - Replacement – values used
  - Generic values (sourced from various databases)

Currently conducting test calculations for five different LCA tools

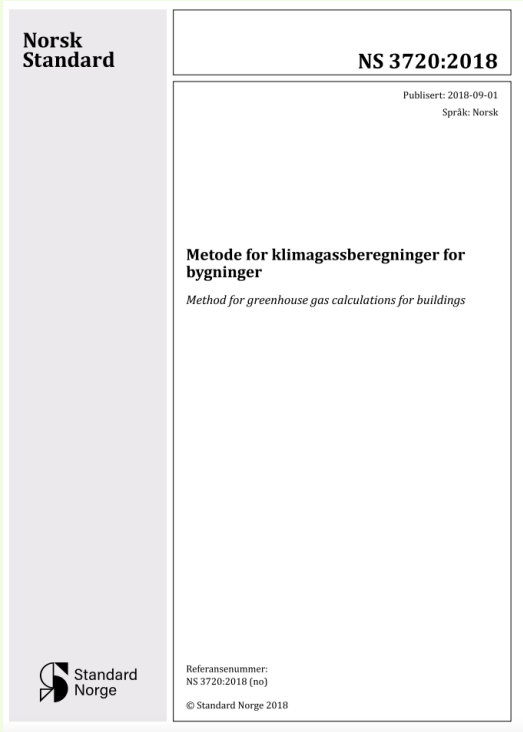
ILLUSTRASJON: RUSLAN NESTERENKO

Comparison of greenhouse gas calculations: A1-A3, four different tools



NS 3720:2018 Method for greenhouse gas calculations for buildings – guidance

- Currently developing a guide to the standard on how to calculate:
  - Maintance intervals and technical lifetimes (B2 og B4)
  - Transport distances, vehicles and load factors
  - Energy
  - Construction site
    - Waste amounts
    - Construction equipments
  - End of life


Norsk Standard

NS 3720:2018

Publisert: 2018-09-01
Språk: Norsk

Metode for klimagassberegninger for bygninger

Method for greenhouse gas calculations for buildings

Standard Norge

Referansenummer:
NS 3720:2018 (no)

Thank you

Ingunn Marton

Senior Engineer

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Boverket

Swedish National Board of Housing,
Building and Planning

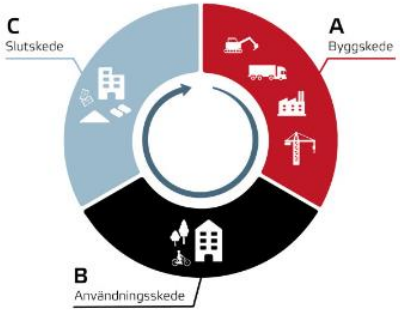
Experiences from decided climate regulation in Sweden

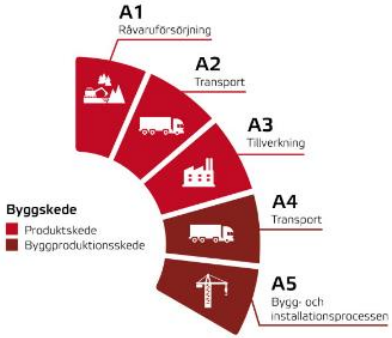
Kristina Einarsson

Regulation from January 2022

Climate declaration for new buildings

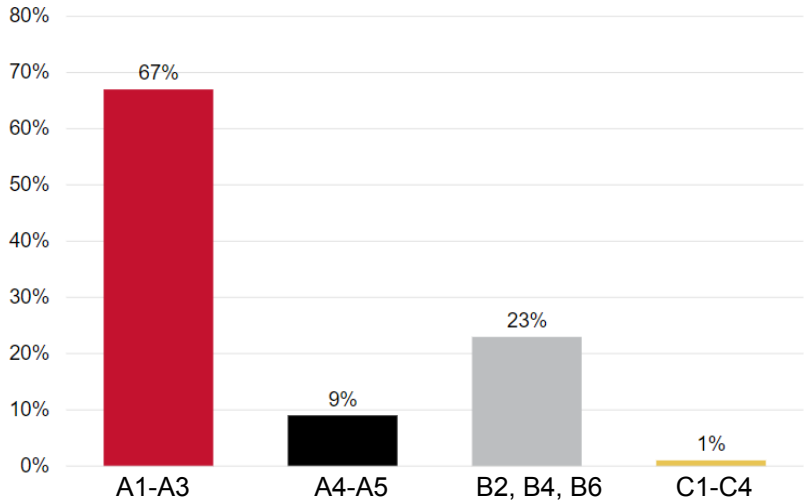
- Applies to new buildings
- The developer is responsible to register a climate declaration at Boverket before final clearance from the municipality.
- Climate impact from **all** construction products in the buildings envelope, load-bearing structures and interior walls must be calculated.
- Climate impact from module A1-A5 in kg CO_2e/m^2 GFA is included.





