

# Zero Emission Buildings and The Research Centre on Zero Emission Neighbourhoods in Smart Cities

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- Ydalir, Elverum

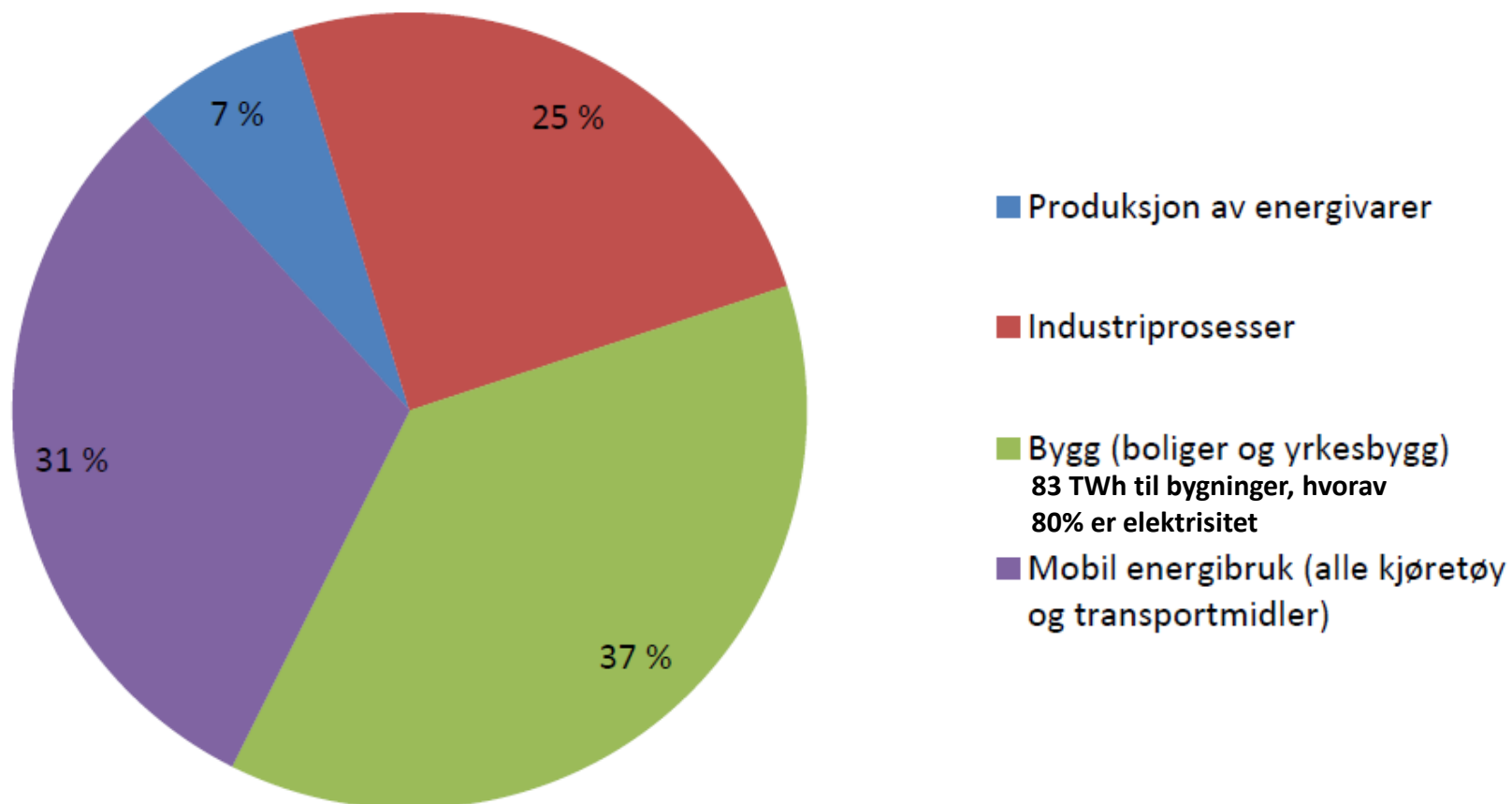


## Roadmap to a resource efficient Europe, 2011

- Better construction and use of buildings in the EU would influence 42% of our final energy consumption, about 35% of our greenhouse gas emissions and more than 50% of all extracted materials; it could also help us save up to 30% water.
- Existing policies for promoting energy efficiency and renewable energy use in buildings therefore need to be further strengthened and complemented with policies for resource efficiency, which look at a wider range of environmental impacts across the life-cycle of buildings and infrastructure.
- <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0571&from=EN>

