

Norway

Impact, compliance and control of legislation of EPBD in Norway



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Norway – Status

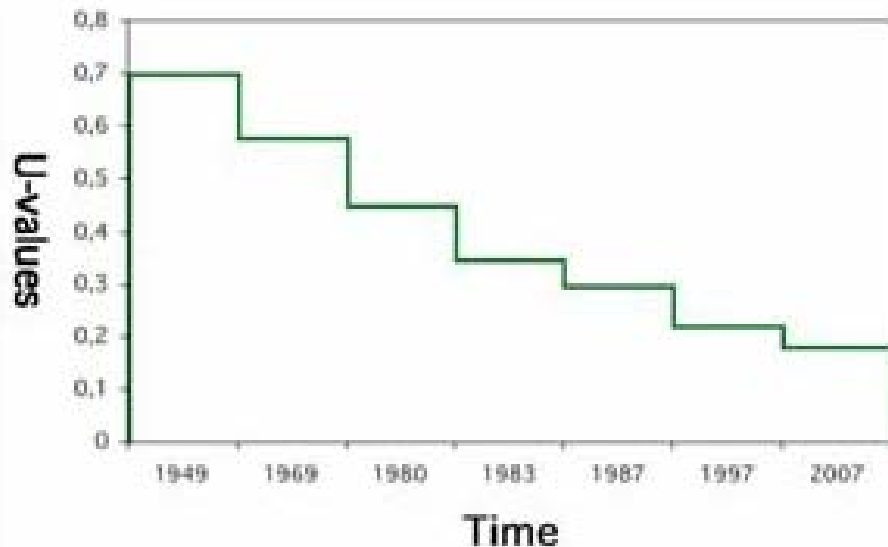
Status of EPBD implementation, autumn 2009

- *EP calculation standard:* Completed 2007
- *Building regulations:* Revised 2007
- *Energy Act:* Enforcement Jan. 2010
- *Labelling:* Partly. Complete in 2010
- *Inspection:* Expected 2010.

Norway – Regulations history



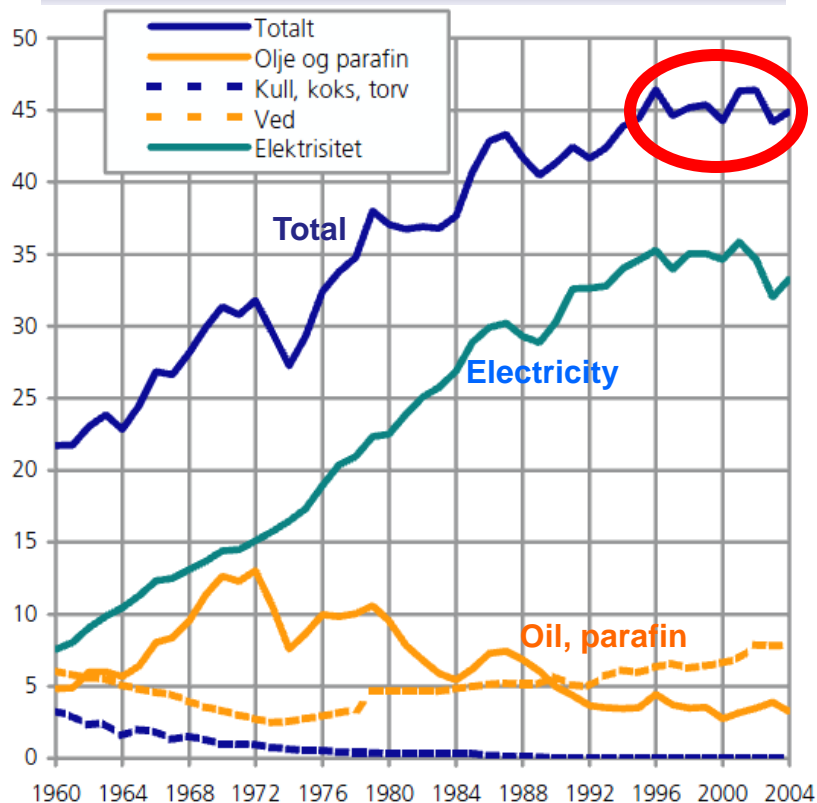
- Thermal insulation requirements since 1949
- Tightened at regular intervals, and more parameters added
- No direct effect on energy effectiveness up til 2009.



