Legislation for the use Intelligent Energy in Buildings

Law	The definition ,principle , objective and scope	Application
Action Plan for Energy Efficiency: Realising the Potential COM(2006)545 final	**This Action Plan outlines a framework of policies and measures with a view to intensify the process of realising the over 20% estimated savings potential in EU annual primary energy consumption by 2020**(1.5% or 390 Mtoe per year including savings in end-use sectors and at the level of energy transformation; improvements in energy intensity of 1.8% or 470 Mtoe per year). *The Action Plan is intended to mobilise the general public and policy-makers at all levels of government, together with market actors, and to transform the internal energy market in a way that provides EU citizens with the globally most energy-efficient infrastructure, buildings, appliances, processes, transport means and energy systems. Given the importance of the human factor in reducing energy consumption, this action plan also encourages citizens to use energy in the most rational manner possible. Energy efficiency is about informed choice by individuals, not just about legislation*: -In spite of this, Europe continues to waste at least 20% of its energy due to inefficiency;The direct cost of our inability to use energy efficiently amounts to more than 100 billion euros annually by 2020 and 390 Mtoe at USD 48/barrel net of taxes(	1. **Full Energy Saving Potential 2020 (%)**: Partly because of its large share of total consumption, the largest cost-effective savings potential lies in end-use Sector- -**Households (residential)-27%; retrofitted wall and roof insulation offer the greatest opportunities;** **-Commercial buildings (Tertiary)-30%; improved energy management systems are very important.** **Primary energy consumption EU 25(1750 Mtoe) in 2005** **- Households-16%** **- Tertiary-9%** Buildings alone uses 40% of the energy consumed in the European Union. Too much energy continues to be wasted in buildings because of inefficient heating and cooling systems and lighting. 2. **Making buildings more energy efficient Priority Action 2** Building performance requirements and very low energy buildings (“passive houses”) The Commission will propose expanding the scope of the Energy Performance of Buildings Directive substantially in 2009, after its

	Realising the 20% potential 2020, equivalent to some 390 Mtoe, will result in large energy and environmental benefits. CO2 emissions should be reduced by 780 Mt CO2 with respect to the baseline scenario, more than twice the EU reductions needed under the Kyoto Protocol by 2012(corresponds to over 85%). Additional investment expenditure in more efficient and innovative technologies will be more than compensated by the more than € 100 billions annual fuel savings). **ANNEX: Proposed Measures Dynamic energy performance requirements for products, buildings and services**. • Implementation of the Eco-Design Directive (2005/32/EC) – co-ordinate eco-design requirements, labelling, and incentives (2007-2012) – develop eco-design requirements for 14 priority product groups (2007-2009) • develop eco-design requirements for additional products (2008-2010) • support self commitments to deliver energy savings (2007-2012) • implementation and amendment of the Labelling Framework Directive (92/75/EC); – propose Commission Directives for energy labelling of gas water heaters and electric water heaters (2007) – prepare additional labelling implementing measures and revise existing labels, with a view to re-scale them every 5 years with only 10 – 20 % having A-label status and verifying life-cycle costs and expected energysavings(2007-2009) – launch a comprehensive survey on the implementation of the Directive (2007) • Implementation and amendment of the Energy Star Agreement on office equipment – conclude a new 5-year Energy Star Agreement (2007) – propose amending Regulation (EC) No 2422/2001 on a Community energy efficiency labelling programme for office	complete implementation. It will also propose EU minimum performance requirements for new and renovated buildings (kWh/m²). For new buildings, the Commission will also by the end of 2008 develop a strategy for very low energy or passive houses in dialogue with Member States and key stakeholders towards more wide-spread deployment of these houses by 2015. The Commission will set a good example by leading the way, as far as its own buildings are concerned. **The Energy Performance of Buildings Directive (2002/91/EC**), to be transposed by Member States by January 2006,can play a key role in realising the savings potential in the buildings sector, which is estimated at 28%, and which in turn can reduce total EU final energy consumption by around 11%. However, to reap the full potential in the buildings sector, the Commission will propose expanding the scope of the Directive to include the large stock of smaller buildings, including by lowering significantly the current threshold from 1000 m² for minimum performance requirements for major renovations to include a majority of existing buildings. In 2009, it will also propose EU minimum performance requirements for new and renovated buildings (kWh/m²) and for components, such as windows. It will take the necessary steps, in collaboration with the building sector, to develop a deployment strategy for very low energy or passive houses, with a view to moving towards this type of houses as a standard in new construction in the medium term, as the appropriate technologies become commercially available. 3. Priority Action 3 Making power generation and distribution more efficient The Commission will by 2008 develop minimum binding efficiency requirements for new electricity, heating and cooling capacity lower than 20 MW28 and consider, if necessary, such requirements for larger production units. It will also develop with the energy supply industry guidelines on good operating practices for existing capacity to raise average generation efficiency for all plants and agree guidelines on good regulatory practices to reduce transmission and distribution losses. A proposal for a new

