Guidelines on the implementation of EED Articles 9-11 for thermal energy - application of economic efficiency and technical feasibility conditions

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Introduction

- Contract, guidelines development
- Regulatory response to Art. 9-11 EED
- Viable, exempted and open building classes
- Principle: ⇧ impact ⇩ burden
- Criteria for building class exemption

Building assessment – for any building in Europe

- Positive result (costs ≤ benefits) means *technically feasible and cost-efficient*
- Benefits estimated from best evidence
- Inflated cost assumptions avoided
- Data requirement minimised

Application and calculation support

Contract ENER/C3/2013-977

"**Analysis of good practices and** development of **guidelines for** accurate and fair **allocation of costs** for individual consumption of heating, cooling and domestic hot water in multi-apartment and multi-purpose buildings **to support the implementation of** relevant provisions of the **Articles 9-11** of the Directive 2012/27/EU on energy efficiency"

Brief for analysis and guidelines:

"to clarify where individual heat/cool/hot water meters or heat cost allocators **do not have to be provided**", focussing on **criteria for technical feasibility and cost-effectiveness**

Contract - Scope: Articles 9 - 11

- EED Article 9 (3) – except first paragraph
- EED Article 10 (1)
- EED Article 11
- EED Annex VII

Development stages

- Jan - Jun 2015 Expert consultation + workshop, Berlin
- Jul - Sep 2015 Drafting, calculation proof of concept
- Oct 2015 Validation workshop, Brussels
- Nov - Dec 2015 Stakeholder consultation
- Feb 2016 – EED Committee presentation / MS consultation
- Feb 2016 - Stakeholder workshop, Brussels
- Apr 2016 – Workshop Nordic countries, Stockholm
- Sep 2016 - Workshop Mediterranean countries, Madrid
- Oct 2016 - Workshop Northwestern countries, Amsterdam
- Nov 2016 - Workshop Central European countries, Berlin
- Nov 2016 - Workshop Eastern European countries, Warsaw

Art 9 (3) … In multi-apartment and multi-purpose buildings with …/cooling source or supplied from … network or from a central source … buildings, individual consumption meters shall also be installed by 31 December 2016 to measure the consumption of heat or cooling or hot water fo… …here technically feasible and cost-efficie… …e use of individual meters is [unless] not t… …sible or not cost-efficient, to measure heating, individual heat cost … shall be used for measuring heat …tion at each radiator, unless it is shown by the …State in question that the installation o… heat cost allocators would not be cost-efficient. … cases, alternative cost-efficient methods of heat consumption measurement may be considered.

BUILDING CLASS
(description allowing buildings to be identified)

ENERGY USE
(type of use of thermal energy)

MEASURE
(action to be taken)

CONDITIONS
9(3) is conditional but can be transposed unconditionally

Viable building class : you have to **do it**

For a described type of building (or all) the MS **obliges** building energy providers to install meters for space heating **unconditionally**. "where technically feasible and cost-efficient“ is removed from EED text.

Open building class: you have to **do it if it is worth it**

For a described type of building (or all) the MS **obliges** building energy providers to install meters for space heating **conditionally**. The assessment of the condition "where technically feasible and cost-efficient“ is the responsibility of each energy provider for each building.

