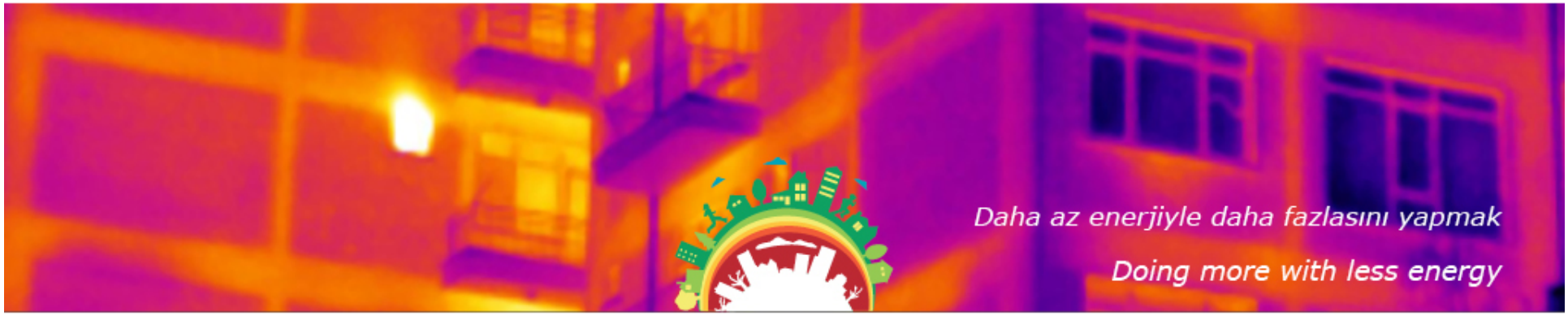
Bu proje Avrupa Birliği ve Türkiye Cumhuriyeti tarafından finanse edilmektedir.
This project is co-financed by the European Union and the Republic of Turkey

Binalarda Enerji Verimliliğinin Artırılması için Teknik Yardım Projesi
Technical Assistance for Improving Energy Efficiency in Buildings Project