[Source: NVE, Norway]

Norway – Energy history

Housing [TWh]



Growth trends

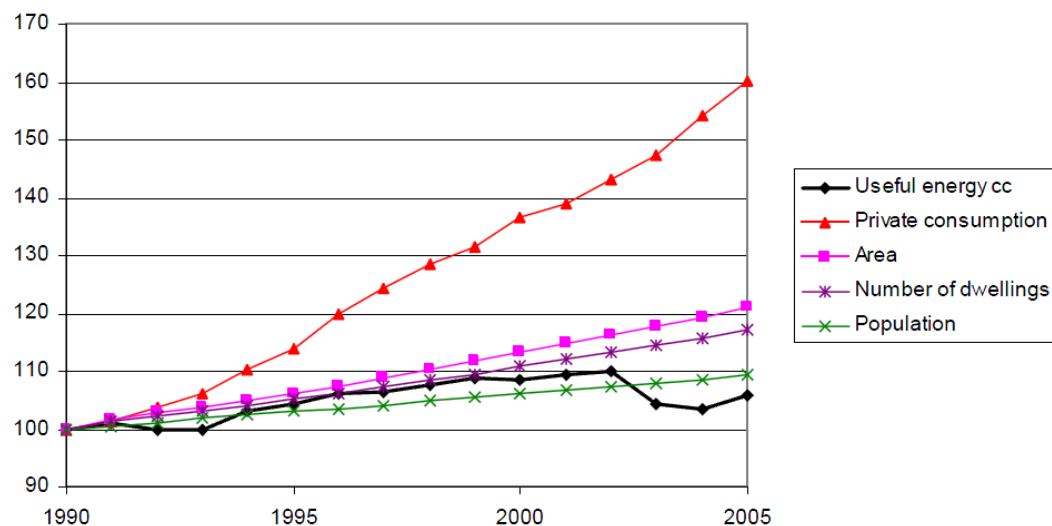


Figure 27 Trends in useful energy, private consumption, area, number of dwellings and resident population 1990-2005

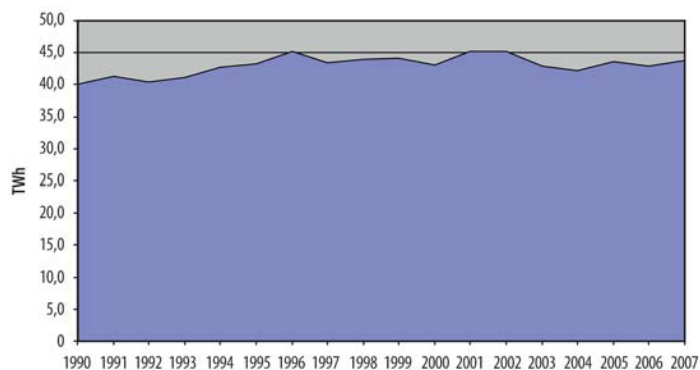
¹ Tallgrunnlaget til denne figuren finnes i vedleggstabell F3.

Kilde: Statistisk sentralbyrå energiregnskap og energibalanse.

