

**ENVIRONMENTAL PROTECTION (ENERGY END-USE  
EFFICIENCY) ACT 2009**

**Principal Act**

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**Transposing:**  
Directive 93/76/EEC

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AN ACT TO TRANSPOSE INTO THE LAW OF GIBRALTAR DIRECTIVE 2006/32/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL OF 5 APRIL 2006 ON ENERGY END-USE EFFICIENCY AND ENERGY SERVICES AND REPEALING COUNCIL DIRECTIVE 93/76/EEC AS AMENDED.

**PART I  
PRELIMINARY AND INTERPRETATION**

**Title and commencement.**

1. This Act may be cited as the Environmental Protection (Energy End-Use Efficiency) Act 2009 and comes into operation on such day as the Minister may provide by notice in the Gazette.

**Scope.**

2.(1) The purpose of this Act is to enhance the cost-effective improvement of energy end-use efficiency in Gibraltar by—

- (a) making provision for the necessary indicative targets as well as mechanisms, incentives and institutional, financial and legal frameworks to remove existing market barriers and imperfections that impede the efficient end-use of energy; and
- (b) creating the conditions for the development and promotion of a market for energy services and for the delivery of other energy efficiency improvement measures to final consumers.

(2) This Act applies to—

- (a) providers of energy efficiency improvement measures, energy distributors, distribution system operators and retail energy sales companies. However, the Minister may, by regulations, exclude small distributors, small distribution system operators and small retail energy sales companies from the application of sections 6 and 13;
- (b) final customers, save for undertakings involved in categories of activities listed in Schedule 1 to the Greenhouse Gas Emissions Trading Scheme Rules 2004;
- (c) the armed forces, but only to the extent that its application does not cause any conflict with the nature and primary aim of the

activities of the armed forces and with the exception of material used exclusively for military purposes.

### Interpretation.

3.(1) In this Act, and unless the context otherwise requires—

“biomass” means the biodegradable fraction of products, waste and residues from agriculture (including vegetal and animal substances), forestry and related industries, as well as the biodegradable fraction of industrial and municipal waste;

“competent authority” means the Minister or any person or persons appointed by the Minister under sections 4(4) and 5(2);

“Directive” means Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC as amended;

“distribution system operator” means a natural or legal person responsible for operating, ensuring the maintenance of and, if necessary, developing the distribution system of electricity or natural gas in a given area and, where applicable, its interconnections with other systems, and for ensuring the long term ability of the system to meet reasonable demands for the distribution of electricity or natural gas;

“energy” means all forms of commercially available energy, including electricity, natural gas (including liquefied natural gas), liquefied petroleum gas, any fuel for heating and cooling (including district heating and cooling), coal and lignite, peat, transport fuels (excluding aviation and maritime bunker fuels) and biomass;

“energy audit” means a systematic procedure to obtain adequate knowledge of the existing energy consumption profile of a building or group of buildings, of an industrial operation or installation or of a private or public service, identify and quantify cost-effective energy savings opportunities, and report the findings;

“energy distributor” means a natural or legal person responsible for transporting energy with a view to its delivery to final customers and to distribution stations that sell energy to final customers, excluding electricity and natural gas distribution system operators;

“energy efficiency” means a ratio between an output of performance service, goods or energy, and an input of energy;

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“energy efficiency improvement” means an increase in energy end-use efficiency as a result of technological, behavioural or economic changes;

“energy efficiency improvement measures” means all actions that normally lead to verifiable and measurable or estimable energy efficiency improvement;

“energy efficiency improvement programmes” means activities that focus on groups of final customers and that normally lead to verifiable and measurable or estimable energy efficiency improvement;

“energy efficiency mechanisms” means general instruments used by the Minister pursuant to this Act to create a supportive framework or incentives for market actors to provide and purchase energy services and other energy efficiency improvement measures;

“energy performance contracting” means a contractual arrangement between the beneficiary and the provider (normally an ESCO) of an energy efficiency improvement measure, where investments in that measure are paid for in relation to a contractually agreed level of energy efficiency improvement;

“energy savings” means an amount of saved energy determined by measuring or estimating consumption before and after implementation of one or more energy efficiency improvement measures, whilst ensuring normalisation for external conditions that affect energy consumption;

“energy service” means the physical benefit, utility or good derived from a combination of energy with energy efficient technology or with action, which may include the operations, maintenance and control necessary to deliver the service, which is delivered on the basis of a contract and in normal circumstances has proven to lead to verifiable and measurable or estimable energy efficiency improvement or primary energy savings;

“energy service company” and “ESCO” mean a natural or legal person that—

- (a) delivers energy services or other energy efficiency improvement measures in a user’s facility or premises, and accepts some degree of financial risk in so doing; and
- (b) the payment for the services delivered is based (either wholly or in part) on the achievement of energy efficiency

improvements and on the meeting of the other agreed performance criteria;