Technical Issues

ENSI and DTI

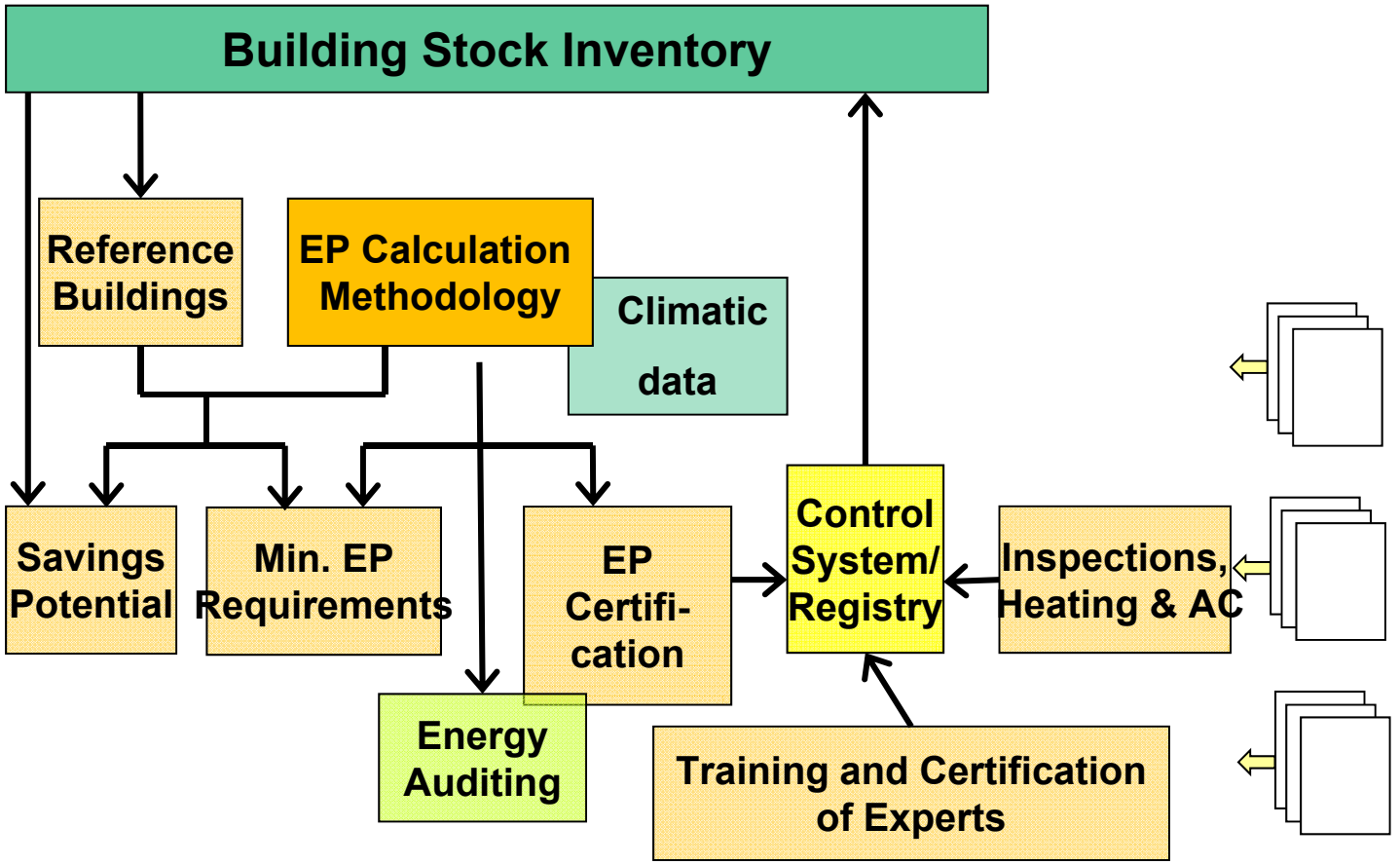
Nataliya Grytsenko (ENSI), Lars Olsen (DTI), Lars Thomsen Nielsen (DTI)



CFCU
NIRAS
T.C. ÇEVRE VE ŞEHİRCİLİK BAKANLIĞI

Bu proje Avrupa Birliği ve Türkiye Cumhuriyeti tarafından finanse edilmektedir.
This project is co-financed by the European Union and the Republic of Turkey

Overview



Bu proje Avrupa Birliği ve Türkiye Cumhuriyeti tarafından finanse edilmektedir.
This project is co-financed by the European Union and the Republic of Turkey