Norway – Energy history

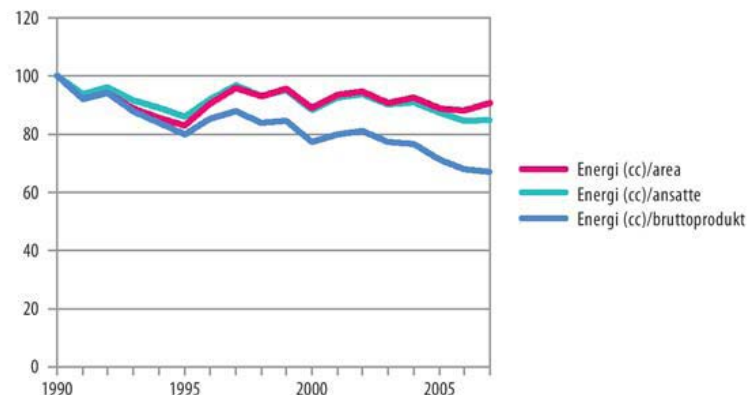
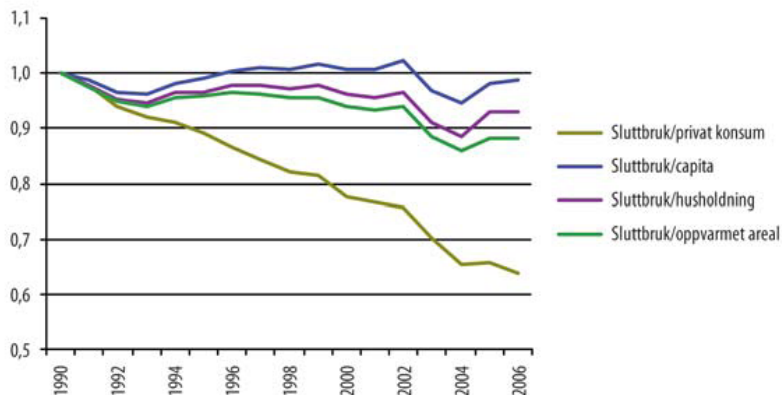
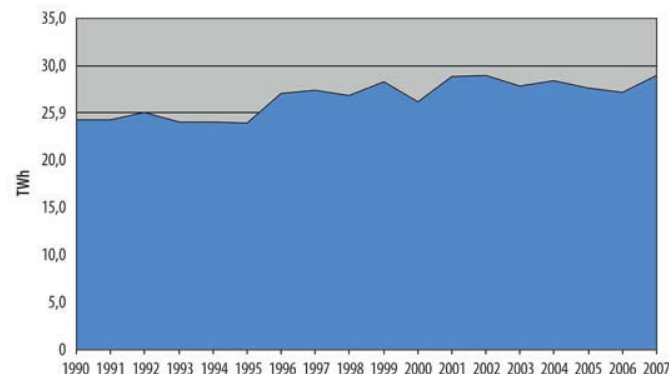
Housing, from 1990

Energibruk i boliger



Offices, from 1990

Energibruk yrkesbygg (eksklusiv industribygg)