“final customer” means a natural or legal person that purchases energy for his own end use;

“financial instruments for energy savings” means all financial instruments such as funds, subsidies, tax rebates, loans, third-party financing, energy performance contracting, guarantee of energy savings contracts, energy outsourcing and other related contracts that are made available to the market place by public or private bodies in order to cover partly or totally the initial project cost for implementing energy efficiency improvement measures;

“Minister” means the Minister responsible for the environment;

“retail energy sales company” means a natural or legal person that sells energy to final customers;

“small distributor”, “small distribution system operator” and “small retail energy sales company” mean a natural or legal person that distributes or sells energy to final customers, and that distributes or sells less than the equivalent of 75 GWh energy per year or employs fewer than 10 persons or whose annual turnover or annual balance sheet total does not exceed the sterling equivalent of EUR 2,000,000;

“third-party financing” means a contractual arrangement involving a third party, in addition to the energy supplier and the beneficiary of the energy efficiency improvement measure, that provides the capital for that measure and charges the beneficiary a fee equivalent to a part of the energy savings achieved as a result of the energy efficiency improvement measure. That third party may or may not be an ESCO;

“white certificates” mean certificates issued by independent certifying bodies confirming the energy savings claims of market actors as a consequence of energy efficiency improvement measures.

## PART II ENERGY SAVINGS TARGETS

### General target.

4.(1) The Minister shall—

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- (a) publish guidelines in order to aim to achieve an overall indicative energy savings target for Gibraltar of 9% for the year commencing 17 May 2016, to be reached by way of energy services and energy efficiency improvement measures;
- (b) take cost-effective, practicable and reasonable measures designed to contribute towards achieving that target; and
- (c) set and calculate the indicative energy savings target for Gibraltar in accordance with the provisions and methodology set out in Schedule 1,

and for purposes of comparison of energy savings and for conversion to a comparable unit the following provisions apply–

- (i) the conversion factors set out in Schedule 2, unless the use of other conversion factors can be justified;
- (ii) the examples of eligible energy efficiency improvement measures set out in Schedule 3;
- (iii) the general framework for the measurement and verification of energy savings set out in Schedule 4.

(2) The energy savings in relation to the indicative energy savings target for Gibraltar referred to in subsection (1) shall be measured as from the date of coming into operation of this Act.

(3) For the purpose of the first Energy Efficiency Action Plan (hereinafter “EEAP”) to be submitted in accordance with section 14, the Minister shall, by regulations, make provision for–

- (a) an intermediate indicative energy savings target for Gibraltar for the year commencing 17 May 2010 which shall be realistic and consistent with the overall indicative energy savings target for Gibraltar referred to in subsection (1);
- (b) an overview of its strategy for the achievement of the intermediate and overall targets; and
- (c) programmes and measures to improve energy efficiency.

(4) The Minister may assign to such person or persons as he sees fit the overall control and responsibility–

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- (a) of overseeing the framework set up in relation to the target mentioned in subsection (1); and
- (b) of verifying the energy savings as a result of energy services and other energy efficiency improvement measures, including existing energy efficiency improvement measures for Gibraltar;
- (c) of reporting of results of such verification to the Minister.

#### **Energy end-use efficiency in the public sector.**

5.(1) The Minister shall—

- (a) ensure that the public sector fulfils an exemplary role in the context of the application of this Act, which role shall be communicated effectively to citizens or companies, as appropriate;
- (b) ensure that energy efficiency improvement measures are taken by the public sector, focussing on cost-effective measures which generate the largest energy savings in the shortest span of time, consisting of legislative initiatives or voluntary agreements, as referred to in section 6 or other schemes with an equivalent effect;
- (c) ensure that for the purposes of paragraph (b), at least two measures shall be used from the list set out in Schedule 6;
- (d) publish guidelines on energy efficiency and energy savings as a possible assessment criterion in competitive tendering for public contracts;
- (e) take steps to facilitate and enable the exchange of best practices between public sector bodies, for example on energy-efficient public procurement practices; to this end, the organisation referred to in subsection (2) shall cooperate with the European Commission with regard to the exchange of best practice as referred to in section 7.

(2) The Minister may assign to such person as he sees fit the administrative, management and implementing responsibility for the integration of energy efficiency improvement requirements as set out in subsection (1).