Climate declarations from 2022

- Starting point – start calculating as a first step (learning process)
- **Limited to parts that has the greatest climate impact**
- Introduce rules that are reasonable
- Make it easier, good quality calculations, the state is responsible updated generic climate database.
- Introduce limit values later.
- Roadmap published 2020 presenting the next step of regulation with limit values.
- Report to Government 2023 with legal proposal for limit values



Construction of the regulation

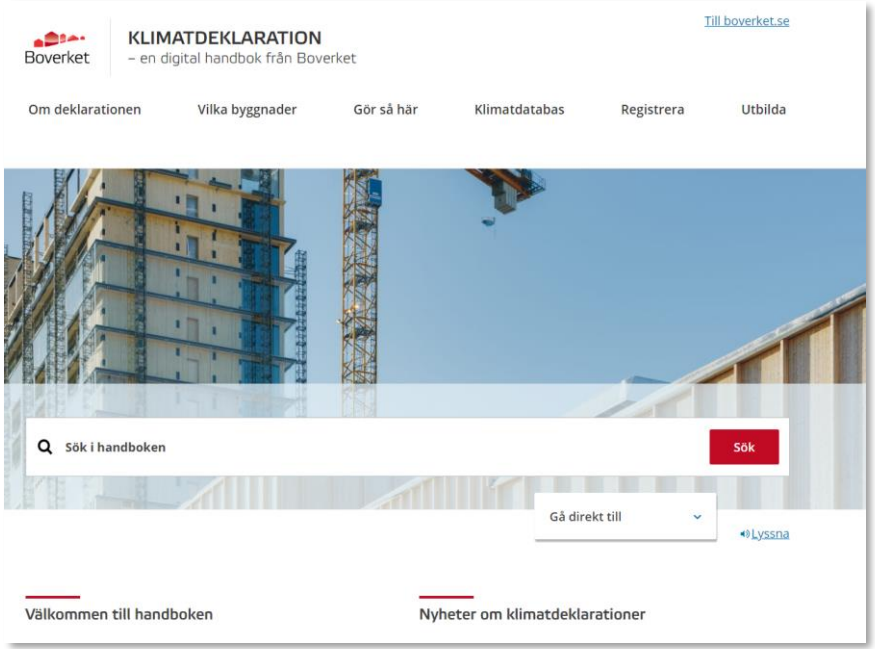
- A **separate set of regulations** for climate declarations (not in the building code).
- Climate declarations submitted to a **national** authority (Boverket)
- A **national register** with the submitted climate declarations.
- **National supervision** (Boverket) the submitted climate declarations.
- In this way, the state can follow the outcome **closely** and it is collected in one place.
- The regulation contains also sanctions if the regulation is not fulfilled.

Illustration: Infab

Experiences – works well

Digital handbook climate declaration

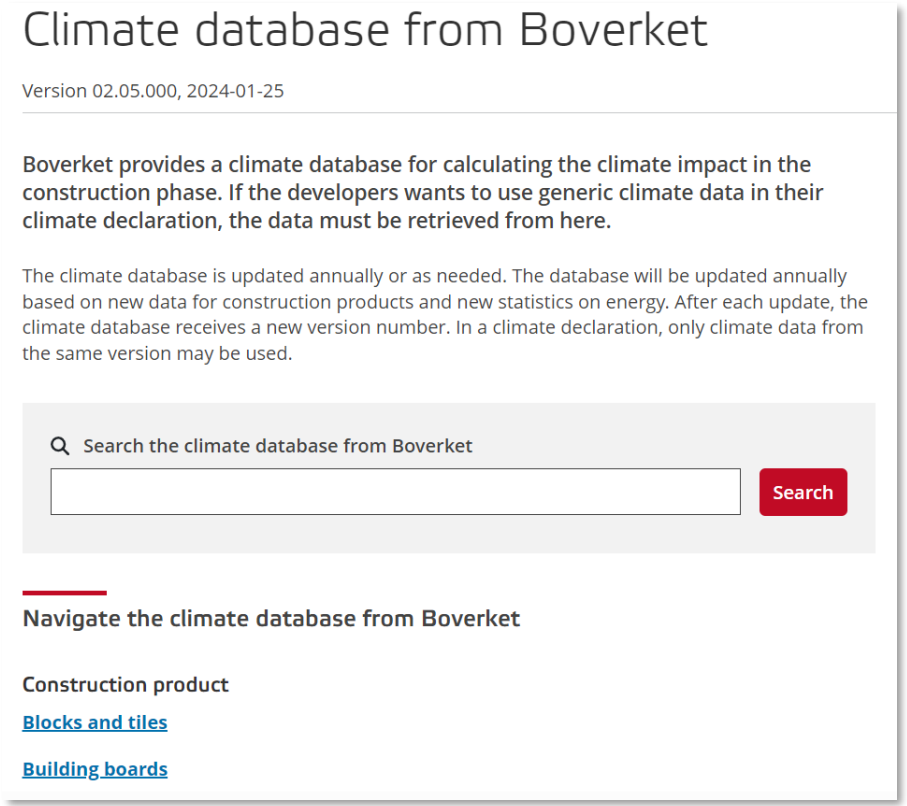
- Guidance on application of regulation
- Everthing is gathered in one place
- Much used and appreciated