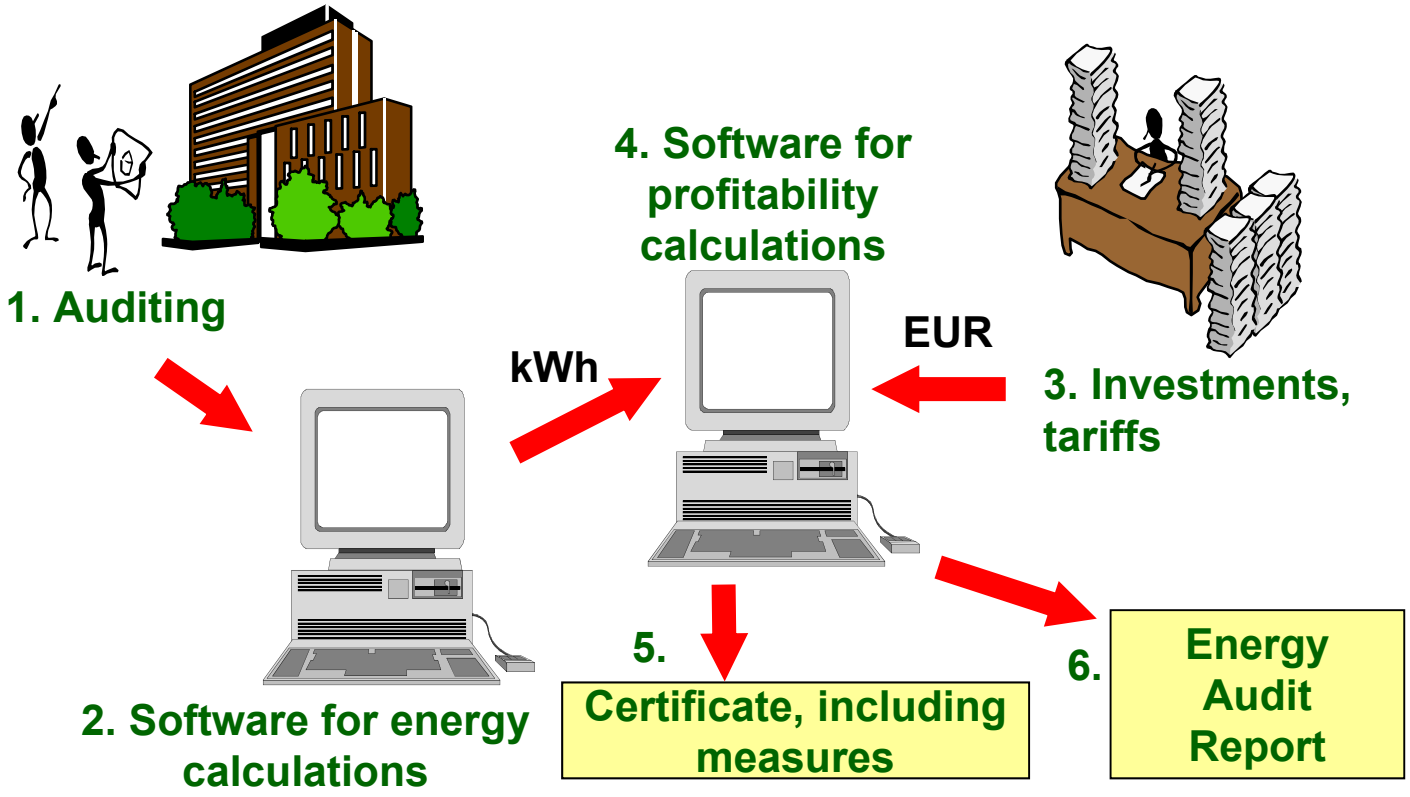
Technical issues

- Selection of calculation methodology for Energy Performance of Buildings
- Methodology for certification of apartments and single family houses buildings
- Rules for energy rating
- Technical requirements - minimum energy performance requirements (building envelope, systems, etc.) ***and how to check their compliance***
- Reference climatic data for determining the building energy performance….

Bu proje Avrupa Birliği ve Türkiye Cumhuriyeti tarafından finanse edilmektedir.
This project is co-financed by the European Union and the Republic of Turkey