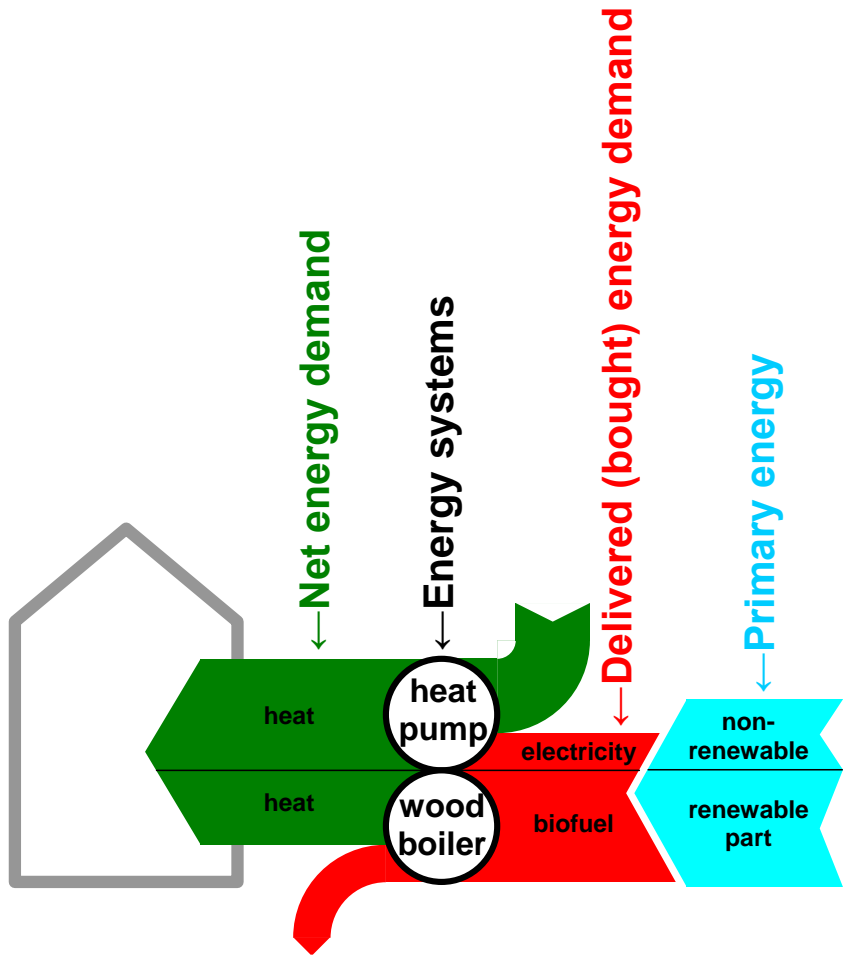


Preaccepted values: '97 to '07

Parameter	1997	2007
Wall U-value	0.22 W/m ² K	0.18 W/m ² K
Roof U-value	0.15 W/m ² K	0.13 W/m ² K
Floor U-value	0.30 W/m ² K	0.15 W/m ² K
Windows/doors	1.6 W/m ² K	1.2 W/m ² K
Thermal bridges	Included	0.06 [0.03*] (W/K)/m ² floor
Airtightness	-	$n_{50} = 1.5$ [2.5*]
Heat recovery	-	70 %
Specific fan power	-	2 [2.5*] kWh/(m ³ /s)
Glazing area	-	20 % of floor
Nighttime setback	-	19°C
Solar shading	-	sufficient to avoid cooling

* Special values for dwellings

2007 regulations



Old regulations		EPBD implementation			
1997 Simple prescriptive	1997 EP calculation	2007 / 2010 Simple prescriptive	2007 / 2010 EP calculation	2010 Energy labelling	2010 Inspections
1	7	1	13	13	-
■	■	■*	■*	■	
■	■	■*	■*	■	
	■	■*†	■*	■	■
		■	■	■	
	■	■	■	■	■
		■	■	■	■
■	■	■*	■*		
■	■	■*	■*	●	■
■	■	■†	■†	●	
		■†	■†	●	

Regulations impact

Special features of Norwegian approach

- **Regulations:** Net energy demand [kWh/m²·yr] & fixed int. gains; Renewable energy fraction (≥40%)
- **Labelling:** Delivered energy [kWh/m²·yr] & fixed int. gains; Secondary label: Renewable energy fraction



Long-term facade quality

Pros	Cons
Energy label independent of user behaviour	- Less credit for low-energy internal gains. - Less credit for ventilation, heat pumps

Other impacts of regulations



Impact on building performance

- Energy performance is improved by approx 25%
- Summertime temperatures: Increased risk

Market effects

- Initial concern has quietened, e.g. window manufacturers
- Extra investments payback 4½~9 years depending on building
- Increased interest in facade quality, e.g. airtightness
- Balanced ventilation with heat recovery now ‘standard’