Exempted building class: you **don’t** have to **do it**

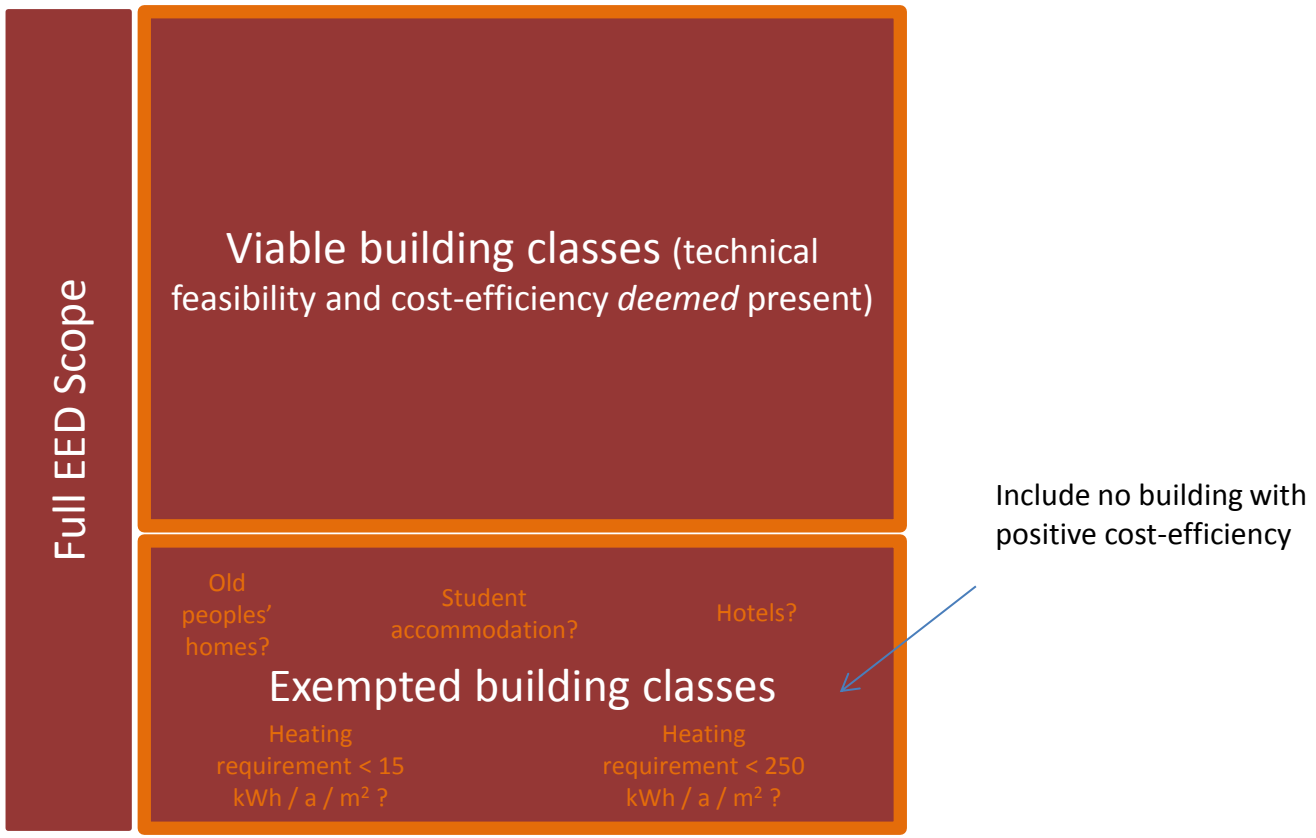
For a described type of building (or all) the MS **exempts** building energy providers **unconditionally** from installing meters for space heating (used with viable or open building classes) or **no regulation** is enacted, on the grounds that the measure is not building class