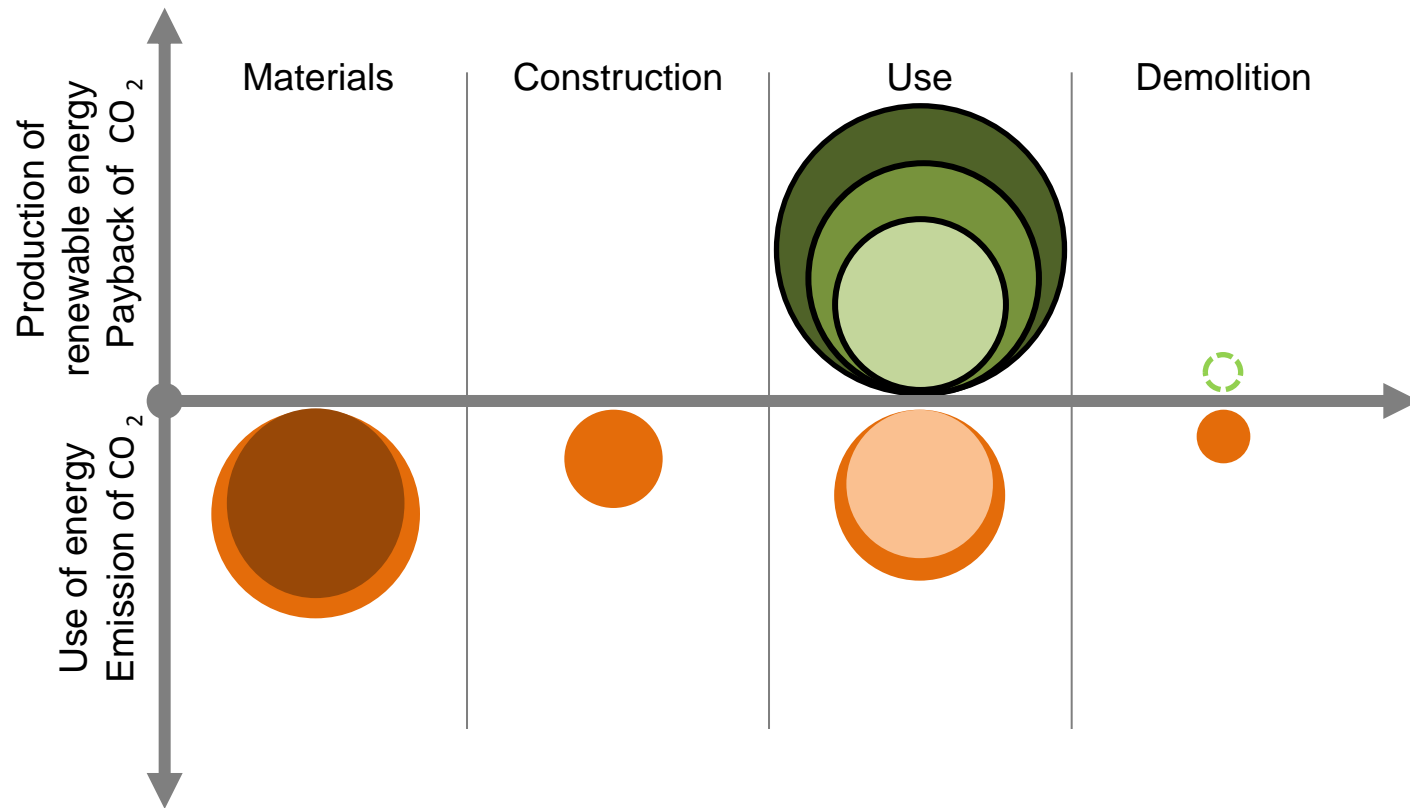


## Energy use in buildings in Norway

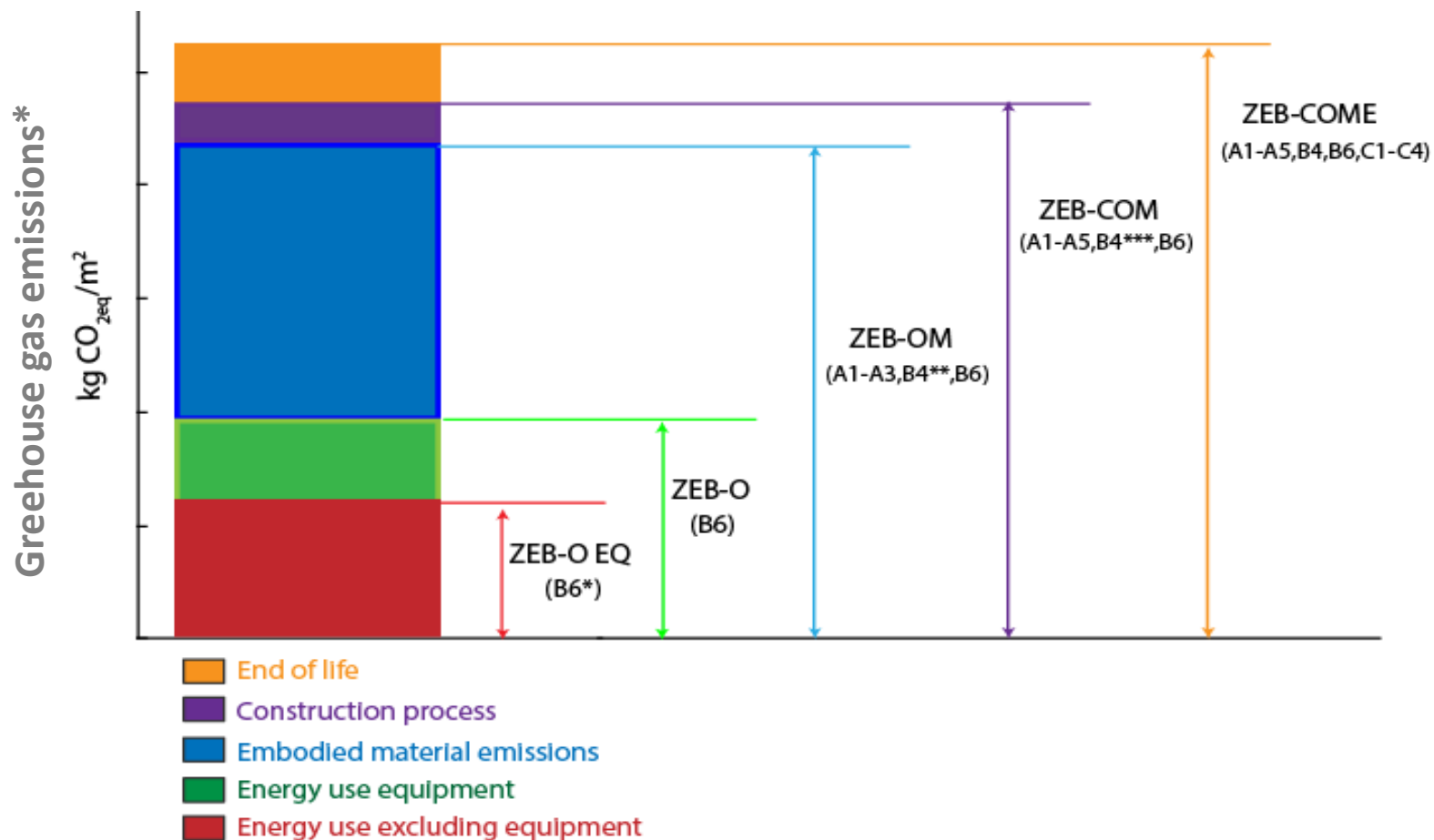


Source: Energibruk i Fastlands-Norge, NVE, 2011

# ZEB Definition (Zero Emission Buildings)



# Different levels of ambition for ZEB



\* Greenhouse gas emissions are calculated as kg CO<sub>2</sub>-equivalents per m<sup>2</sup> heated floor area per year (distributed over a 60 years life time)

# Zero emission demonstration buildings



The Research Centre on  
Zero Emission Buildings

[www.zeb.no](http://www.zeb.no)





THE RESEARCH CENTRE ON  
ZERO EMISSION  
NEIGHBOURHOODS  
IN SMART CITIES



**VISION:**  
**«Sustainable  
neighbourhoods with  
zero greenhouse gas  
emissions»**

## ZEN Centre Facts

- Host: Norwegian University of Science and Technology - NTNU
- Research partners: SINTEF Building and Infrastructure and SINTEF Energy Research
- Funding from 32 user partners, Research Council of Norway, NTNU and SINTEF
- Start date: Announced in May 2016, contract signed February 2017
- Total budget: Ca. 380 MNOK (2017 – 2024)
- Approximately 20 PhD candidates and 5 post docs will be hired



# PARTNERS

## 10 PUBLIC PARTNERS

Oslo  
