

Implementing the EU Energy Performance of Buildings Directive on Energy Certification

A method for existing non-residential buildings based on measured energy

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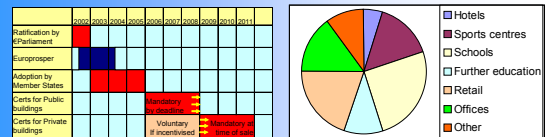
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When are certificates required??

- On construction, sale or rent of any building
- In all "public" buildings > 1,000 m² energy certificate must be displayed in prominent place
(Up to 100,000 buildings in UK alone, say 500,000 in EU, Or say 70% of these numbers if restricted to Public sector)

As well as a methodology for new buildings, we need a method suited to the early requirement to certify the operation of existing public buildings



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Assessing non-domestic buildings at different stages of their life-cycle

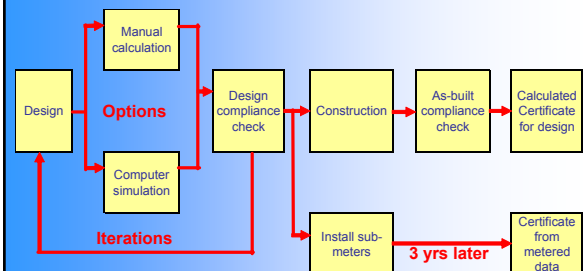
Building life-cycle stage	Energy history?	Method	Certificate status	Subject of grading
New	NO	Calculate using design data	Theoretical	Asset only
Refurb	NO	Calculate using design data	Theoretical	Asset only
Empty	MAYBE	?????	?????	Asset + Management
Occupied	YES	Use measured data from meters	Reality	Asset + Management

€P Focus

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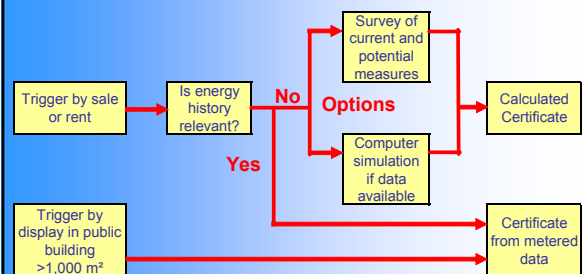
Process for new build / refurbishment



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Process for existing buildings



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State of Art Review

Country	Name of scheme	Type of scheme	Grading method
Experience with national certification schemes			
Denmark	ELO	Mandatory audit & certification for buildings > 1,500 m ²	By statistical distribution of peers
Finland	Energy Audit Programme (EAP)	Incentivised audits	N/A
US	Energy Star	Voluntary web scheme	By statistical distribution of peers
Australia	Australian Building Greenhouse Rating (ABGR)	Voluntary web scheme	Against benchmarks for a typical office building
Experience with national benchmarking schemes			
UK	ECONs 19 and 78 TM22	Voluntary 'official' rating; benchmarks for end users	Against benchmarks for a typical office building
Norway	Key Numbers	Voluntary 'official' rating by end use analysis	Against benchmarks for a typical office building

Comfort check

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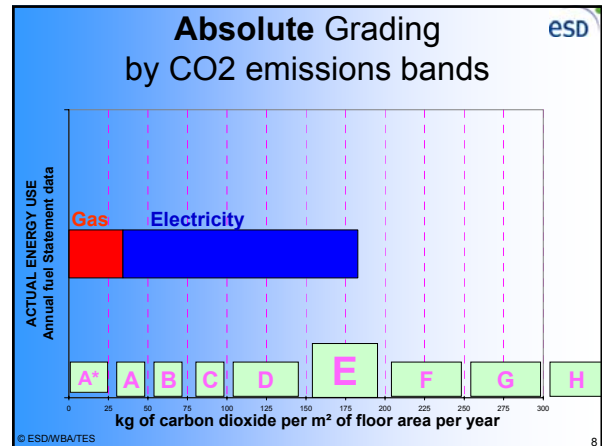
ESD

Presentation of building energy performance

- Article 3
"The energy performance of a building shall be expressed in a transparent manner and may include a CO₂ emission indicator"
- Article 7.2
Certificate must compare energy performance with reference values such as benchmarks
- Article 10
"Certification shall be carried out in an independent manner by qualified and/or accredited experts"