### **PART III**



**PROMOTION OF ENERGY END-USE EFFICIENCY AND ENERGY SERVICES**

**Energy distributors, distribution system operators and retail energy sales companies.**

6.(1) Energy distributors, distribution system operators and retail energy sales companies shall—

- (a) submit to the competent authority on request, but not more than once a year, aggregated statistical information on their final customers which the competent authority shall transmit to the Minister, and such information shall be sufficient for the Minister—
  - (i) to instruct the competent authority to properly design and implement energy efficiency improvement programmes;
  - (ii) to promote and monitor energy services and other energy efficiency improvement measures,

including historical information and current information on end-user consumption, including, where applicable, load profiles, customer segmentation and geographical location of customers, while preserving the integrity and confidentiality of information that is either of private character or commercially sensitive;

- (b) refrain from any activities that might impede the demand for and delivery of energy services and other energy efficiency improvement measures, or hinder the development of markets for energy services and other energy efficiency improvement measures,

and the competent authority shall take enforcement action in the Supreme Court as it deems appropriate to bring such activities to an end where they occur.

(2) The competent authority shall, acting on the instructions from the Minister—

- (a) ensure that energy distributors, distribution system operators or retail energy sales companies comply with one or more of the following requirements, directly or indirectly through other providers of energy services or energy efficiency improvement measures—

- (i) the offer to their final customers, and the promotion, of competitively priced energy services; or
  - (ii) the availability to their final customers, and the promotion, of competitively-priced energy audits conducted in an independent manner or energy efficiency improvement measures, in accordance with sections 9 and 12; or
  - (iii) the contribution to the funds and funding mechanisms referred to in section 11 at a level corresponding, as a minimum, to the estimated costs of offering any of the activities referred to in this section and agreed with the competent authority; or
- (b) ensure that voluntary agreements or other market-oriented schemes, such as white certificates, with an effect equivalent to one or more of the requirements referred to in paragraph (a), exist or are set up.
- (3) Voluntary agreements referred in subsection (2)(b)–
- (a) shall be assessed, supervised and followed up by the competent authority in order to ensure that they have in practice an effect equivalent to one or more of the requirements referred to in subsection (2)(a);
  - (b) shall have clear and unambiguous objectives, and monitoring and reporting requirements linked to procedures that can lead to revised or additional measures when the objectives are not achieved or are not likely to be achieved;
  - (c) shall be made available to the public and published prior to application to the extent that the duty of confidentiality allows, and contain an invitation for stakeholders to comment.
- (4) The competent authority shall ensure that there are sufficient incentives, equal competition and level playing fields for market actors other than energy distributors, distribution system operators and retail energy sales companies, such as ESCOs, installers, energy advisors and energy consultants, to independently offer and implement the energy services, energy audits and energy efficiency improvement measures described in subsection 2(a)(i) and (ii).

**Availability of information.**

7.(1) The competent authority shall ensure that information on energy efficiency mechanisms and financial and legal frameworks published under section 4 with the aim of reaching the indicative energy savings target for Gibraltar is transparent and widely disseminated to the relevant market actors.

(2) The competent authority shall ensure that greater efforts are made to promote energy end-use efficiency.

(3) The Minister shall establish appropriate conditions and incentives for market operators to provide more information and advice to final customers on energy end-use efficiency.

**Availability of qualification, accreditation and certification schemes.**

8. In order to achieve a high level of technical competence, objectivity and reliability, the competent authority shall ensure, where the Minister deems it necessary, the availability of appropriate qualification, accreditation or certification schemes for providers of energy services, energy audits and energy efficiency improvement measures as referred to in section 6(2)(a)(i) and (ii).

**Financial instruments for energy savings.**

9.(1) Any statutory provision or rule of law, other than any provision of the Income Tax Act, that unnecessarily or disproportionately impedes or restricts the use of financial instruments for energy savings in the market for energy services or other energy efficiency improvement measures is of no effect to the extent that it conflicts with any provision of this Act.

(2) The competent authority shall make model contracts for those financial instruments available to existing and potential purchasers of energy services and other energy efficiency improvement measures in the public and private sectors.

**Energy efficient tariffs and other regulations for net-bound energy.**

10.(1) Any incentives, including those of a statutory or administrative nature, in transmission and distribution tariffs which, in the opinion of the Minister, unnecessarily increase the volume of distributed or transmitted energy shall be amended or repealed by the Minister by, or in accordance with, regulations made under this section.

(2) The competent authority may, on the instructions of the Minister, impose public service obligations relating to energy efficiency on undertakings operating in the electricity and gas sectors respectively.

(3) Notwithstanding subsections (1) and (2), the competent authority may, on the instructions of the Minister, permit components of schemes and tariff structures with a social aim, provided that any disruptive effects on the transmission and distribution system are kept to the minimum necessary and are not disproportionate to the social aim.