Experiences – works well

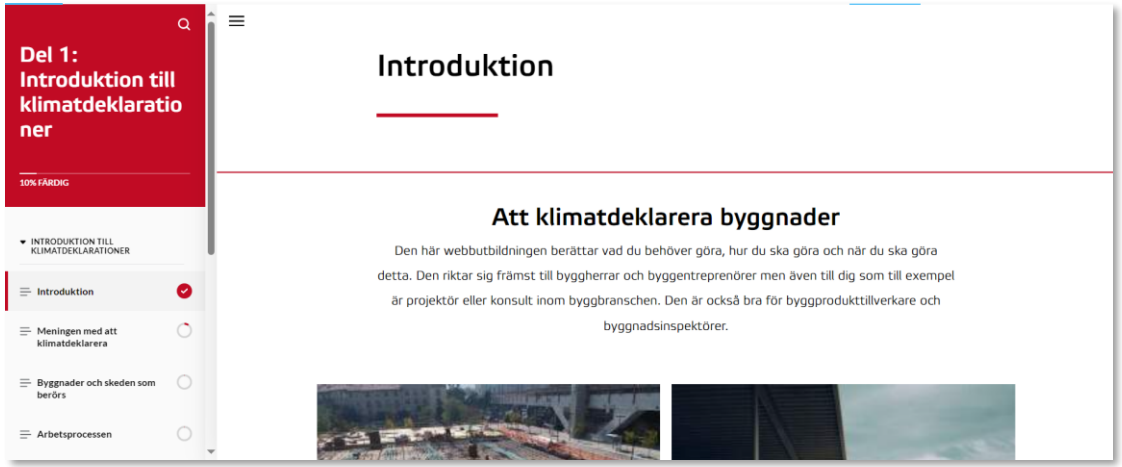
Climate database with generic data

- Generic climate data must come from this database
- More than 200 resources for construction products, energy and fuel
- **Conservative values** for construction products
- Climate data for **energy** and **fuels** must be retrieved from here
- Collaboration with FIN
- Annual updates
- EPDs has increased since publication of the database
- Much used and appreciated



Experiences – works well

- E-learning in the handbook
- Gives a quick introduktion to the regulation
- Much used and appreciated



Boverket´s control of climate declarations

- **Municipality** check **registration** climate declaration before a final clearance is issued
- **Boverket** oversee the climate declaration **complies** with the rules.
- About 10% of registered declarations reviewed yearly
- Boverket can request the **calculation basis** and **verification**

Two types of verification

- Verification of **purchased** construction products used in the building (**quantity** and **unit).**
- Verification of **specific** climate data (EPDs)

