Green Buildings and Labelling in Sweden

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Definition low-energy buildings in this presentation

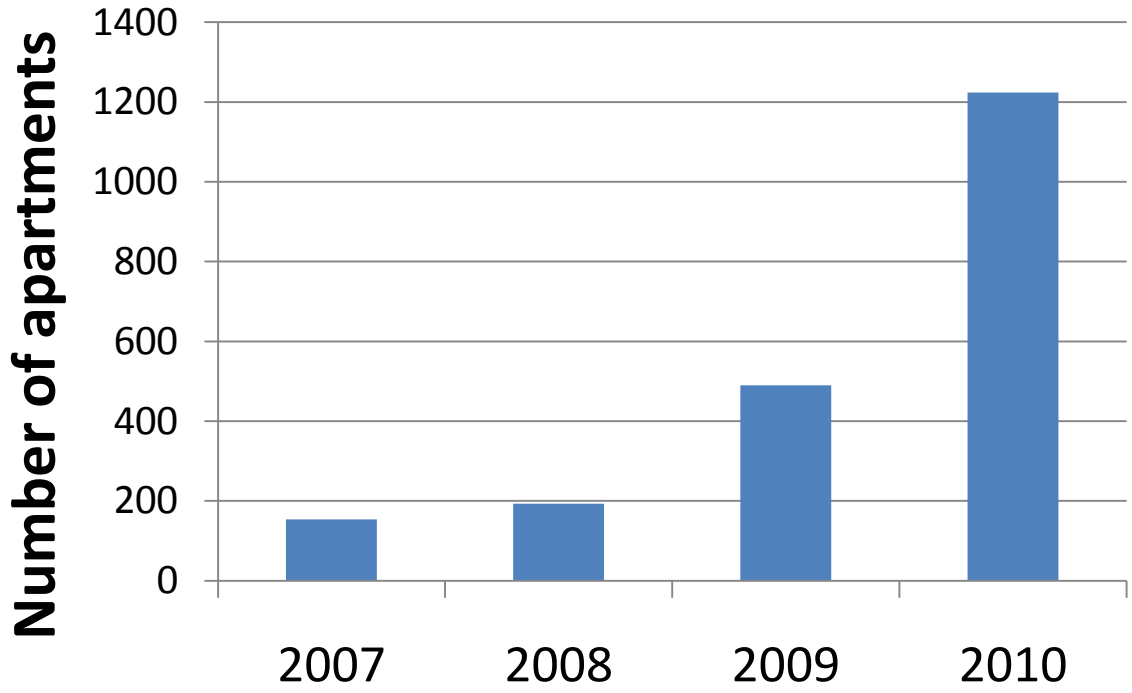
25% lower than applicable national building code

Development of low energy multifamilyhouses

2000
New: Jöns-Ols, Lund
Retrofit: Gårdsten, Göteborg

2006 - 2007
New: Oxtorget, Värnamo
New: Frillesås, Kungsbacka
New: Seglet, Karlstad

2008
New: Hamnhuset, Göteborg
Retrofit: Brogården, Alingsås



New record 2010

the proportion of low-energy apartments accounted for **11.2**% of total newbuild apartment