#### **Funds and funding mechanisms.**

11.(1) Without prejudice to European Community rules on state aid, the Minister may establish a special fund or funds under the provisions of the Public Finance (Control and Audit) Act to subsidise the delivery of energy efficiency improvement programmes and other energy efficiency improvement measures and to promote the development of a market for energy efficiency improvement measures, including the promotion of energy auditing, financial instruments for energy savings and, where appropriate, improved metering and informative billing. The funds shall also target end-use sectors with higher transaction costs and higher risks.

(2) If established, the funds may provide for grants, loans, financial guarantees or other types of financing that guarantee results.

(3) Funds referred to in this section shall be open to all providers of energy efficiency improvement measures, such as ESCOs, independent energy advisors, energy distributors, distribution system operators, retail energy sales companies and installers, and the Minister may decide to open the funds to all final customers.

(4) Tendering or equivalent methods which ensure complete transparency shall be carried out in full compliance with the provisions of the Public Finance (Control and Audit) Act.

(5) The Minister shall ensure that funds referred to in this section complement, and do not compete with, commercially-financed energy efficiency improvement measures.

#### **Energy Audits.**

12.(1) The competent authority shall ensure the availability of efficient, high-quality energy audit schemes designed to identify potential energy efficiency improvement measures and which are carried out in an independent manner, to all final consumers, including smaller domestic, commercial and small and medium-sized industrial customers.

(2) Market segments that have higher transaction costs and non-complex facilities may be reached by the competent authority by other measures such as questionnaires and computer programmes made available on the Internet or sent to customers by mail. The competent authority shall ensure the availability of energy audits for market segments where they are not sold commercially, taking section 11(1) into account.

(3) For these purposes, certification in accordance with the Building (Energy Performance) Rules 2008 shall be regarded by the competent authority as equivalent to an energy audit meeting the requirements set out in subsections (1) and (2) and as equivalent to an energy audit as referred to in Schedule 6(e).

(4) Audits resulting from schemes based on voluntary agreements between organisations of stakeholders and an appointed body, supervised and followed up by the competent authority in accordance with section 6(2)(b) shall likewise be considered as having fulfilled the requirements set out in subsections (1) and (2).

#### **Metering and informative billing of energy consumption.**

13.(1) In so far as it is technically possible, financially reasonable and proportionate in relation to the potential energy savings—

- (a) final customers for electricity, natural gas, district heating or cooling and domestic hot water shall be provided by energy distributors, distribution system operators and retail energy sales companies with competitively priced individual meters that accurately reflect the final customer's actual energy consumption and that provide information on actual time of use; and
- (b) when an existing meter is replaced, such competitively priced individual meters shall always be provided by energy distributors, distribution system operators and retail energy sales companies, unless this is technically impossible or not cost-effective in relation to the estimated potential savings in the long term, and when a new connection is made in a new building or a building undergoes major renovations (as set out in the Building (Energy Performance) Rules 2008) such competitively priced individual meters shall always be provided.

(2) Where appropriate, billing performed by energy distributors, distribution system operators and retail energy sales companies—

- (a) shall be based on actual energy consumption, and presented in clear and understandable terms;
- (b) shall include appropriate information to provide final customers with a comprehensive account of current energy costs; and
- (c) shall be on the basis of actual consumption and shall be performed frequently enough to enable customers to regulate their own energy consumption.

(3) Energy distributors, distribution system operators and retail energy sales companies shall, where appropriate, make available the following information to final customers in clear and understandable terms in or with their bills, contracts, transactions, or receipts at distribution stations—

- (a) current actual prices and actual consumption of energy;
- (b) comparisons of the final customer's current energy consumption with consumption for the same period in the previous year, preferably in graphic form;
- (c) wherever possible and useful, comparisons with an average normalised or benchmarked user of energy in the same user category;
- (d) contact information for consumers' organisations, energy agencies or similar bodies, including website addresses, from which information may be obtained on available energy efficiency improvement measures, comparative end-user profiles and/or objective technical specifications for energy-using equipment.

#### PART IV FINAL PROVISIONS

##### **Reports.**

14.(1) The Minister shall transmit to the Commission the following EEAPs—

- (a) a first EEAP not later than the date of coming into force of this Act;
- (b) a second EEAP not later than 30 June 2011;

- (c) a third EEAP not later than 30 June 2014,

describing the energy efficiency improvement measures planned to reach the targets set out in section 4, as well as complying with the provisions on the exemplary role of the public sector and the provision of information and advice to final customers set out in sections 5 and 7 respectively.

- (2) The second and third EEAP's referred to in subsection (1) shall—

- (a) include a thorough analysis and evaluation of the preceding EEAP;
- (b) include the final results with regard to the fulfilment of the energy savings targets set out in section 4(1) and (2);
- (c) include plans for, and information on the anticipated effects of, additional measures which address any existing or expected shortfall vis-à-vis the target;
- (d) in accordance with section 15, use and gradually increase the use of harmonised efficiency indicators and benchmarks, both for the evaluation of past measures and estimated effects of planned future measures;
- (e) be based on available data, supplemented with estimates.

