



CONCERTED ACTION
ENERGY EFFICIENCY
DIRECTIVE

Energy efficiency in historical buildings, places of worship and buildings owned by the armed forces - Article 5(2)

Executive Summary 2.4

Public Sector - public buildings and public purchasing

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1 Summary

1.1 Background and motivation

The Energy Efficiency Directive (EED) states explicitly that the public sector at the national, regional and local level should fulfil an exemplary role as regards energy efficiency (EE). Article 5 of the EED – “Exemplary role of public bodies’ buildings” - permits two approaches, the “default” (art.5(1)) and the “alternative” (art. 5(6)).

This report focuses on art. 5(2) where it states that Member States (MS) may decide not to set or apply the requirements referred to in art. 5(1) to the following categories of buildings:

- (a) buildings officially protected as part of a designated environment, or because of their special architectural or historical merit, in so far as compliance with certain minimum energy performance requirements would unacceptably alter their character or appearance;
- (b) buildings owned by the armed forces or central government and serving national defence purposes, apart from single living quarters or office buildings for the armed forces and other staff employed by national defence authorities;
- (c) buildings used as places of worship and for religious activities.

However, such categories frequently offer high energy saving potential and are located in all MS. As such they represent an important area to address.

This report investigates the detail of this article. The objectives of the research were as follows:

- Knowledge of energy consumption data across the three exempted categories.
- Level of importance attributed to these categories of buildings in the MS.
- The “default” or the “alternative” approach in relation to the exemptions issue.
- Pros and cons of the exemptions from MS experiences.

A questionnaire was sent to the 29 participating countries and 27 were returned. One MS answered too late to be covered by the statistics provided in this report, although its comments have been included. The main findings from the questionnaire are summarised below.

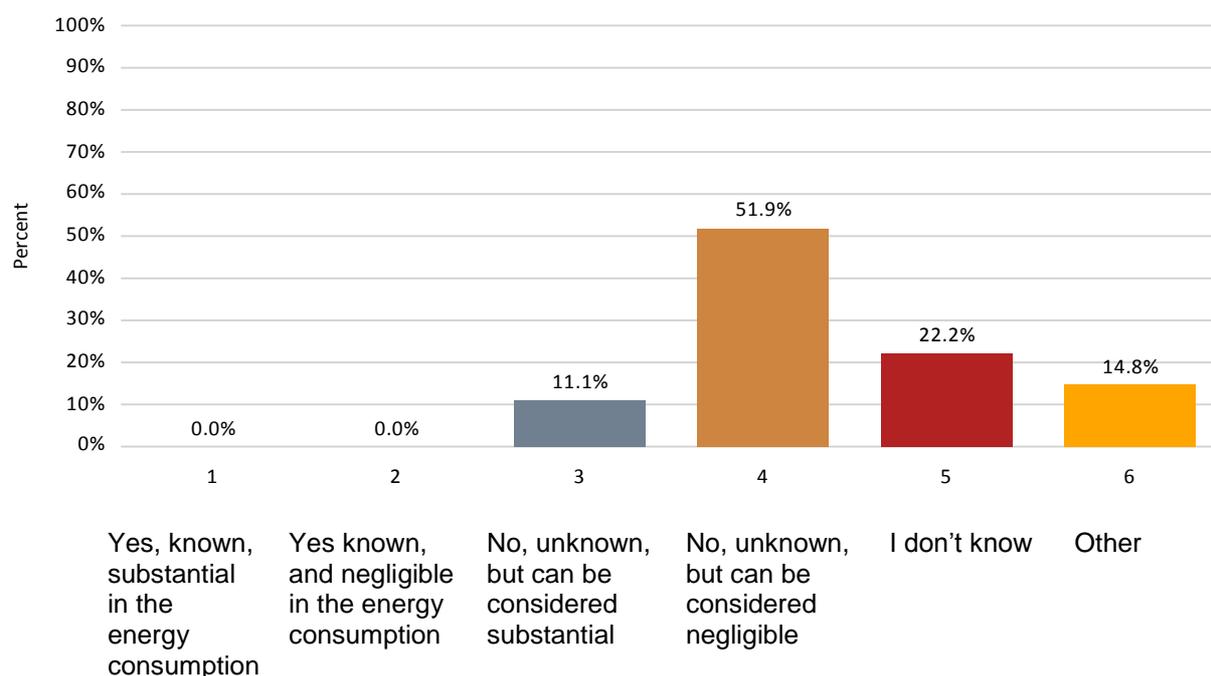
1.2 Most important findings

The implementation of Article 5 in historical buildings, the defence sector and places of worship (“the three areas”) is affected by many complex issues:

1. **Availability of data on energy consumption.** This is a general issue for the three areas, but especially in the historical sector, because:
 - Data is scarce. For example, the availability of detailed energy consumption data for places of worship is rather low: 15 MS are not aware of this data and don’t consider them substantial. 7 MS don’t have any awareness of the issue. Only 4 MS attach importance to data, though the exact data is unknown (fig. 1).
 - Where data is available, they are not considered relevant for energy consumption.
 - Available data might not be homogeneous or comparable with each other since they refer to buildings with different final uses, either in the historical and defence sectors.
 - The actual final use of buildings (e.g. libraries, police stations, social recreational spaces, worship or social spaces) heavily affects the level of knowledge of the data.
 - Awareness that interventions to the building fabric might have a very limited impact on the reduction of energy consumption as these buildings (mostly the places of worship) are in general not heated or inhabited and so energy consumption is very low.
 - The level of awareness of and responsibility for data is often shared among different authorities/owners.

- The level of protection of the buildings in terms of either security or in respect of the original structures means further constraints.

Figure 1. Answers given to the question “Are the exact data on energy consumption in worship buildings in your country known?”



2. There is a general feeling in MS that EE is not a priority in these three areas

- There is a general feeling that EE is not a priority in these three areas for most MS (at least in 25 out of the 27 who responded the questionnaire), especially in historical buildings, and therefore it is not a driver when interventions in the buildings are being designed and implemented.
- The MS replies and comments to the questionnaire referred to all historical and places of worship, **not only those the responsibility of central governments.**

3. The main barriers in undertaking EE measures in the three areas, are highlighted below:

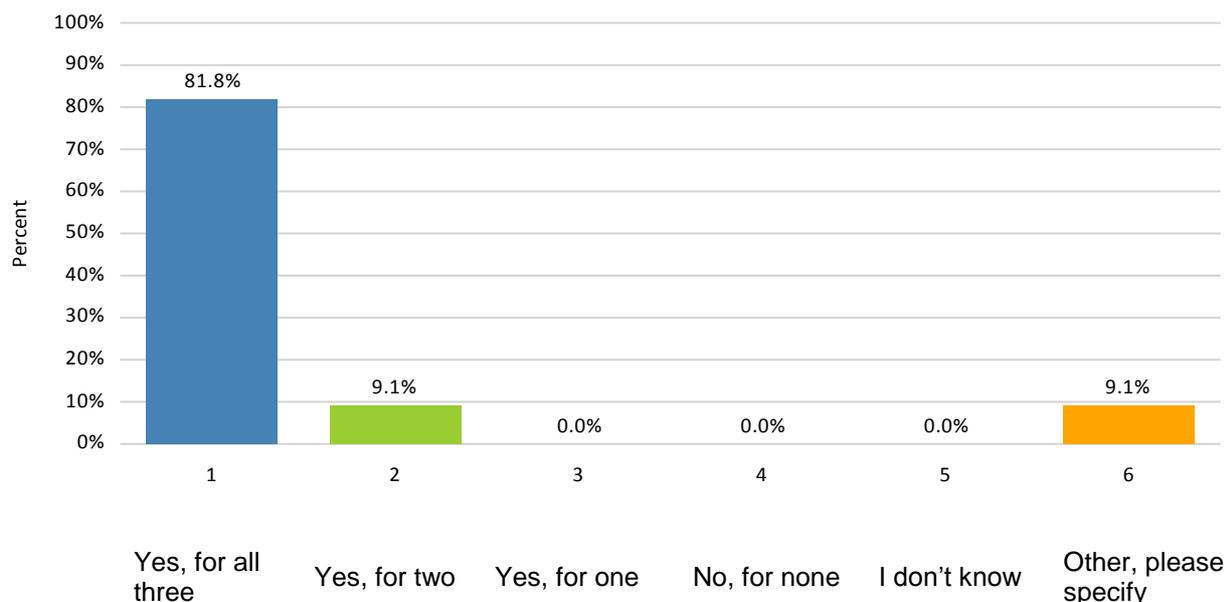
- The achievable energy savings in these buildings will have only a limited impact on overall energy consumption levels.
- The heating, cooling and lighting plants of these buildings must usually comply with energy requirements and standards set by national legislation.
- Fear of endangering the architectural or/and historical characteristics of the buildings.
- Lack of detailed data on energy consumption and difficulties, often due to budgetary constraints, in the development of a mechanism for the collection and monitoring of the necessary data.
- The upfront investment needed is not proportionate to the achievable economic benefits due to the specific architectural requirements for refurbishing such buildings. Investments are not cost-effective and their payback time is too long.
- Difficulties often arise in cooperation between different ministries with responsibilities for the buildings.
- Military security is not a negligible factor and can also hinder the design and implementation of EE improvements (EEI).