	equipment (2007) – develop stringer energy efficiency criteria for office equipment (2007-2011) • Implementation and amendment of the Energy End-Use Efficiency and Energy Services Directive (2006/32/EC) – prepare a Memorandum of Understanding on energy efficiency in co-operation with CEER through ERGEG(2007) – assess a Community-wide White Certificate Scheme (2008) – improve coherence of national public procurement guidelines on energy efficiency (2008) – seek agreement on more stringent and harmonised criteria for voluntary agreements to significantly increase energy efficiency (2009) – issue a mandate for a European norm (EN) for energy audits (2008) – propose more detailed metering and billing requirements (2009) – consider supporting or establishing a centre to identify and improve emerging and existing technologies (2008) • Implementation and amendment of the Energy Performance of Buildings Directive (2002/91/EC) – propose an expanded role for the public sector to demonstrate new technologies and methods (2009) – propose lowering significantly the threshold for minimum performance requirements for major renovations (2009) – propose minimum performance requirements (kWh/m²) for new and renovated buildings and some components with a target for new buildings to approach the level of passive housesfrom 2015 (2009) – consider proposing binding requirements to install passive heating and cooling technologies (by the end of 2008) – propose measures for Member States to provide financing for highly costeffective investments (2009) • Implementation of the Construction Products Directive (89/106/EEC) – introduce energy efficiency aspects in	regulatory framework to promote the connection of decentralised generation will be put forward in 2007. To improve overall efficiency in the energy transformation sector, the Commission will work closely with the energy supply and distribution industry and with the Council of European Energy Regulators (CEER) and the European Regulators Group for Electricity and Gas (ERGEG). In the framework of the implementation of the Directive on the Promotion of Cogeneration (CHP) (2004/8/EC) there is scope for reducing losses in distribution networks. To date, only around 13% of the electricity consumed in the EU is generated using this technology. Harmonising calculation methods and guarantees of origin, as well as improved metering and establishment of norms will be essential to stimulate further progress in developing cogeneration. All of these objectives will be pursued. Minimum performance requirements and regulations for district heating and micro CHP will also be proposed as from 2007. Here too, a more comprehensive list of proposed measures is set forth in the annex.- 2. Improving energy transformation • develop minimum efficiency requirements for new electricity, heating and cooling capacity lower than 20 MW and consider if necessary such requirements for larger production units (2008) • develop with supply industry guidelines on good operating practices for existing capacity (2008)

	construction product standards whenever relevant (2008)	• issue a mandate for a European Norm for a certification scheme for heat and electricity plant engineers (2008) • agree guidelines in co-operation with CEER through ERGEG on good regulatory practices to reduce transmission and distribution losses (2008) 45 With minimum need for external energy supply for heating and cooling. • propose a new regulatory framework for the promotion of grid access and connection of decentralised generation (2007) • Implementation and amendment of the Directive on the Promotion of Cogeneration (CHP) (2004/8/EC), including – accelerate harmonisation of the calculation methods for high-efficiency CHP (2008-2011) – issue a mandate for a European Norm (EN) for certification of chief engineers for CHP plants (2008) – reach agreement on a harmonised electronic Guarantee of Origin (2007-2009) – propose stricter requirements for market regulators to promote CHP (2008-2011) – propose to require Member States to identify heat demand suitable for CHP (2007-2008) – propose that Member States be required to identify in national potentials waste heat potential (2007-2008) – propose minimum efficiency requirements for district heating based on new norm (2007-2008) – seek to adopt a European Norm and a minimum efficiency requirement for micro CHP (2007-2009)
Directive 2002/91/EC on the energy	1.**The objective is to promote the improvement of the energy performance of buildings within the Community**, taking into account outdoor climatic and local conditions, as	1**. "building":** a roofed construction having walls, for which energy is used to condition the indoor climate; a building may refer to the building as a whole or parts thereof that have been designed