Introduction | observed regulatory practice

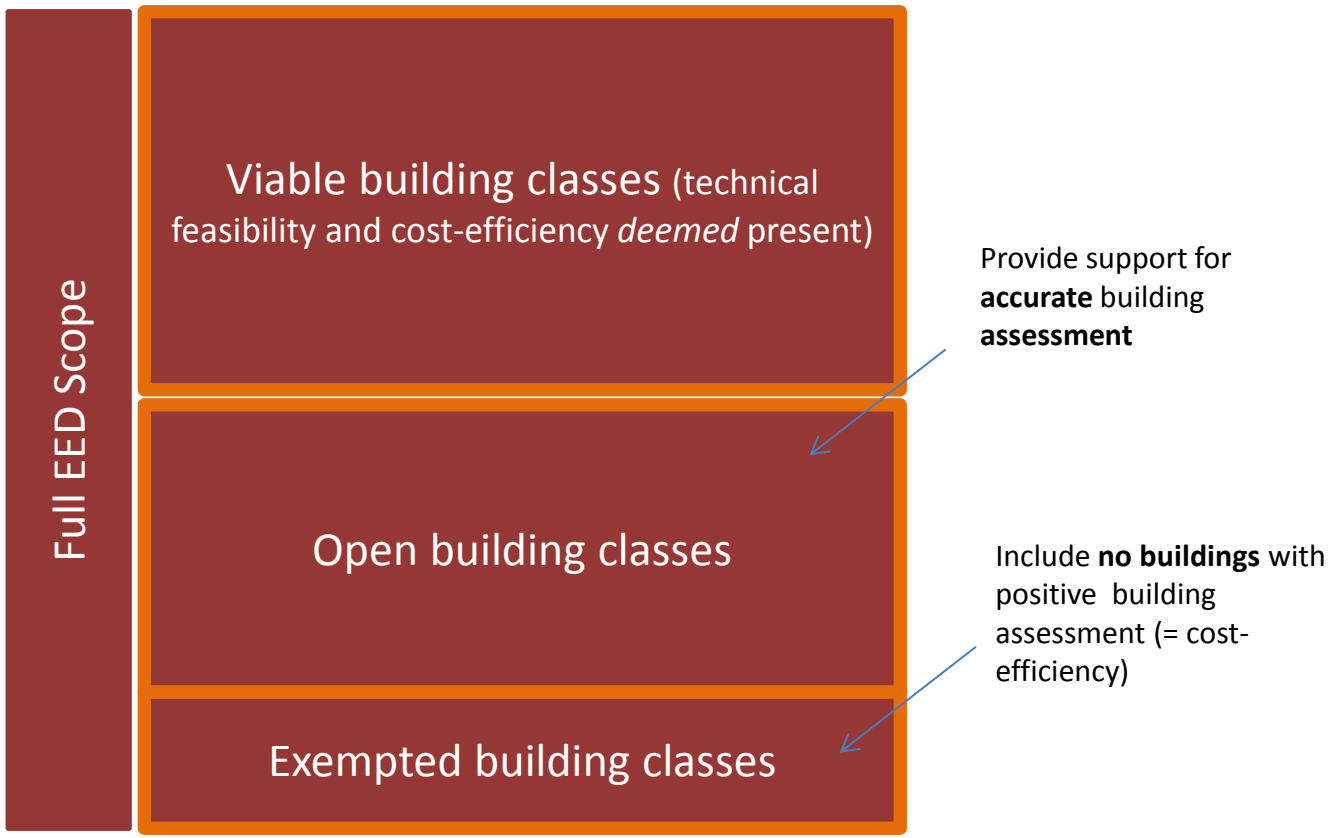
Usage	Viable Building Classes	Exempted Classes (explicit)	Exempted Classes (implicit)	Open Building Classes
space heating	7 - 9	7	5	15
space cooling	4	0 - 1	9 - 10	11
hot tap water	6	5	6	14

- Germany:
  - large viable building class
  - some exempted building classes (e.g. low energy buildings - < 15kWh/m^{2}a)
- Spain:
  - building classes defined by climate zones
  - 2 hottest zones exempt, all other zones viable
- UK:
  - open building classes (test each building)
  - landlords given support with a calculation tool

Introduction | observed regulatory practice



Introduction | observed regulatory practice



Building assessment

- is positive where "technically feasible and cost-efficient“
- treats “technical feasibility” as modifications of costs or benefits
- is positive where costs ≤ benefits

Building assessment is used by

- MS national authorities on test cases for defining Exempted Building Classes
- Landlords (obligated actors) in an Open Building Class on their building

Where do benefits come from?

Benefits come from **energy savings** from **behavioural change**

Art 9 (3) EED : ”Individual consumption meters shall be installed ... [unless] not technically feasible or not cost-efficient

But benefits are ZERO unless consumption data is used to trigger behavioural change

Behavioural change results from ensuring

that “billing information is ... based on actual consumption ... where this is technically possible and economically justified” EED 10(1)

= consumption-based cost allocation

and that where appropriate, information is made available to final customers in clear and understandable terms [at least on] comparisons of ... current energy consumption with consumption for the same period in the previous year“ **(**EED Annex VII)