Calculation

Norway: simple hourly data, Bulgaria + Denmark: monthly values

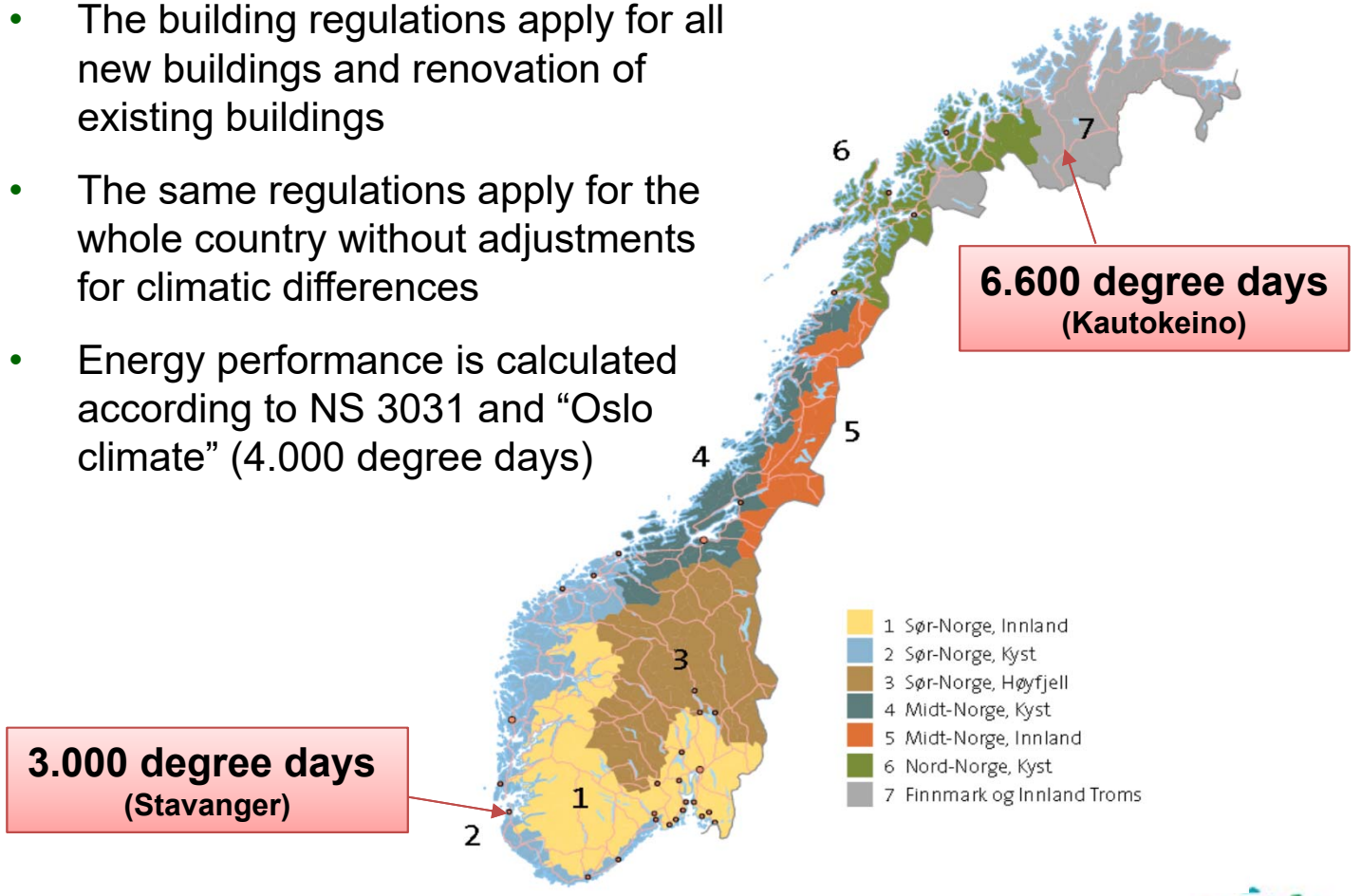


Bu proje Avrupa Birliği ve Türkiye Cumhuriyeti tarafından finanse edilmektedir.
This project is co-financed by the European Union and the Republic of Turkey

National Building Codes

Key features of Norwegian Building Codes

- The building regulations apply for all new buildings and renovation of existing buildings
- The same regulations apply for the whole country without adjustments for climatic differences
- Energy performance is calculated according to NS 3031 and “Oslo climate” (4.000 degree days)



Bu proje Avrupa Birliği ve Türkiye Cumhuriyeti tarafından finanse edilmektedir.
This project is co-financed by the European Union and the Republic of Turkey

Minimum Requirements

Besides overall energy performance indicators

- Requirements for building envelope
  - U-values,
  - thermal bridges
- Requirements for air exchange
  - infiltration
  - annual efficiency of heat exchanger in ventilation systems
- Specific fan performance (SFP)
- Boilers: It is not allowed to install boiler using oil to cover the base load (60–90% of total energy need). Oil is only allowed to cover peak load.
- Setback temperatures