performance of buildings	well as indoor climate requirements and cost-effectiveness. Requirements as regards: (a) the general framework for a methodology of calculation of the integrated energy performance of buildings; (b) the application of minimum requirements on the energy performance of new buildings; © the application of minimum requirements on the energy performance of large existing buildings that are subject to major renovation; (d) energy certification of buildings; and (e) regular inspection of boilers and of air-conditioning systems in buildings and in addition an assessment of the heating installation in which the boilers are more than 15 years old. **2.Reality:** - Environmental protection requirements; -The natural resources, to the prudent and rational ,include oil products, natural gas and solid fuels, which are essential sources of energy but also the leading sources of carbon dioxide emissions. - Increased energy efficiency constitutes an important part of the package of policies and measures needed to comply with the Kyoto Protocol and should appear in any policy package to meet further commitments. - Demand management of energy is an important tool enabling the Community to influence the global energy market and hence the security of energy supply in the medium and long term. - The residential and tertiary sector, the major part of which is buildings, accounts for more than 40 % of final energy consumption in the Community and is expanding, a trend which is bound to increase its energy consumption and hence also its carbon dioxide emissions. -Directive 93/76/EEC to limit carbon dioxide emissions by improving energy efficiency (SAVE); -Directive 89/106/EEC on the approximation of laws, regulations and administrative provisions of the Member	or altered to be used separately; a. **"energy performance of a building":** 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. This amount shall be reflected in one or more numeric indicators which have been calculated, taking into account insulation, technical and installation characteristics, design and positioning in relation to climatic aspects, solar exposure and influence of neighbouring structures, own-energy generation and other factors, including indoor climate, that influence the energy demand; d. **"energy performance certificate of a building":** a certificate recognised by the Member State or a legal person designated by it, which includes the energy performance of a building calculated according to a methodology ; e.- **"air-conditioning system":** a combination of all components required to provide a form of air treatment in which temperature is controlled or can be lowered, possibly in combination with the control of ventilation, humidity and air cleanliness; **- "boiler":** the combined boiler body and burner-unit designed to transmit to water the heat released from combustion; 2. **Directive 93/76/EEC** -to develop, implement and report on programmes in the field of energy efficiency in the building sector, is now starting to show some important benefits. However, a complementary legal instrument is needed to lay down more concrete actions with a view to achieving the great unrealised potential for energy savings and reducing the large differences between Member States' results in this sector. **Directive 89/106/EEC** -requires construction works and their heating, cooling and ventilation installations to be designed and built in such a way that the amount of energy required in use will be low, having regard to the climatic conditions of the location and the occupants. **The energy performance of buildings** -A common approach to this process, carried out by qualified and/or accredited experts, whose independence is to be guaranteed on the basis of objective criteria, will contribute to a level playing field as regards efforts made in Member States to energy saving in the buildings sector and will

	States relating to construction product -The measures further to improve the energy performance of buildings should take into account climatic and local conditions as well as indoor climate environment and cost-effectiveness. They should not contravene other essential requirements concerning buildings such as accessibility, prudence and the intended use of the building. -The energy performance of buildings should be calculated on the basis of a methodology, which may be differentiated at regional level, that includes, in addition to thermal insulation other factors that play an increasingly important role such as heating and air-conditioning installations, application of renewable energy sources and design of the building. - The Commission intends further to develop standards such as EN 832 and prEN 13790, also including consideration of air-conditioning systems and lighting. -Buildings will have an impact on long-term energy consumption and new buildings should therefore meet minimum energy performance requirements tailored to the local climate. Best practice should in this respect be geared to the optimum use of factors relevant to enhancing energy performance. -Major renovations of existing buildings above a certain size should be regarded as an opportunity to take cost-effective measures to enhance energy performance. -However, the improvement of the overall energy performance of an existing building does not necessarily mean a total renovation of the building but could be confined to those parts that are most relevant for the energy performance of the building and are cost-effective. - Renovation requirements for existing buildings should not be incompatible with the intended function, quality or character of the building. It should be possible to recover additional costs involved in such renovation within a reasonable period of time in relation to the expected technical lifetime of the investment by accrued energy savings. -The certification process may be supported by programmes to facilitate equal access to improved energy performance; based upon agreements between organisations of stakeholders and	introduce transparency for prospective owners or users with regard to the energy performance in the Community property market. **Buildings** -As the application of alternative energy supply systems is generally not explored to its full potential, the technical, environmental and economic feasibility of alternative energy supply systems should be considered; this can be carried out once, by the Member State, through a study which produces a list of energy conservation measures, for average local market conditions, meeting cost-effectiveness criteria. Before construction starts, specific studies may be requested if the measure, or measures, are deemed feasible. **Major renovations** -are cases such as those where the total cost of the renovation related to the building shell and/or energy installations such as heating, hot water supply, air-conditioning, ventilation and lighting is higher than 25 % of the value of the building, excluding the value of the land upon which the building is situated, or those where more than 25 % of the building shell undergoes renovation. **The certification**- Public authority buildings and buildings frequently visited by the public should set an example by taking environmental and energy considerations into account and therefore should be subject to energy certification on a regular basis. The dissemination to the public of this information on energy performance should be enhanced by clearly displaying these energy certificates. Moreover, the displaying of officially recommended indoor temperatures, together with the actual measured temperature, should discourage the misuse of heating, air-conditioning and ventilation systems. This should contribute to avoiding unnecessary use of energy and to safeguarding comfortable indoor climatic conditions (thermal comfort) in relation to the outside temperature. -**Regular maintenance of boilers and of air-conditioning systems** by qualified personnel contributes to maintaining their correct adjustment in accordance with the product specification and in that way will ensure optimal performance from an environmental, safety and energy point of view. An independent assessment of the total heating installation is appropriate whenever replacement could be considered on the basis of cost-effectiveness. -**The billing, to occupants of buildings, of the costs of heating, air-conditioning and hot water**, calculated in proportion to actual consumption, could contribute towards energy saving in the residential sector. Occupants should be enabled to regulate their