### **Regulations.**

15.(1) The Minister may make regulations giving effect to, or enabling the enforcement of any obligation incumbent on the Minister or on the competent authority in accordance with the provisions of this Act.

(2) Regulations made under this section may make provision for offences and civil and criminal penalties.

### **Offences.**

16. Any act or omission by any energy distributors, distribution system operators and retail energy sales companies—

- (a) contrary to any instruction given to it by the Minister or the competent authority pursuant to the provisions of this Act; or
- (b) contrary to any provision of this Act,

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is an offence punishable on summary conviction to a fine not exceeding level 4 on the standard scale.

**Schedules.**

17. The Schedules shall have effect.



## SCHEDULE 1

## Section 17

**METHODOLOGY FOR CALCULATING THE INDICATIVE ENERGY SAVINGS TARGET FOR GIBRALTAR**

The methodology used for calculating the indicative energy savings target for Gibraltar set out in section 4 shall be the following—

1. The competent authority shall use the annual final inland energy consumption of all energy users within the scope of this Act for the most recent five-year period previous to the coming into force of this Act for which official data are available, to calculate an annual average amount of consumption.

This final energy consumption shall be the amount of energy distributed or sold to final customers during the five-year period, not adjusted for degree days, structural changes or production changes.

On the basis of this annual average amount of consumption, the indicative energy savings target for Gibraltar shall be calculated once and the resulting absolute amount of energy to be saved applied for the time this Act remains in force.

The indicative energy savings target for Gibraltar shall—

- (a) consist of 9% of the annual average amount of consumption referred to above;
- (b) be measured after the 17th May 2016;
- (c) be the result of cumulative annual energy savings achieved throughout the nine-year operation period of this Act;
- (d) be reached by way of energy services and other energy efficiency improvement measures.

This methodology for measuring energy savings ensures that the total energy savings prescribed by this Act are a fixed amount, and thus independent of future GDP growth and of any future increase in energy consumption.

2. The indicative energy savings target for Gibraltar shall be expressed in absolute terms in GWh, or equivalent, calculated in accordance with Schedule 2.

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3. Energy savings in a particular year following the entry into force of this Act that result from energy efficiency improvement measures initiated in a previous year not earlier than 1995 and that have a lasting effect may be taken into account in the calculation of the annual energy savings.

In certain cases, where circumstances can justify it, measures initiated before 1995 but not earlier than 1991 may be taken into account.

Measures of a technological nature should either have been updated to take account of technological progress, or be assessed in relation to the benchmark for such measures.

In all cases, the resulting energy savings must still be verifiable and measurable or estimable, in accordance with the general framework in Schedule 4.

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## SCHEDULE 2

## Section 17

ENERGY CONTENT OF SELECTED FUELS FOR END USE  
CONVERSION TABLE

Energy commodity	kJ (NCV)	kgoe (NCV)	kWh (NCV)
1 kg coke	28 500	0,676	7,917
1 kg hard coal	17 200 - 30 700	0,411 - 0,733	4,778 - 8,528
1 kg brown coal briquettes	20 000	0,478	5,556
1 kg black lignite	10 500 - 21 000	0,251 - 0,502	2,917 - 5,833
1 kg brown coal	5 600 - 10 500	0,134 - 0,251	1,556 - 2,917
1 kg oil shale	8 000 - 9 000	0,191 - 0,215	2,222 - 2,500
1 kg peat	7 800 - 13 800	0,186 - 0,330	2,167 - 3,833
1 kg peat briquettes	16 000 - 16 800	0,382 - 0,401	4,444 - 4,667
1 kg residual fuel oil (heavy oil)	40 000	0,955	11,111
1 kg light fuel oil	42 300	1,010	11,750
1 kg motor spirit (petrol)	44 000	1,051	12,222
1 kg paraffin	40 000	0,955	11,111
1 kg liquefied petroleum gas	46 000	1,099	12,778
1 kg natural gas <sup>1</sup>	47 200	1,126	13,10
1 kg liquefied natural gas	45 190	1,079	12,553

<sup>1</sup> 93% methane.

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1 kg wood (25% humidity) <sup>2</sup>	13 800	0,330	3,833
1kg pellets/wood bricks	16 800	0,401	4,667
1 kg waste	7 400 - 10 700	0,177 - 0,256	2,056 - 2,972
1 MJ derived heat	1 000	0,024	0,278
1 kWh electrical	3 600	energy 0,086	1 <sup>3</sup>

Source: Eurostat.

<sup>2</sup> The competent authority may apply other values depending on the type of wood used.