Page 1 / 2

Bu proje Avrupa Birliği ve Türkiye Cumhuriyeti tarafından finanse edilmektedir.
This project is co-financed by the European Union and the Republic of Turkey

Minimum Requirements

Besides overall energy performance indicators

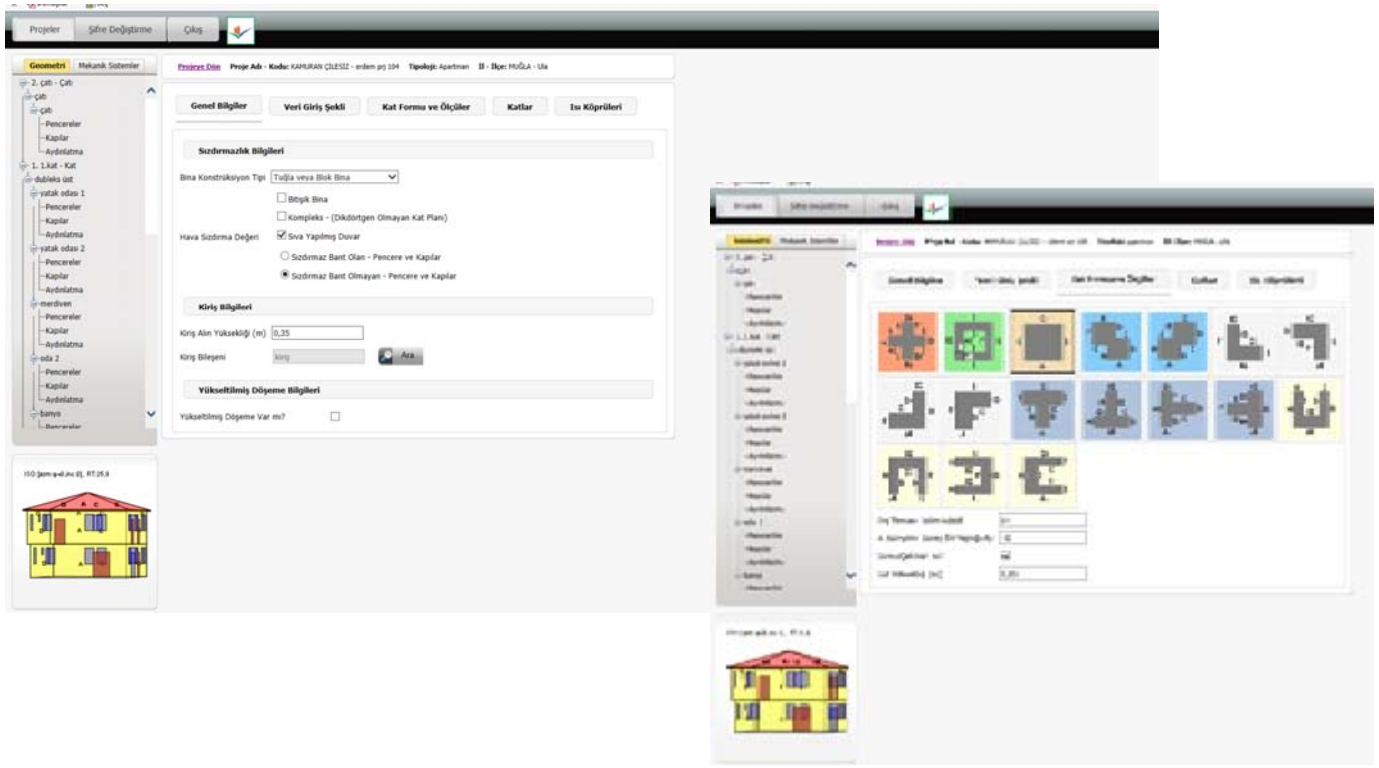
- Heat supply : In areas having a district heating, all new buildings must be equipped with systems that can utilise district heating .
- Renewable energy source: minimum 60% of the net energy need for heating is covered with other energy sources than direct electricity or fossil fuel
- Automatic control systems
- Energy efficient insulation for piping, equipment and ducts (for heating and cooling distribution systems)