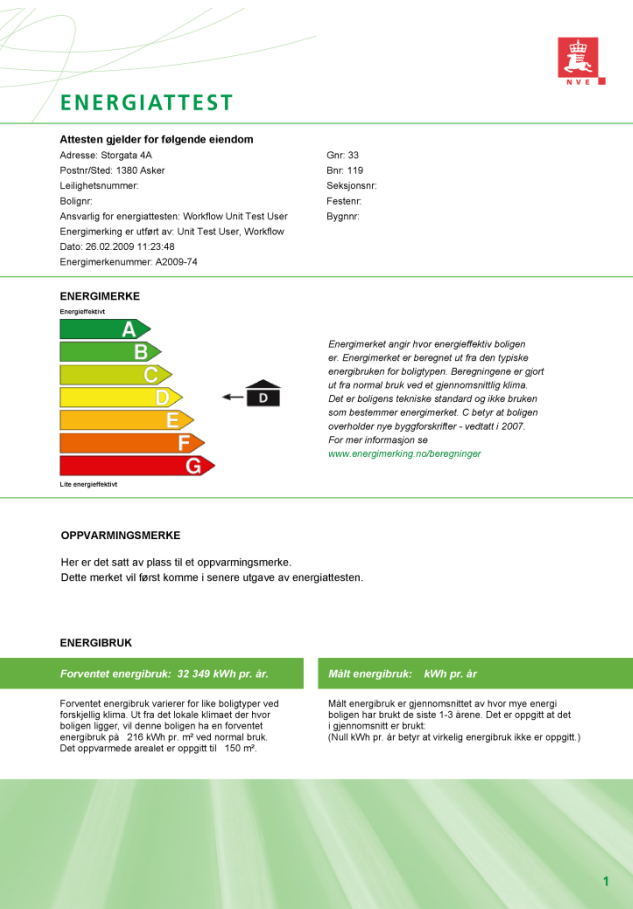
Compliance & control



Building permits

- **Software:** Any that conforms to national standard (NS 3031:2007), or validated with EN 15265. 2-page output summary.
- **Permit applications:**
 - electronic to local municipality
 - basically an administrative check
 - no on-site visits presently
 - in practice, largely based on trust
- **Sanctions:**
 - Builders can miss permit etc.
 - Energy - generally not sanctioned.
 - Rehab projects usually get dispensation.

Labelling scheme



ENERGIATTEST

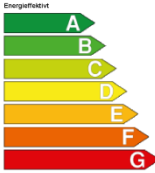
Attesten gjelder for følgende eiendom

Adresse: Storgata 4A
Postnr/Sted: 1380 Asker
Løslighetsnummer:
Bolignr:
Ansvarlig for energiattesten: Workflow Unit Test User
Energimerking er utført av: Unit Test User, Workflow
Dato: 26.02.2009 11:23:48
Energi merkenummer: A2009-74

Gnr: 33
Bnr: 119
Seksjonsnr:
Festnr:
Bygnnr:

ENERGIMERKE

Energieffektivitet



← D

Energi merket angir hvor energieffektiv boligen er. Energi merket er beregnet ut fra den typiske energibruken for boligtypen. Beregningene er gjort ut fra normal bruk ved et gjennomsnittlig klima. Det er boligens tekniske standard og ikke bruken som bestemmer energi merket. C betyr at boligen overholder nye byggeskrifter - vedtatt i 2007. For mer informasjon se www.energi merking.no/beregninger

Lite energieffektivitet

OPPVARMINGSMERKE

Her er det satt av plass til et oppvarmingsmerke. Dette merket vil først komme i senere utgave av energiattesten.