<sup>3</sup> For savings in Kwh electricity, the competent authority may apply a default co-efficient of 2,5 reflecting the estimated 40% average EU generation efficiency during the target period. The competent authority may apply a different co-efficient provided it can justify it.

## SCHEDULE 3

## Section 17

**INDICATIVE LIST OF EXAMPLES OF ELIGIBLE ENERGY EFFICIENCY IMPROVEMENT MEASURES**

This Schedule provides examples of areas in which energy efficiency improvement programmes and other energy efficiency improvement measures may be developed and implemented in the context of section 4.

To be taken into account, these energy efficiency improvement measures must result in energy savings that can be clearly measured and verified or estimated in accordance with the guidelines in Schedule 4, and their impacts on energy savings must not already be counted in other specific measures. The following lists are not exhaustive but are intended to provide guidance.

Examples of eligible energy efficiency improvement measures—

**Residential and tertiary sectors**

- (a) heating and cooling (e.g. heat pumps, new efficient boilers, installation/efficient update of district heating/cooling systems);
- (b) insulation and ventilation (e.g. wall cavity and roof insulation, double/triple glazing of windows, passive heating and cooling);
- (c) hot water (e.g. installation of new devices, direct and efficient use in space heating, washing machines);
- (d) lighting (e.g. new efficient bulbs and ballasts, digital control systems, use of motion detectors for lighting systems in commercial buildings);
- (e) cooking and refrigeration (e.g. new efficient devices, heat recovery systems);
- (f) other equipment and appliances (e.g. combined heat and power appliances, new efficient devices, time control for optimised energy use, stand-by loss reduction, installation of capacitors to reduce reactive power, transformers with low losses);
- (g) domestic generation of renewable energy sources, whereby the amount of purchased energy is reduced (e.g. solar thermal

applications, domestic hot water, solar-assisted space heating and cooling);

#### **Industry sector**

- (h) product manufacturing processes (e.g. more efficient use of compressed air, condensate and switches and valves, use of automatic and integrated systems, efficient stand-by modes);
- (i) motors and drives (e.g. increase in the use of electronic controls, variable speed drives, integrated application programming, frequency conversion, electrical motor with high efficiency);
- (j) fans, variable speed drives and ventilation (e.g. new devices/systems, use of natural ventilation);
- (k) demand response management (e.g. load management, peak shaving control systems);
- (l) high-efficiency cogeneration (e.g. combined heat and power appliances);

#### **Transport sector**

- (m) mode of travel used (e.g. promotion of energy-efficient vehicles, energy-efficient use of vehicles including tyre pressure adjustment schemes, energy efficiency devices and add-on devices for vehicles, fuel additives which improve energy efficiency, high-lubricity oils and low-resistance tyres);
- (n) modal shifts of travel (e.g. car free home/office transportation arrangements, car sharing, modal shifts from more energy-consuming modes of transport to less energy-consuming ones, per passenger-km or tonne-km);
- (o) car-free days;

#### **Cross-sectoral measures**

- (p) standards and norms that aim primarily at improving the energy efficiency of products and services, including buildings;
- (q) energy labelling schemes;

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- (r) metering, intelligent metering systems such as individual metering instruments managed by remote, and informative billing;
- (s) training and education that lead to application of energy-efficient technology and/or techniques;

**Horizontal measures**

- (t) regulations, taxes etc. that have the effect of reducing energy end-use consumption;
- (u) focused information campaigns that promote energy efficiency improvement and energy efficiency improvement measures.

## SCHEDULE 4

## Section 17

**GENERAL FRAMEWORK FOR MEASUREMENT AND  
VERIFICATION OF ENERGY SAVINGS****1. Energy savings measurements and calculations and their  
normalisation.**

## 1.1. Measuring energy savings.

General

In measuring the realised energy savings as set out in section 4 with a view to capturing the overall improvement in energy efficiency and to ascertaining the impact of individual measures, a harmonised calculation model which uses a combination of top-down and bottom-up calculation methods shall be used to measure the annual improvements in energy efficiency for the EEAPs referred to in section 14.

Top-down calculations

A top-down calculation method means that the amount of energy savings is calculated using the national or larger-scale aggregated sectoral levels of energy savings as the starting point. Adjustments of the annual data are then made for extraneous factors such as degree days, structural changes, product mix, etc. to derive a measure that gives a fair indication of total energy efficiency improvement, as described in point 1.2.

This method does not provide exact measurements at a detailed level nor does it show cause and effect relationships between measures and their resulting energy savings. However, it is usually simpler and less costly and is often referred to as “energy efficiency indicators” because it gives an indication of developments.