4. The MS that have chosen the “default” approach have provided the following comments:

- **Eleven MS** have chosen the default approach. **Ten of them asked for the exemptions** under art. 5(2) primarily for defence sector buildings, but also for both the historical and places of worship (fig. 2).
- The **main reasons for the exemption** requests are linked to Energy Performance of Buildings Directive (EPBD) obligations and existing national legislation, difficult cooperation with other responsible national organisations, problems with data availability and collection, and the lack of balance between the needed investment and the related achievable economic benefits.

For the other MS, further decisions depend on the economic feasibility of the refurbishment requirements.

Figure 2. Answers given to the question “Since your country has chosen the “default” approach, has your country applied for any of the three exemptions possible under art. 5(2)?”



5. The MS that have chosen the “alternative” approach provided the following comments:

Six MS of the 16 that have **chosen the alternative approach**, have undertaken or are planning **measures** to implement art. 5 in the three areas. When there is no target specifically for these types of buildings, an overall target is set for all.

6. An overview of **interventions under both approaches** shows that:

- The **defence sector** has highest rate of implementation, with 13 MS in the process of undertaking EEI.
- **Historical buildings** followed in second place with 10 MS undertaking EEI.
- Only 3 MS comply with EE performance requirements for places of worship. In some cases, such buildings can access grants eligible to any other building for EEI. The decision whether to undertake EEI is left to the building operator and is not based on a top-down approach.
- It would be good practice to extend **successful schemes already in place in these three areas**, e.g. P.L.A.G.E. (Bulgaria), GIS (Poland), Eco.AP (Portugal) and GGC (United Kingdom).

7. The **National Energy Efficiency Action Plans (NEEAPs)** in some countries have already envisaged EEI in buildings in the three areas.

8. For the **measures focused approach set up** in Greece and Italy, the quantitative target for the savings, especially for the defence sector, is indicated in terms of **primary energy consumption** (in m² or kWh). In Greece, the quantitative target was established as part of a pilot project for the implementation of energy efficiency measures in museums: the upper value cannot be higher than 60kWh/m²/year. In Italy, the energy data are only known for the potential renovation area, and so this 14,000,000 m² serves as basis for the target calculation of 3%/year.

9. The **most recurring ways to finance** EEI in these areas are:

- EU structural funds and EU programmes, e.g. LIFE.
- National subsidies and allocations, encompassing ESCO involvement.
- Specific incentive measures.

No Public Private Partnership (PPP) was explicitly been mentioned by any MS.

1.3 Pros and cons from MS experiences

The exempted buildings are not excluded from EE measures - they are just not obliged to install them. Countries that have tried to renovate these types of buildings have found that:

- The anticipated barriers and uncertainties in improving EE were confirmed.
- The positive experiences could be judged **not only in terms of percentage of EE savings/improvements but also by the process of installing them.**

Under the latter criterion, **positive experiences** have been or will be realised in many MS, mainly because:

- There is an energy audit system in place for cultural and historical buildings.
- The EE measures recommended by the audits are not on the building fabric, nor do they change the historical exterior of the building.
- The most common measures are on the heating systems (boiler substitution, air-conditioning, etc.) and are part of general building renovation, rather than specific EEI programmes.
- National cultural programmes are in place.

The **negative experiences share three main barriers**:

- Lack of flexibility on the part of the involved authorities.
- Lack of the necessary funds and the poor cost-effectiveness of such measures.
- Problems in the coordination of different measures and resources (financial and personnel).

2 Recommendations

This report concludes that the **issue under consideration is quite sensitive and worth further studying**.