= consumption information services

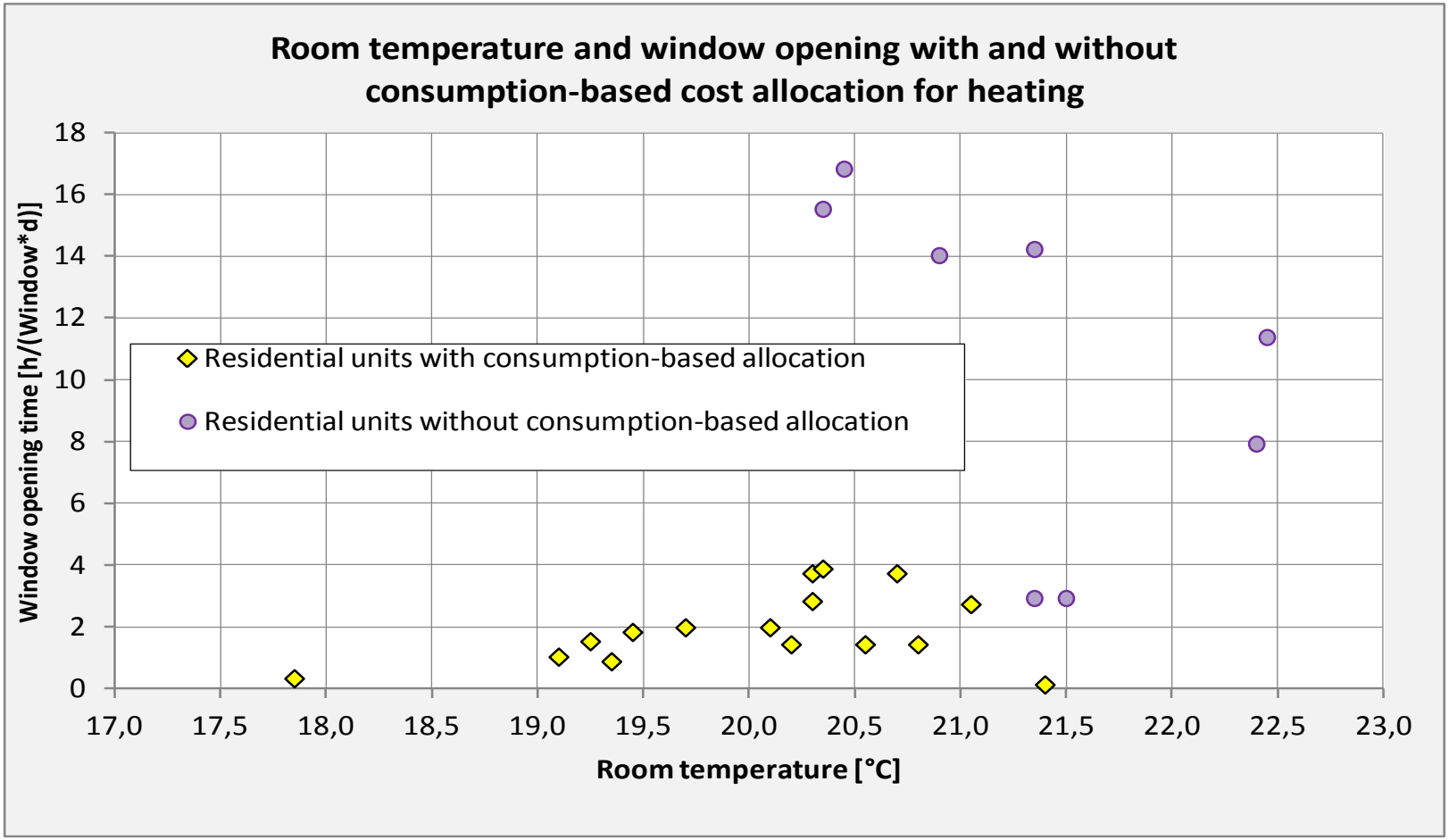
What energy savings can we expect in what buildings?

Studies have long reported 20% - 30% energy saving from **consumption-based cost allocation** in moderate climates in older buildings

Percentages are not stable: as buildings improve and the climate warms (!), the amount of energy saved falls but the percentage of energy saved rises.

Underlying **behavioural change** is the same:

- more careful temperature settings
- more careful use of ventilation
- more careful use of hot water



Source: IWU 2003

Evidence of energy saving from studies

+

Knowledge of

- buildings in the studies (wall insulation, air leakage, boiler efficiency, user control etc.) and

- **climate** during the studies (degree days, sunshine hours)

=> (physics) =>

Evidence of **behavioural change**

(more careful temperature setting and ventilation behaviour; average values)

- Evidence of 20% energy saving from **consumption-based cost allocation** in cool climates in older buildings translates to
  - 2.2 K average reduction in building temperature OR
  - 0.5 ACH average reduction in ventilation rate through reduced window opening OR
  - a proportion of each.
- Studies suggest proportions are not extreme. **Guideline values**:
  - **1.1 K** average reduction in building temperature AND
  - **0.25 ACH** average reduction in ventilation rate