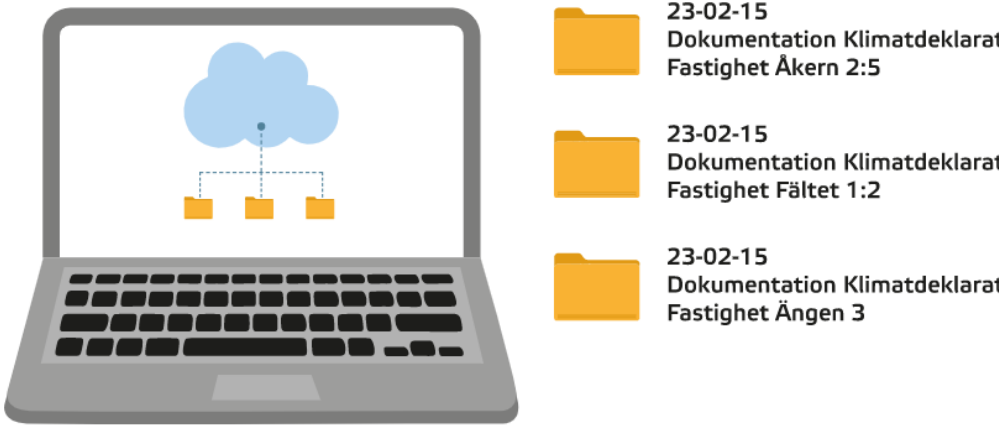
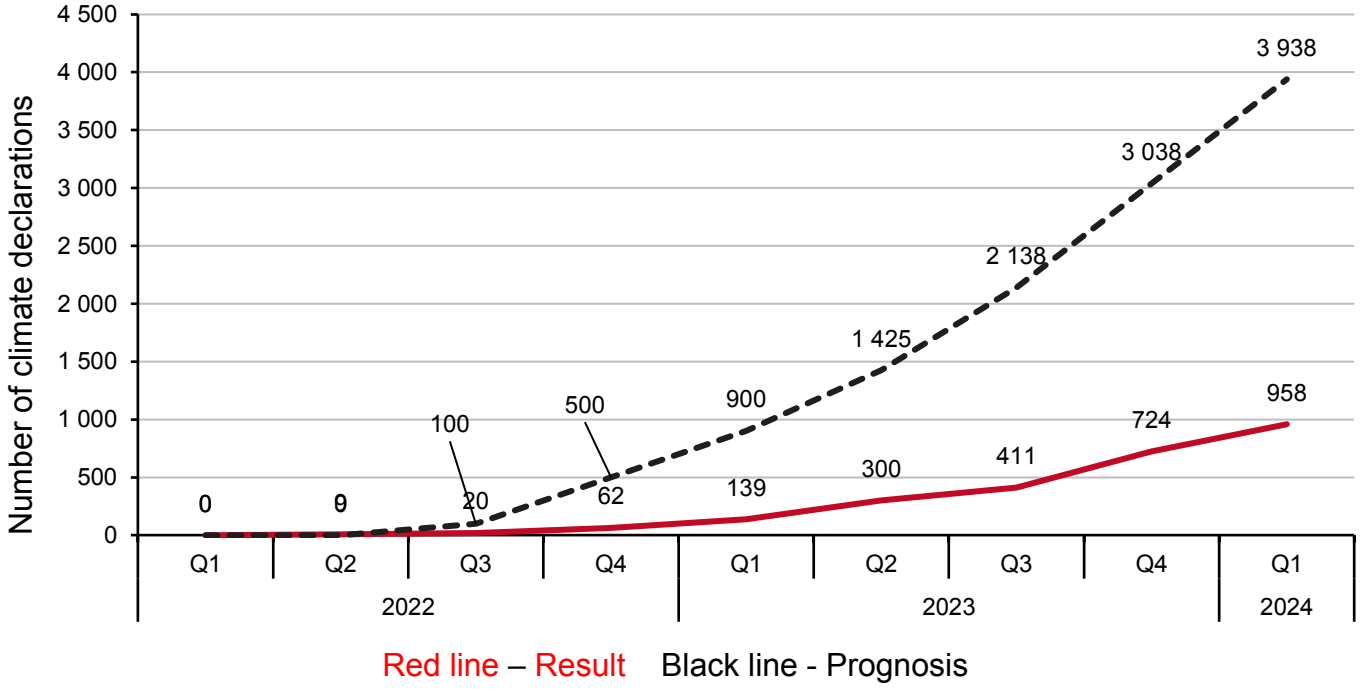