Despite the barriers and constraints identified, it was assumed that **the potential for EEI in buildings in the three areas is not insignificant**:

- A thorough assessment of the EE potential in buildings in these categories might be advisable.
- Similarly, the set-up of an energy management systems (EMS) based on the good experiences provided by a few MS could be a useful undertaking.
- A deeper knowledge of the actual energy consumption of the buildings belonging to the categories in question would raise the profile of this issue in MS governments.
- Priority should be given to EEI that can be tackled more easily, and with a better cost/benefit ratio (cost-effectiveness).
- All buildings, except the strategic ones, should comply with the national standards set up for EE.
- Funds could come from a combination of budgets from each ministry with responsibility for the building, and from the budget of the ministry responsible for energy, and allocated to public sector building renovation.
- Since energy data is generally lacking while setting saving targets, it could be appropriate to scale them in percentage of savings (e.g. 15%) rather than express them in m² or kWh.
- A pragmatic approach based on a balance between comfort, cost and protection of historical heritage could be pursued through ad hoc legislative measures that target both heritage and energy matters.

It was also suggested that the pros and cons of using financial facilities (such as those from European Investment Bank) could be further investigated

After this research the following comments were made:

- EE is not a driver in monumental buildings, but is essential in historical ones when we consider the buildings as subjects for energy consumption reduction, e.g. in Rome (Italy) the majority of historical buildings are the headquarters of public administration institutions like ministries, authorities and service offices.
- In the short to medium term, an integrated approach that considers requirements not only of the EED but also of the EPBD and the Renewable Energy Sources (RES) Directive is strongly advisable.
- A thorough assessment of a project is recommended. Deeper knowledge of actual energy consumption, for example, makes atypical ESCO projects less risky (e.g. in theatres).
- This goes in parallel with the recommendation to focus efforts on the different institutions involved which usually have different interests, approaches and visions for the buildings in question, e.g. in Italy, the Cultural Heritage Ministry, Energy Sector Ministry, and National Defence Ministry are the main stakeholders. Combining different budgets is highly advisable. Supporting financial schemes is an issue for further investigation.
- It is necessary to identify financing mechanisms for building renovations that meet both the needs of the public sector and of the financing entities, and to encourage the banks to adapt their strict financing rules to be more suitable for energy efficiency schemes.
- It was noted that buildings can be defence operated and as well historic; can be large, remote or mobile (e.g. in military situations), can have high energy demands (cooling/heating), or of bespoke design.
- The majority of MS do include military and historic buildings in their energy efficiency programmes: 10 countries have opted for exceptions. However, religious buildings or places of worship do not generally offer potential for energy efficiency (they are used infrequently and are not well heated) and so are therefore often outside the scope of energy efficiency programmes.

3 Practical examples

Some model projects include: (to be downloaded from www.ca-eed.eu):

- Irma Thijssen (Netherlands) - Energy efficiency in historical buildings and buildings owned by the armed force.
- Styliani Fanou (Italy) - Historic Building Protection and Energy Efficiency: the pilot case of Serravalle, historic centre of Vittorio Veneto, Italy.
- Tom Bennington (European Defence Agency) - Defence Buildings – Some Unique Challenges.
- Michael ten Donkelaar (Czech Republic) - Reconstruction of the National Theatre in Prague.
- Wanda Antoniazzi (Italy) – Il Caso Di Serravalle.
- Styliani Fanou (Italy) - Applicability and feasibility to implement new funding mechanisms: CERTUS Project.

Other examples of projects can also be found as follows:

[1] United Kingdom examples available at:

- <http://webarchive.nationalarchives.gov.uk/20130109092117/http://decc.gov.uk/assets/decc/11/tackling-climate-change/saving-energy-co2/6922-a-guide-to-financing-energy-efficiency-in-the-publ.pdf>
- www.quaker.org.uk/sustainability-grants
- www.churchandcommunityfund.org.uk
- www.nationalchurcheistrust.org

[2] Examples of EEI interventions in the Netherlands:

Structural programme for energy saving for 850 buildings owned by the armed forces and for 350 national historical buildings (part of the alternative approach, 2% energy saving per year), including:

- Rijksmuseum.
- Van Gogh Museum (BREEAM very good certificate).
- Menu Green Lease (<http://www.platformduurzamehuisvesting.nl/english/>).

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For further information please visit www.ca-eed.eu or contact the CA EED Coordinator Lucinda Maclagan at lucinda.maclagan@rvo.nl



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