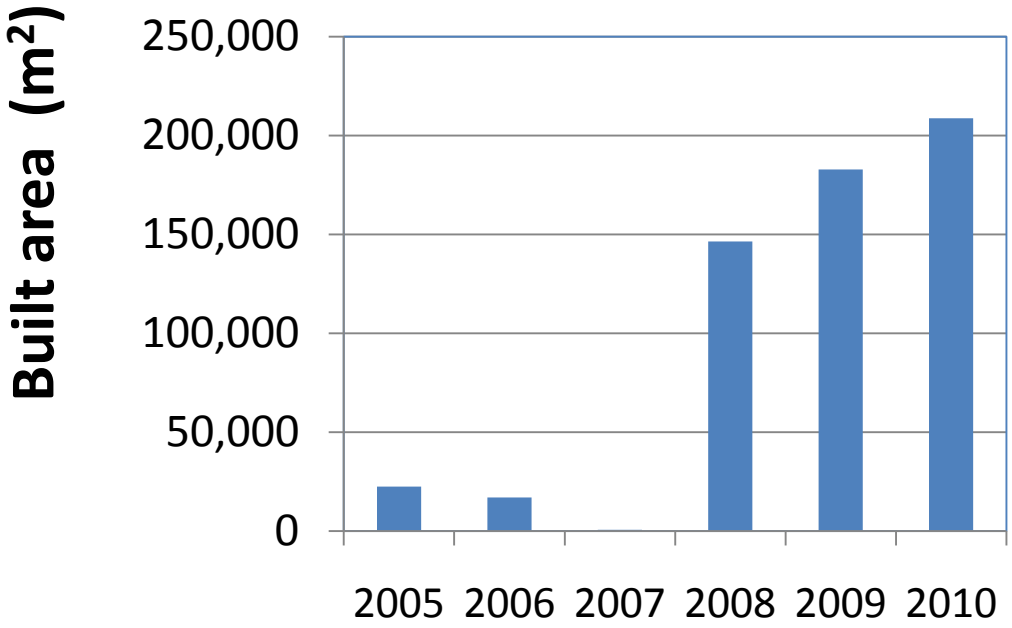
Today

Over 3300 apartments in over 73 multifamilyhouses

Energy use (kWh/m^2 A_{temp})	Number of apartments	Propotion (%)
$> E_{BR}$	80	4
$> 0{,}75\ E_{BR}$	1012	52
$> 0{,}50\ E_{BR}$	800	41
$> 0{,}25\ E_{BR}$	68	3

Swedish Building Code

Type of building	Energy use (kWh/m²) Climate zone		
	I	II	III
Residential buildings with heating systems other than electric heating	150	130	**110**
Residential buildings with electric heating	95	75	**55**



New record 2009 and 2010

the proportion of commercial and similar premises built as low-energy premises amounting to 8% of total new built area

Commercial low-energy premises

Energy use (kWh/m² A_{temp})	Infant schools and schools	Univers-ities	Office	Care services, hotels	Sport, industry	Retail	Total number	Propor-tion (%)
> E_{BBR}	1	1		1	0	0	3	**4**
> 0,75 E_{BBR}	18	5	27	3	2	4	59	**76**
> 0,5 E_{BBR}	10		2	1	1	1	15	**19**
> 0,25 E_{BBR}	1			0	0	0	1	**1**
Total	**30**	**6**	**29**	**5**	**3**	**5**	**78**	

Swedish Building Code

Type of building	Energy use (kWh/m²) Climate zone		
	I	II	III
Commercial and similar premises with heating systems other than electric heating	140 + 110 x (*q* – 0,35)	120 + 90 x (*q* – 0,35)	**100** + 70 x (*q* – 0,35)
Commercial and similar premises with electric heating	95 + 65 x (*q* – 0,35)	75 + 55 x (*q* – 0,35)	**55** + 45 x (*q* – 0,35)

Environmental labelling systems

Miljöbyggnad

-environmental building

P-markning

Svanen -Ecolabel

Requirements for passive houses

GreenBuilding

Swedish Standard SS-24300

BREEAM (NCC)

LEED (Skanska)

CIT Energy Management AB
A Chalmers Industriteknik Company

MILJÖ BYGGNAD
CERTIFIERAD | SVERIGE

All buildings

Three aspects

Energy

Indoor environment

Chemical substances

Score	Energy use (kWh/m^2)
Bronze	$> E_{BR}$
Silver	$> 0{,}75\ E_{BR}$
Gold	$> 0{,}65\ E_{BR}$

The European GreenBuilding Programme

Commercial buildings

	Energy use (kWh/m²)
New construction	> 0,75 E_{BR}
Retrofit	Reduce energy use with 25%