Page 2 / 2

Bu proje Avrupa Birliği ve Türkiye Cumhuriyeti tarafından finanse edilmektedir.
This project is co-financed by the European Union and the Republic of Turkey

Programs

BEP-TR Çevirimiçi web programı



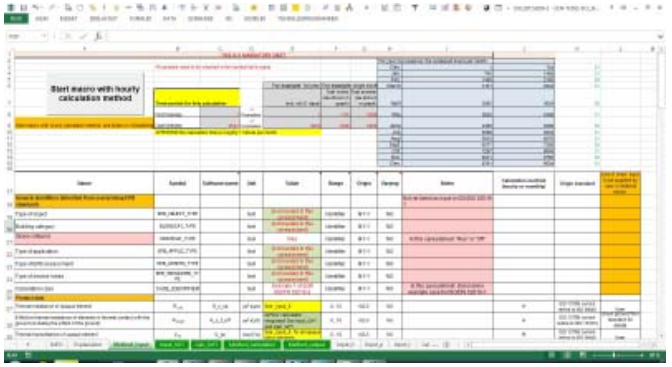
Page 1 / 3

Bu proje Avrupa Birliği ve Türkiye Cumhuriyeti tarafından finanse edilmektedir.
This project is co-financed by the European Union and the Republic of Turkey

Programs

CEN

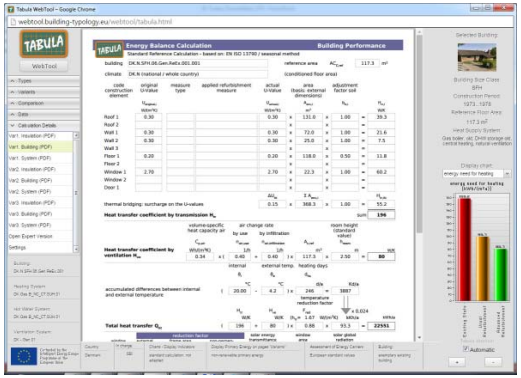
EN ISO/DIS 52016-1
Energy performance of buildings



Tabula

IEE Project TABULA (2009 - 2012)

Typology Approach for Building Stock Energy Assessment

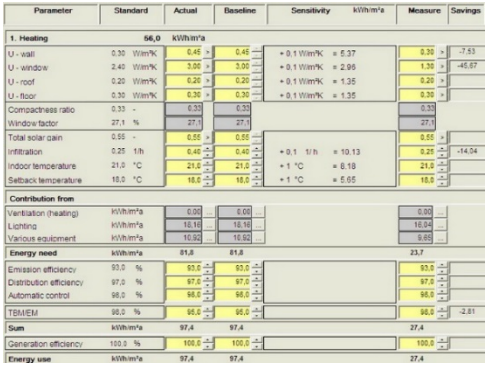


Bu proje Avrupa Birliği ve Türkiye Cumhuriyeti tarafından finanse edilmektedir.
This project is co-financed by the European Union and the Republic of Turkey