Evidence of percentage energy savings from studies

+

Knowledge of buildings in studies and their climate

=>

Evidence of average behavioural response

+

Knowledge of a specific building and its climate

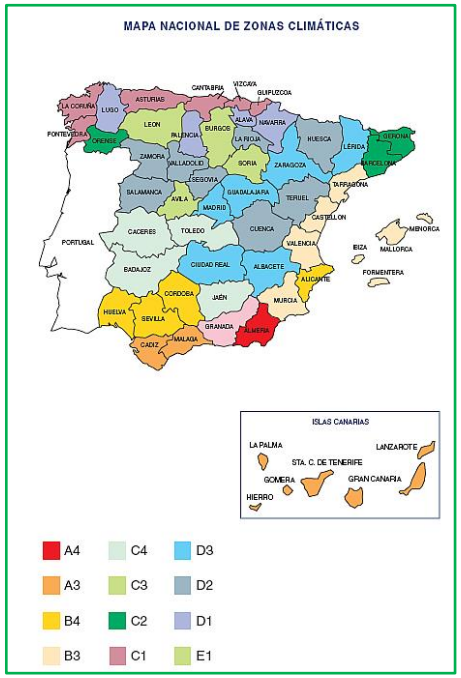
=>

Expected benefits in a specific building

Building assessment – for any building in Europe

- Expected benefits:
  - Evidence base translated into typical behavioural change
  - Knowledge of the building (U value, fuel type etc.) and its local climate and
  - Local fuel prices
- Expected costs:
  - for a building class (country): apply *reference costs* from guidelines or from monitoring competitive costs
  - for specific buildings: use prices from competitive local suppliers (*competitive costs*)

Building Assessment | Application



datos climáticos genéricos from CTE

1.- IDENTIFICACIÓN DEL EDIFICIO O DE LA PARTE QUE SE CERTIFICA:

Nombre del edificio			
Dirección	Calle Pelayo		
Municipio	San Vicente del Ras	**Código postal**	03690
Provincia	Alicante	**Comunidad Autónoma**	Comunidad Valenciana
Zona climática	B4	**Año construcción**	1963
Normativa vigente (construcción/rehabilitación)			
Referencia/s catastral/es			

1. SUPERFICIE, IMAGEN Y SITUACIÓN

Superficie habitable (m^2)	640,35

2. ENVOLVENTE TÉRMICA

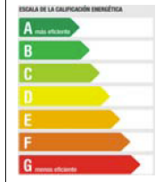
Cerramientos opacos

Nombre	Tipo	Superficie (m^2)	Transmitancia (W/m^2K)	Modo de obtención
		145,00	5,0000	Estimación

Huecos y lucernarios

Nombre	Tipo	Superficie (m^2)	Transmitancia (W/m^2K)	Factor solar	Modo de obtención Transmitancia	Modo de obtención Factor solar
		45,00	8,0000	1,0000	Estimación	Estimación

DEMANDA DE CALEFACCIÓN



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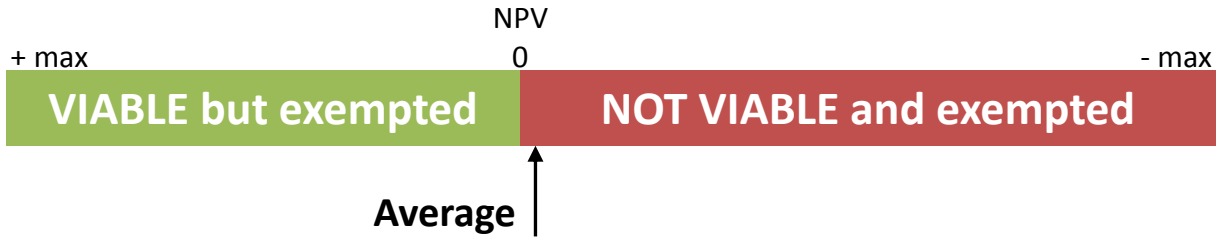
Demanda global de calefacción (kWh/m^2año)

85

DEPRECATED : Exempted building class justified by the **average building failing building assessment**



RECOMMENDED : Exempted building class justified by a **test case failing building assessment**

The **test case** should be one in which viability is most likely:

a large and poorly insulated building
... in a difficult climate zone (cold for heating, hot for cooling)
... with an inefficient heating system using expensive fuel

Building Assessment | Application

			
Location	Central Alps, AT	Nord, FR	Alicante, ES
Storeys / apartments	6 / 16	5 / 18	4 / 16
Temperatures	Low	Medium	High
Heating days	260	208	34
Built in	1986	1885	1963
Insulation quality	Medium	Poor	Very poor
Viable?	Yes	Yes	No

Guidelines for the application of economic efficiency and technical feasibility conditions in Articles 9-11 EED

Thank you !

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