ENERGIBRUK

Forventet energibruk: 32 349 kWh pr. år. Målt energibruk: kWh pr. år

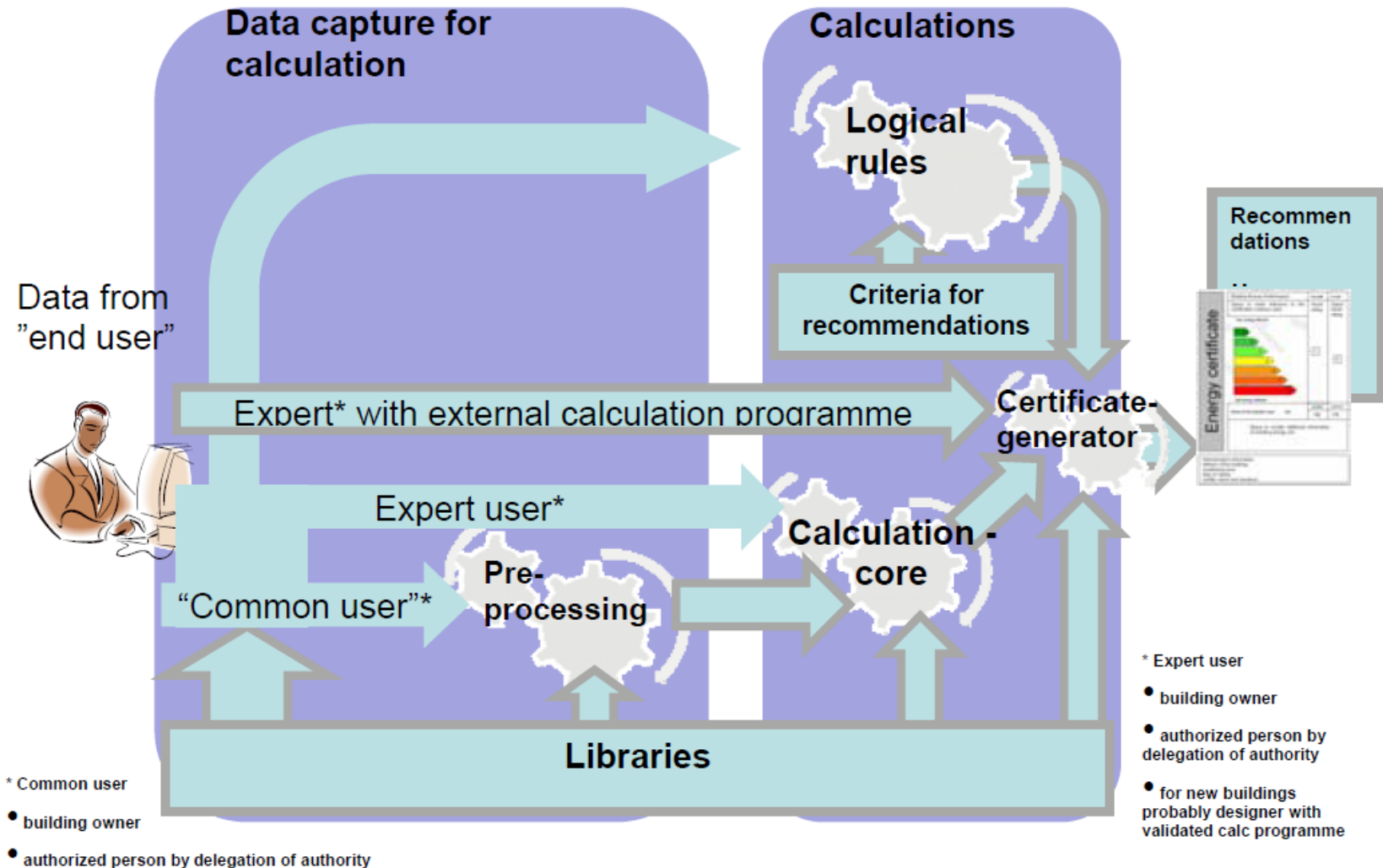
Forventet energibruk varierer for like boligtyper ved forskjellig klima. Ut fra det lokale klimaet der hvor boligen ligger, vil denne boligen ha en forventet energibruk på 216 kWh pr. m² ved normal bruk. Det oppvarmede arealet er oppgitt til 150 m².

Målt energibruk er gjennomsnittet av hvor mye energi boligen har brukt de siste 1-3 årene. Det er oppgitt at det i gjennomsnitt er brukt (Null kWh pr. år betyr at virkelig energibruk ikke er oppgitt.)