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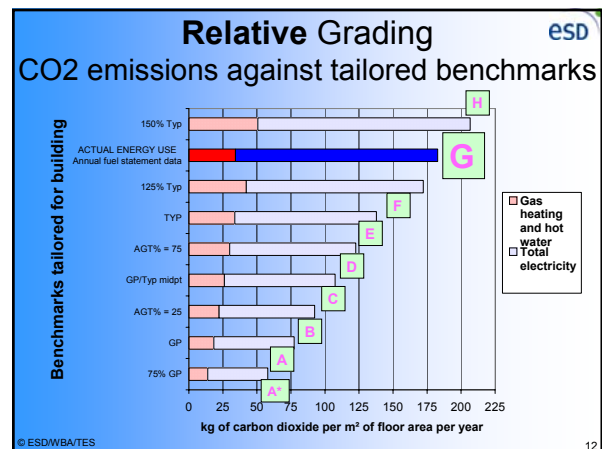
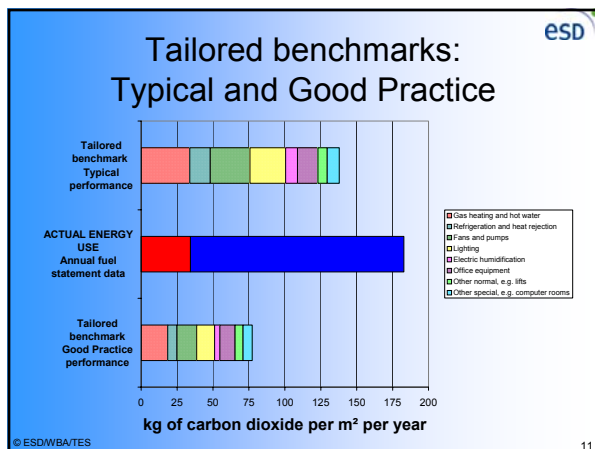
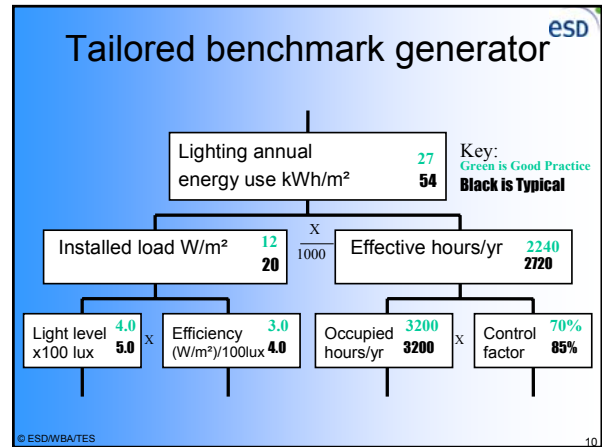


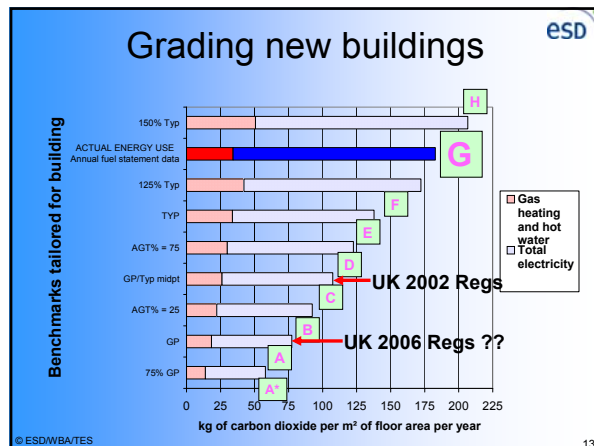
Schedule of accommodation
to generate a 'tailored' benchmark
for an office building

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	AREA % BY SERVICING			NUMBER WORK STATIONS	WEEKDAY USE:		WEEKEND USE:	
	Nat vent	Air Con	Mixed mode		Flexi time?	Late wkg?	Sat hrs	Sun hrs
Cellular offices	10		10	100	N	Y	0	0
Open plan offices		50		250	Y	N	8	8
Circ/support		30						
Totals	10	80	10	350				

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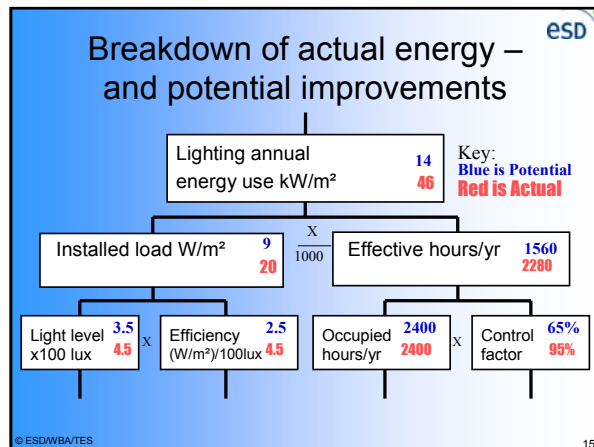
Energy saving Advice

ESD

Article 7.2

- Certificate must include advice on how to improve energy performance cost-effectively