Bottom-up calculations

A bottom-up calculation method means that energy savings obtained through the implementation of a specific energy efficiency improvement measure are measured in kilowatt-hours (kWh), in Joules (J) or in kilogram oil equivalent (kgoe) and added to energy savings results from other specific energy efficiency improvement measures. The competent authority will ensure that double counting of energy savings, which results from a combination of energy efficiency improvement measures (including mechanisms), is avoided.



For the bottom-up calculation method, data and methods referred to in points 2.1 and 2.2 may be used.

The competent authority may use further bottom-up measurements in addition to the part prescribed by the harmonised bottom-up model subject to the agreement of the European Commission, in accordance with the procedure referred to in section 16, on the basis of a description of the methodology presented.

If bottom-up calculations are not available for certain sectors, top-down indicators or mixtures of top-down and bottom-up calculations shall be used in the reports to the Commission, subject to the agreement of the Commission, in accordance with the procedure referred to in section 16.

#### 1.2. How energy savings measurements should be normalised.

Energy savings shall be determined by measuring or estimating consumption, before and after the implementation of the measure, while ensuring adjustment and normalisation for external conditions commonly affecting energy use. Conditions commonly affecting energy use may also differ over time. Such conditions may be the likely impact of one or several plausible factors, such as—

- (a) weather conditions, such as degree days;
- (b) occupancy levels;
- (c) opening hours for non-domestic buildings;
- (d) installed equipment intensity (plant throughput); product mix;
- (e) plant throughput, level of production, volume or added value, including changes in GDP level;
- (f) schedules for installation and vehicles;
- (g) relationship with other units.

## **2. Data and methods that may be used (measurability).**

Several methods for collecting data to measure or estimate energy savings exist. At the time of the evaluation of an energy service or energy efficiency improvement measure, it will often be impossible to rely only on measurements. A distinction is therefore made between methods measuring

energy savings and methods estimating energy savings, where the latter is the more common practice.

#### 2.1. Data and methods based on measurements.

##### Bills from distribution companies or retailers

Metered energy bills may form the basis for measurement for a representative period before the introduction of the energy efficiency improvement measure. These may then be compared to metered bills for the period after the introduction and use of the measure, also for a representative period of time. The findings should be compared to a control group (non-participation group) if possible or, alternatively, normalised as described in point 1.2.

##### Energy sales data

The consumption of different types of energy (e.g. electricity, gas, heating oil) may be measured by comparing the sales data from the retailer or distributor obtained before the introduction of the energy efficiency improvement measures with the sales data from the time after the measure. A control group may be used or the data normalised.

##### Equipment and appliance sales data

Performance of equipment and appliances may be calculated on the basis of information obtained directly from the manufacturer. Data on equipment and appliance sales can generally be obtained from the retailers. Special surveys and measurements may also be carried out. The accessible data can be checked against sales figures to determine the size of energy savings. When using this method, adjustment should be made for changes in the use of the equipment or appliance.

##### End use load data

Energy use of a building or facility can be fully monitored to record energy demand before and after the introduction of an energy efficiency improvement measure. Important relevant factors (e.g. production process, special equipment, heating installations) may be metered more closely.

#### 2.2. Data and methods based on estimates.

##### Simple engineering estimate data: non-inspection

Simple engineering estimated data calculation without on-site inspection is the most common method for obtaining data for measuring deemed energy

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savings. Data may be estimated using engineering principles, without using on-site data, but with assumptions based on equipment specifications, performance characteristics, operation profiles of measures installed and statistics, etc.

#### Enhanced engineering estimated data: inspection

Energy data may be calculated on the basis of information obtained by an external expert during an audit of, or other type of visit to, one or several targeted sites. On this basis, more sophisticated algorithms/simulation models could be developed and be applied to a larger population of sites (e.g. buildings, facilities, vehicles). This type of measurement can often be used to complement and calibrate simple engineering estimated data.

### **3. How to deal with uncertainty.**

All the methods listed in point 2 may entail some degree of uncertainty. Uncertainty may derive from–

- (a) instrumentation errors: these typically occur because of errors in specifications given by the product manufacturer;
- (b) modelling errors: these typically refer to errors in the model used to estimate parameters for the data collected;
- (c) sampling errors: these typically refer to errors resulting from the fact that a sample of units was observed rather than the entire set of units under study.

Uncertainty may also derive from planned and unplanned assumptions; these are typically associated with estimates, stipulations or the use of engineering data. The occurrence of errors is also related to the chosen system of data collection that is outlined in points 2.1 and 2.2. A further specification of uncertainty is advised.

The competent authority may choose to use the method of quantified uncertainty when reporting on the targets set out in this Act. Quantified uncertainty shall then be expressed in a statistically meaningful way, declaring both accuracy and confidence level. For example, “the quantifiable error is found with 90 % confidence to be  $\pm 20$  %”.