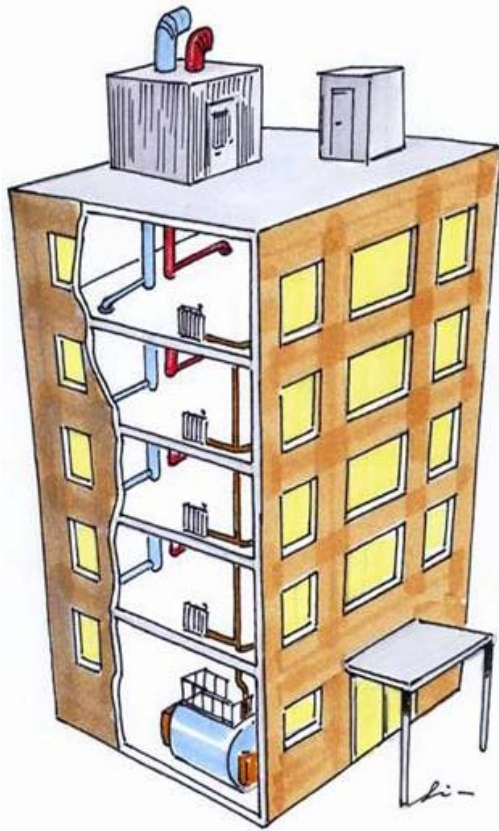
Key features

- National website with database: Single access point for labelling
- Free
- Two levels:
 - Dwellings: Building owner can do self !
 - Others: Must declare qualifications
- Automatic recommendation generator
- Online software, or can upload results from any validated software

Labelling scheme



Inspection scheme



3 types of inspection

- **Boilers:** 2-yearly for >100 kW, 4-yearly for >20 kW. 20 kW boilers require relevant competence with 2 years' experience from inspection & operation. 100 kW boilers: as above but 5 years' experience.
- **Heating systems:** One-off inspections of old (15 yr) heating systems with fossil-fuel boilers (>20 kW), requires HVAC competence at engineer-level (bachelor). & 2 years' experience from EP calcs.
- **AC/ventilation systems:** 5-yearly inspection (>12 kW nominal cooling capacity), require HVAC-related competence at engineer-level (bachelor) & 2 years' experience from installing or evaluating such systems.

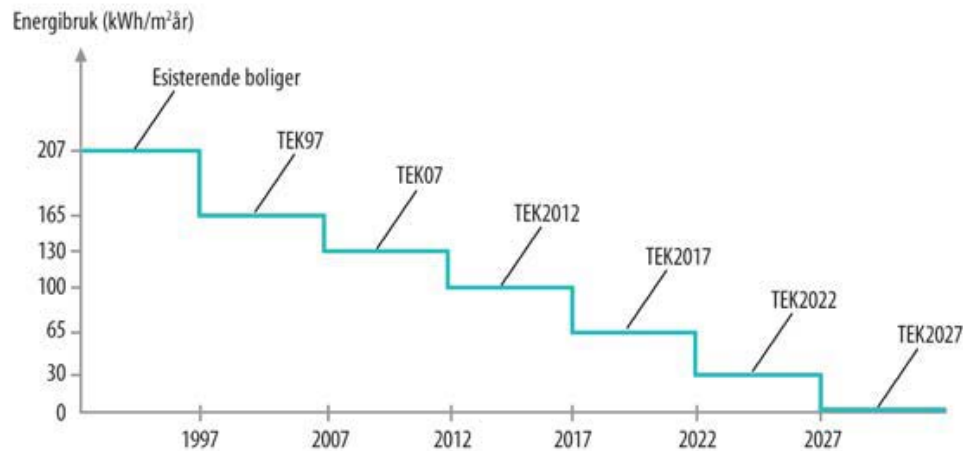
Compliance & control



Labelling scheme

- Building owner is responsible
- Motivated by wish to avoid civil litigation by buyers & tenants.
- Authorities can impose sanctions:
 - Spot checks of certificates & inspection reports.
 - Administrative fines

Suggested improvements



[Source: Lavenergiutvalg
2009, Norway]

- Forewarn of progressive tightening in regulations
- Coordinated economic measures: funds, housing bank
- Much stricter rules for dispensation for rehab. projects
- Energy certificates should have an “energy plan”
- White certificates (similar to UK & FR)

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