Bergen  
Trondheim  
Bodø  
Elverum  
Steinkjer  
Sør-Trøndelag fylkeskommune  
NVE  
DiBK

## 2 RESEARCH PARTNERS

NTNU Sintef

## 20 INDUSTRY PARTNERS

ByBo	Norsk Fjernvarme
Elverum	NTE – Nord-Trøndelag
Tomteselskap	Energiverk
TOBB	Hunton
Snøhetta	Moelven
Reinertsen	Norcem
Asplan Viak	Numascale
Multiconsult	Smart Grid
SWECO	Services Cluster
Civit	Skanska
FutureBuilt	GK
Energi Norge	Caverion

# WORK PACKAGES

① WP1 Analytical framework for design and planning of ZEN

② WP2 Policy measures, innovation and business models

③  
WP3  
Responsive and  
energy efficient  
buildings

④  
WP4  
Energy flexible  
neighbourhoods

⑤  
WP5  
Local energy system  
optimization within  
a larger system

⑥ WP 6 Pilot projects and living labs

## Pilot Projects/Living Labs

**Oslo:** Furuset

**Bergen:** Zero Village Bergen

**Elverum:** Ydalir

**Trondheim:** Knowledge Axis, Sluppen (NTNU Campus)

**Bodø:** Airport area

**Steinkjer:** Residential area

**Evenstad:** Campus

Population of 30 000 people

Built floor area of more than 1 million m<sup>2</sup>

ZEB Flexible Lab office building, NTNU Campus

ZEB Living Lab residential building, NTNU Campus