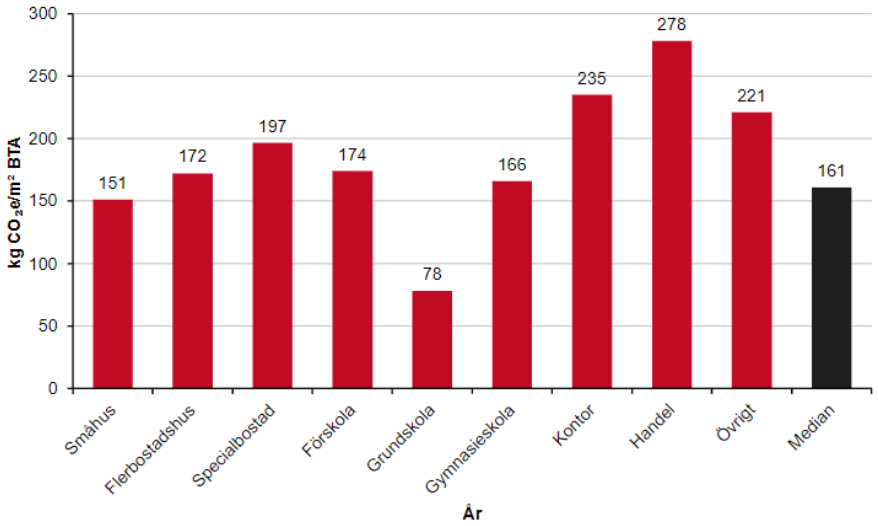
Illustration: Karin Weandin/Infab

Number of climate declarations in Boverket´s climate declaration register compared to the expected

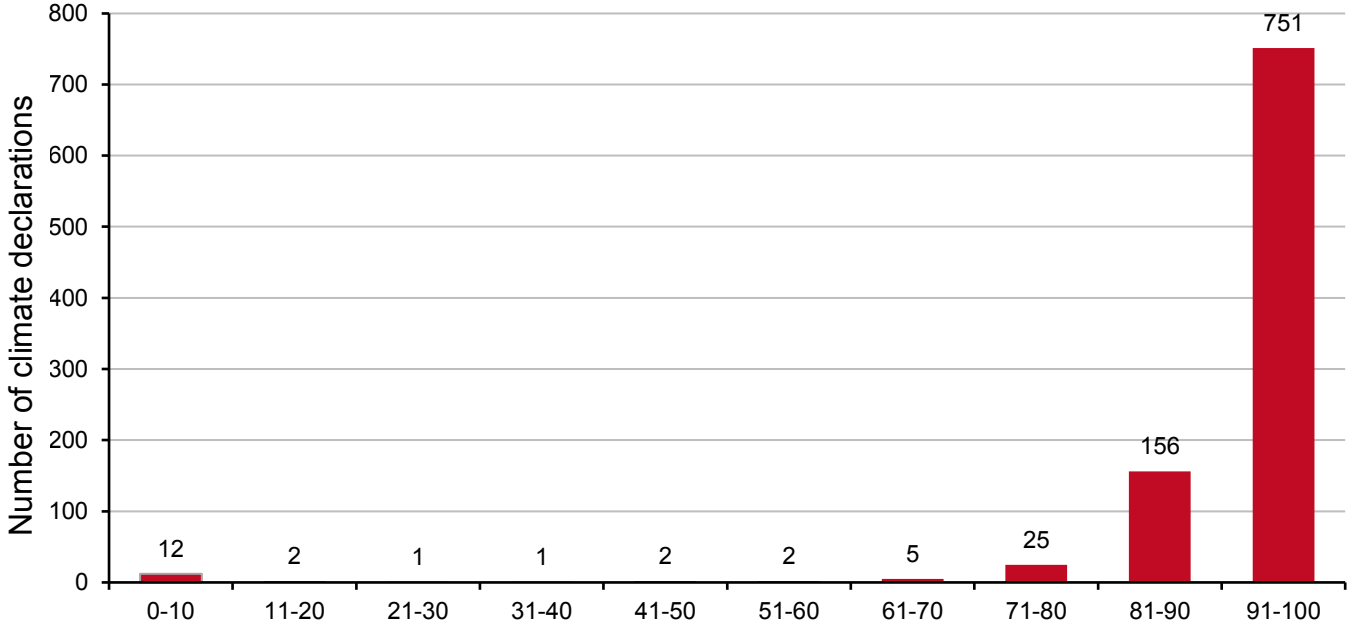


Statistics and follow-up

- Many climate declarations have surprisingly "low" declared values according to Boverket´s follow up of statistics in the climate declaration register
- An english webpage with statistics is planned to be published



Reporting on data gaps



Conclusion from the supervision

- A big learning process for a lot of stakeholders.
- Almost everything is new for both Boverket and the industry.
- Many climate declarations have surprisingly "low" declared values.
- There is **potential** to **streamline** a lot within climate declarations.
- A mandatory calculation template is needed.
- The main thing is that the regulations are followed.
- Boverket will **sharpen** the supervision from now.

More information

Information about climate declaration (ENG)

Climate declaration for new buildings - Boverket – Boverket

Roadmap from 2020

Regulation on climate declarations for buildings – Boverket

Report with legal proposals (ENG) from 2023

Limit values for climate impact from buildings and an expanded climate declaration – Boverket

Contact: kristina.einarsson@boverket.se