If the method of quantified uncertainty is used, the competent authority is also to take into account that the acceptable level of uncertainty required in energy savings calculations is a function of the level of savings and the cost-effectiveness of decreasing uncertainty.

#### 4. Harmonised lifetimes of energy efficiency improvement measures in bottom-up calculations.

Some energy efficiency improvement measures last for decades while other measures last for a shorter period of time. The list below gives some examples of the average lifetime of energy efficiency improvement measures:

Loft insulation of private dwellings	30 years
Cavity wall insulation of private dwellings	40 years
Glazing E to C rated (in m2)	20 years
Boilers B to A rated	15 years
Heating controls -- upgrade with boiler replacement	15 years
CFLs - retail	16 years

Source: Energy Efficiency Commitment 2005 - 2008, UK.

#### 5. How to deal with multiplier effects of energy savings and how to avoid double counting in mixed top-down and bottom-up calculation methods.

The implementation of one energy efficiency improvement measure, e.g. hot water tank and pipe insulation in a building, or another measure with equivalent effect, may have future multiplier effects in the market, meaning that the market will implement a measure automatically without any further involvement from the competent authority or any private-sector energy services provider.

A measure with multiplier potential would in most cases be more cost-effective than measures that need to be repeated on a regular basis. The competent authority shall estimate the energy savings potential of such measures including their multiplier effects and verify the total effects in an ex-post evaluation using indicators when appropriate.

With regard to the evaluation of horizontal measures, energy efficiency indicators may be used, provided that the way in which they would have developed without the horizontal measures can be determined. However, it must be possible to rule out, as far as possible, double counting with savings achieved through targeted energy efficiency programmes, energy services and other policy instruments. This applies particularly to energy or CO<sub>2</sub> taxes and information campaigns.

Corrections shall be made for double counting of energy savings. The use of matrices that enable the summation of impacts of measures is encouraged.

Potential energy savings resulting after the target period shall not be taken into account when reporting on the overall target set out in section 4. Measures that promote long-term market effects should in any case be encouraged and measures that have already resulted in multiplier energy savings effects should be taken into account when reporting on the targets set out in section 4, provided they can be measured and verified using the guidance given in this Schedule.

#### **6. How to verify energy savings.**

If deemed cost-effective and necessary, the energy savings obtained through a specific energy service or other energy efficiency improvement measure shall be verified by a third party. This may be done by independent consultants, ESCOs or other market actors. The competent authority may provide further instructions on this matter.

*Sources:* A European Ex-post Evaluation Guidebook for DSM and EE Service Programmes; IEA, INDEEP database; IPMVP, Volume 1 (Version March 2002).

**SCHEDULE 5****Section 17****INDICATIVE LIST OF ENERGY CONVERSION MARKETS AND  
SUB-MARKETS FOR WHICH BENCHMARKS CAN BE WORKED  
OUT**

1. The market for household appliances/information technology and lighting—
  - 1.1. Kitchen appliances (white goods);
  - 1.2. Entertainment/information technology;
  - 1.3. Lighting.
2. The market for domestic heating technology—
  - 2.1. Heating;
  - 2.2. Hot-water provision;
  - 2.3. Air conditioning;
  - 2.4. Ventilation;
  - 2.5. Heat insulation;
  - 2.6. Windows.
3. The market for industrial ovens.
4. The market for motorised power in industry.
5. The market for public-sector institutions—
  - 5.1. Schools/public administration;
  - 5.2. Hospitals;
  - 5.3. Swimming pools;
  - 5.4. Street lighting.
6. The market for transport services.

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## SCHEDULE 6

Section 17

**LIST OF ELIGIBLE ENERGY EFFICIENT PUBLIC  
PROCUREMENT MEASURES**

The Minister shall ensure that the public sector applies at least two requirements from the following list in the context of the exemplary role of the public sector as referred to in section 5–

- (a) requirements concerning the use of financial instruments for energy savings, including energy performance contracting, that stipulate the delivery of measurable and pre-determined energy savings (including whenever public administrations have outsourced responsibilities);
- (b) requirements to purchase equipment and vehicles based on lists of energy-efficient product specifications of different categories of equipment and vehicles to be drawn up by the competent authority, using, where applicable, minimised life-cycle cost analysis or comparable methods to ensure cost-effectiveness;
- (c) requirements to purchase equipment that has efficient energy consumption in all modes, including in standby mode, using, where applicable, minimised life-cycle cost analysis or comparable methods to ensure cost-effectiveness;
- (d) requirements to replace or retrofit existing equipment and vehicles with the equipment listed in points (b) and (c);
- (e) requirements to use energy audits and implement the resulting cost-effective recommendations;
- (f) requirements to purchase or rent energy-efficient buildings or parts thereof, or requirements to replace or retrofit purchased or rented buildings or parts thereof in order to render them more energy-efficient.