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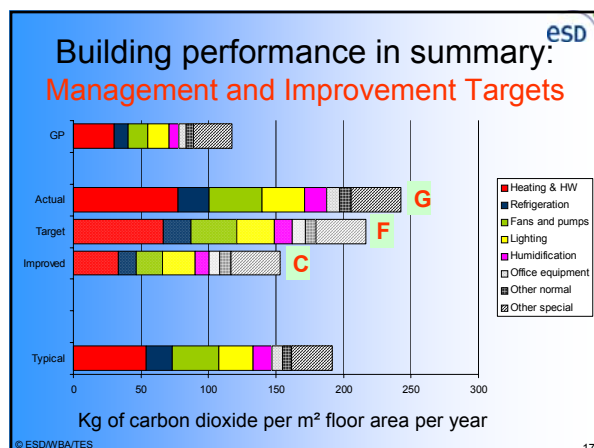


Examples of energy saving measures

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ENERGY MEASURES	ASSESSOR INPUT	
	Actual current	Improvement potential %
Replace prismatic light fittings with reflective	95%	100%
Relamp T12 with T8/T5	100%	100%
Install HF or low-loss gear	40%	100%
Remove or partial switch off lighting	20%	20%
Install presence controls	10%	80%
Install lux controls	15%	80%
Install time control	0%	0%
Replace Ext'l with high efficiency lamp/fittings	100%	100%
Install Ext'l time or lux control	100%	100%
Commission lighting controls	90%	100%
Security & cleaning procedures for lighting	0%	100%
Staff use of light switches	30%	70%

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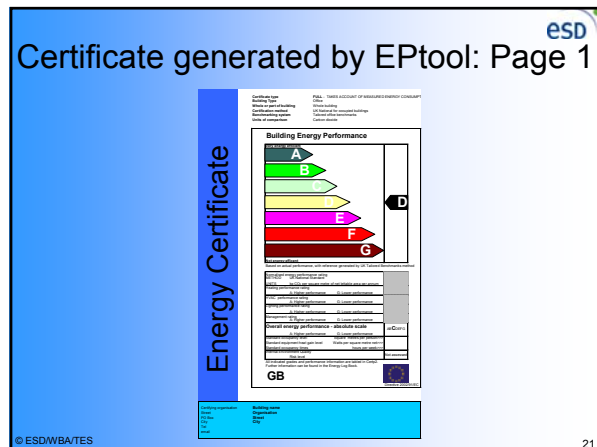
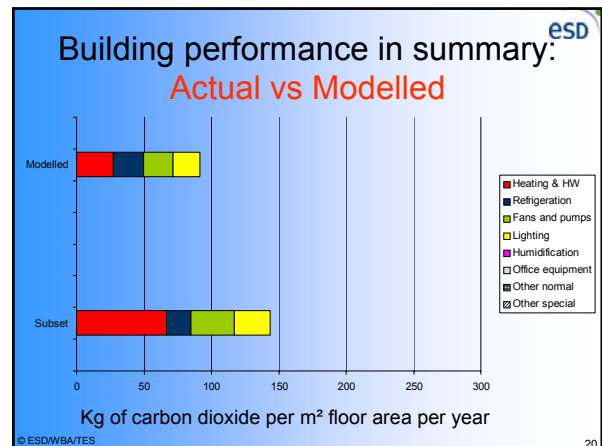
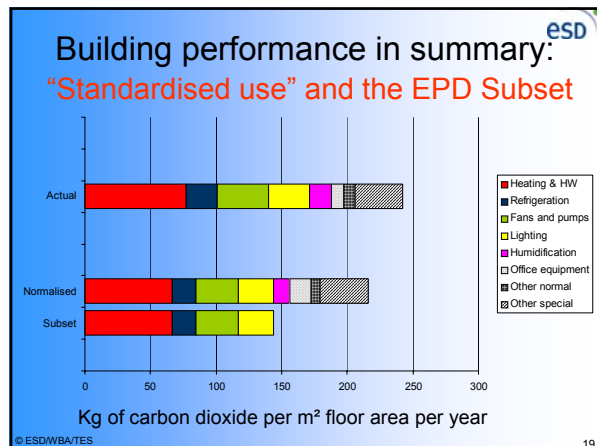


EPD's definition of energy performance of a building

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- Article 2:
 “the amount of energy actually consumed OR estimated to meet the different needs associated with a standardised use of the building, which may include inter alia heating, hot water heating, cooling, ventilation and lighting.”

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- ### Landlord/tenant splits
- For building with single/head tenant
 - Certify the building as a whole
 - For multi-tenanted buildings
 - Certify each tenancy
 - Use tenant (sub)meters where available and
 - Landlord's statement of annual energy
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- ### Where from here?
- Develop unifying strategic framework
 - CEN Standard for certification based on measured energy
 - Extension of methodology to other building sectors (Sports centres, Education, etc.)
 - Extension to other EU countries
 - Proposal to Intelligent Energy for Europe
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- ### SUMMARY
1. Pragmatic and quality assured approach
 2. Integrated accounting for energy saving measures
 3. Normalisation possible for "standardised use"
 4. Transparency between modelled results and actual energy consumption
 5. Implementation can be smoothed by co-ordination with Regulations and existing information sources
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