Requiremnts for passive houses

Residential buildings, infant schools and schools

Climate zone	Requirement Maximum heating power (W/m^2)	Recommendation Energy use (kWh/m^2)
III	10	$> 0{,}45\ E_{BR}$

Certifierat	Verifierat
PASSIVHUS	PASSIVHUS
FEBY krav 2009	FEBY krav 2009

2008
Passive house principle

New construction of kinder garten in Alingsås

Retrofit of Vargbro school in Storfors

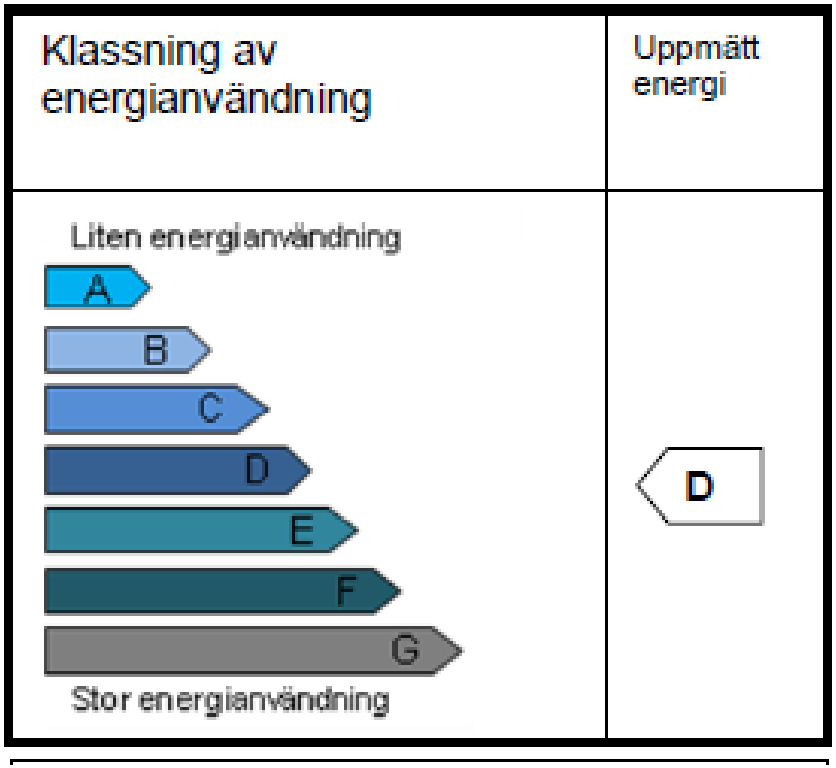
Labelled low-energy new constructions

	Performance specification for passive houses	GreenBuilding	Miljöbyggnad	LEED
Detached houses	6			
Apartment buildings	6			
Offices		26	1	3
Universities		1	1	
Health care etc.		2	1	
Retail		4		
Hotels		1		
Sports		1		
Industry		2		
Total	**12**	**37**	**3**	**3**

Energy certificate –EPBD directive

- all buildings
- measured energy use

Swedish standard SS-24300



Class	Energy Use kWh/m²
A	0,5 E_{BR} <
B	0,75 E_{BR} <
C	1,0 E_{BR} <
D	1,25 E_{BR} <
E	1,50 E_{BR} <
F	1,75 E_{BR} <
G	> 1,75 E_{BR}

New building code in October 2011

Type of building	Energy use (kWh/m²) Climate zone		
	I	II	III
Residential buildings with heating systems other than electric heating	130	110	90
Commercial and similar premises with heating systems other than electric heating	120 + 110 x (q – 0,35)	100 + 95 x (q – 0,35)	80 + 70 x (q – 0,35)

Building code in 2020

Type of building	Energy use (kWh/m²) Climate zone		
	I	II	III
Residential buildings with heating systems other than electric heating	65	55	45
Commercial and similar premises with heating systems other than electric heating	60 + 110 x (q – 0,35)	50 + 95 x (q – 0,35)	40 + 70 x (q – 0,35)