Programs

ENSI

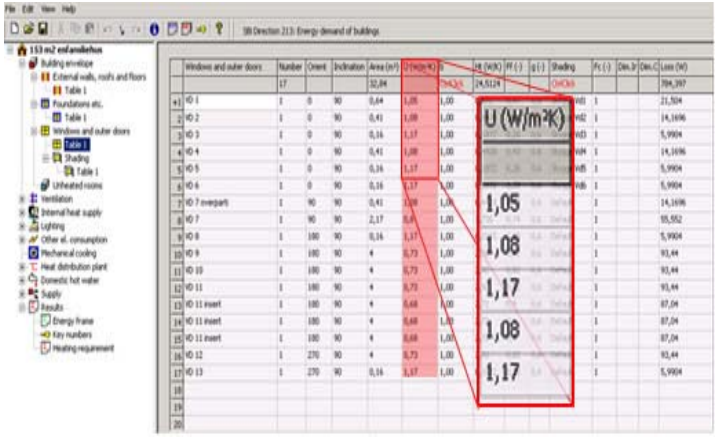
Energy Auditing of Buildings Software



BE10

SBI – instructions 213

Documentation according to Danish legislation and Energy labeling



Page 3 / 3

Bu proje Avrupa Birliği ve Türkiye Cumhuriyeti tarafından finanse edilmektedir.
This project is co-financed by the European Union and the Republic of Turkey

Experience

Energy labelling of houses

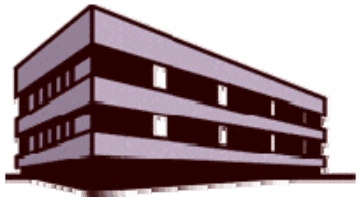
Required energy certificates in EU for:

- New buildings
- Existing buildings when rented or sold

Energy certificates is needed for:

Houses

Apartments



Offices

Page 1 / 4

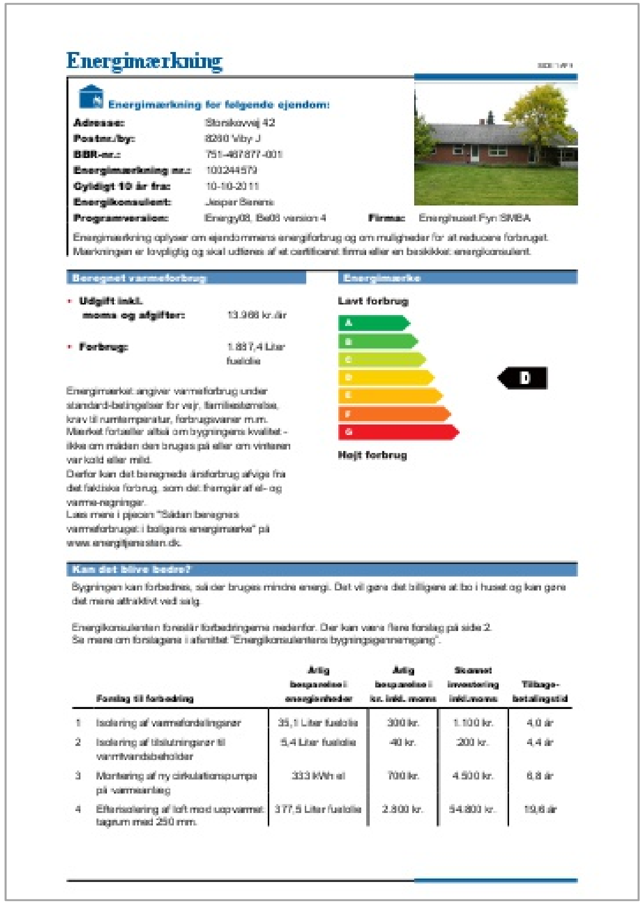
Bu proje Avrupa Birliği ve Türkiye Cumhuriyeti tarafından finanse edilmektedir.
This project is co-financed by the European Union and the Republic of Turkey

Experience

Energy labelling of houses

Inputs to Energy certificates

- External energy auditor (ex. Denmark and Germany)
- Registration by house owner (ex. Norway)



Energimærkning

Energimærkning for følgende ejendom:

Adresse:	Storskovvej 42
Postnr./by:	8260 Viby J
BBR-nr.:	751-487877-001
Energimærkning nr.:	100244579
Gyldigt 10 år fra:	10-10-2011
Energikonsulent:	Jesper Berens
Programversion:	Energy08, Be06 version 4 — **Firma:** Energhuset Fyn SMBA

Energimærkning oplyser om ejendommens energiforbrug og om muligheder for at reducere forbruget. Mærkningen er lovpligtig og skal udføres af et certificeret firma eller en beskikket energikonsulent.

Beregnet varmeforbrug

- **Udgift inkl. moms og afgifter:** 13.968 kr./år
- **Forbrug:** 1.887,4 Liter fuelolie

Energimærket angiver varmeforbrug under standard-betingelser for vejr, familiestørrelse, krav til rumtemperatur, forbrugsvaner m.m. Mærket fortæller altså om bygningens kvalitet - ikke om måden den bruges på eller om vinteren var kold eller mild.
Derfor kan det beregnede årsforbrug afvige fra det faktiske forbrug, som det fremgår af el- og varme-regninger.
Læs mere i pjecen "Sådan beregnes varmeforbruget i boligens energimærke" på www.energitjenesten.dk.

Energimærke

Kan det blive bedre?

Bygningen kan forbedres, så der bruges mindre energi. Det vil gøre det billigere at bo i huset og kan gøre det mere attraktivt ved salg.

Energikonsulenten foreslår forbedringerne nedenfor. Der kan være flere forslag på side 2.
Se mere om forslagene i afsnittet "Energikonsulentens bygningsgennemgang".

	Forslag til forbedring	Årlig besparelse i energienheder	Årlig besparelse i kr. inkl. moms	Skønnet investering inkl. moms	Tilbage-betalingstid
1	Isolering af varmefordelingsrør	35,1 Liter fuelolie	300 kr.	1.100 kr.	4,0 år
2	Isolering af tilslutningsrør til varmtvandsbeholder	5,4 Liter fuelolie	40 kr.	200 kr.	4,4 år
3	Montering af ny cirkulationspumpe på varmeanlæg	333 kWh el	700 kr.	4.500 kr.	6,8 år
4	Efterisolering af loft mod uopvarmet tagrum med 250 mm.	377,5 Liter fuelolie	2.800 kr.	54.800 kr.	19,6 år

Page 2 / 4

Bu proje Avrupa Birliği ve Türkiye Cumhuriyeti tarafından finanse edilmektedir.
This project is co-financed by the European Union and the Republic of Turkey

Requirements for a energy certificate

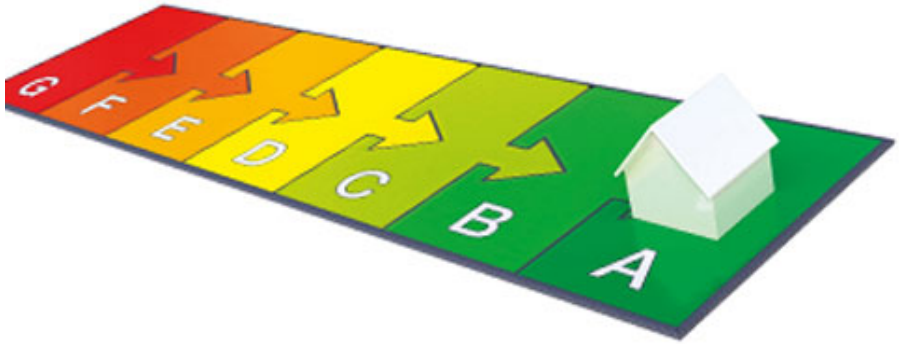
- A certified independent consultant has to:
  - Do a building audit
  - Calculate energy performance
  - Suggest energy saving measures
  - Make a certificate.

- Guidance rules available:
  - Simplification of input
  - Standard energy efficiencies of installations
  - Easy collection of data
  - Consistent certificates independent of consultant.

Bu proje Avrupa Birliği ve Türkiye Cumhuriyeti tarafından finanse edilmektedir.
This project is co-financed by the European Union and the Republic of Turkey

Experiences with energy labeling

- Encouragement to refurbish house
- Higher energy label can increase the house price
- Security for buyer to know about energy performance of a house



Contribution from ENSI and DTI

DANISH TECHNOLOGICAL INSTITUTE

ENSI Energy Saving International AS

Thank you for your attention