	a body appointed by the Member States; carried out by energy service companies which agree to commit themselves to undertake the identified investments. The schemes adopted should be supervised and followed up by Member States, which should also facilitate the use of incentive systems. To the extent possible, the certificate should describe the actual energy-performance situation of the building and may be revised accordingly. -Member States may also employ other means/measures, not provided for in this Directive, to encourage enhanced energy performance. Member States should encourage good energy management, taking into account the intensity of use of buildings. -Recent years have seen a rise in the number of air-conditioning systems in southern European countries. This creates considerable problems at peak load times, increasing the cost of electricity and disrupting the energy balance in those countries. Priority should be given to strategies which enhance the thermal performance of buildings during the summer period. To this end there should be further development of passive cooling techniques, primarily those that improve indoor climatic conditions and the microclimate around buildings. **3.The methodology,at national or regional level, of calculation of the energy performance**.The energy performance of a building shall be expressed in a transparent manner and may include a CO2 emission indicator. **4.Setting of energy performance requirements**-the necessary measures to ensure that minimum energy performance requirements for buildings are set: differentiate between new and existing buildings and different categories of buildings ; shall take account of general indoor climate conditions, in order to avoid possible negative effects such as inadequate ventilation, as well as local conditions and the designated function and the age of the building; reviewed at regular intervals which should not be longer than five years and, if necessary, updated in order to reflect technical progress in the building sector. **5.**	own consumption of heat and hot water, in so far as such measures are cost effective. -In accordance with **the principles of subsidiarity** and proportionality as set out in Article 5 of the Treaty, general principles providing for a system of energy performance requirements and its objectives should be established at Community level, but the detailed implementation should be left to Member States, thus allowing each Member State to choose the regime which corresponds best to its particular situation. This Directive confines itself to the minimum required in order to achieve those objectives and does not go beyond what is necessary for that purpose. -Provision should be made for the possibility of rapidly adapting **the methodology of calculation** and of Member States regularly reviewing minimum requirements in the field of energy performance of buildings with regard to technical progress, inter alia, as concerns the insulation properties (or quality) of the construction material, and to future developments in standardisation. **3.General framework for the calculation :** 1.The methodology of calculation of energy performances of buildings shall include at least the following aspects: thermal characteristics of the building (shell and internal partitions, etc.). These characteristics may also include air-tightness; heating installation and hot water supply, including their insulation characteristics; air-conditioning installation; ventilation; built-in lighting installation (mainly the non-residential sector); position and orientation of buildings, including outdoor climate; passive solar systems and solar protection; natural ventilation; indoor climatic conditions, including the designed indoor climate. 2.The positive influence of the following aspects shall, where relevant in this calculation, be taken into account: active solar systems and other heating and electricity systems based on renewable energy sources; electricity produced by CHP- combined heat and power-the simultaneous conversion of primary fuels into mechanical or electrical and thermal energy, meeting certain quality criteria of energy efficiency; district or block heating and cooling systems; natural lighting. 3. For the purpose of this calculation buildings should be adequately classified into categories such as: single-family houses of different types; apartment blocks;offices; education buildings; hospitals;

	1.New buildings-the necessary measures to ensure that new buildings meet the minimum energy performance. 2.Existing buildings-the necessary measures to ensure that when buildings with a total useful floor area over 1000 m2 undergo major renovation, their energy performance is upgraded in order to meet minimum requirements in so far as this is technically, functionally and economically feasible. **6.Energy performance certificate** 1. When buildings are constructed, sold or rented out, an energy performance certificate is made available to the owner or by the owner to the prospective buyer or tenant, as the case might be. The validity of the certificate shall not exceed 10 years. 2. The energy performance certificate for buildings shall include reference values such as current legal standards and benchmarks in order to make it possible for consumers to compare and assess the energy performance of the building. 3. For buildings with a total useful floor area over 1000 m2 occupied by public authorities and by institutions providing public services to a large number of persons and therefore frequently visited by these persons an energy certificate, not older than 10 years, is placed in a prominent place clearly visible to the public. **7.With regard to reducing energy consumption and limiting carbon dioxide emissions:** 1.Inspection of boilers (a) lay down the necessary measures to establish a regular inspection of boilers fired by non-renewable liquid or solid fuel of an effective rated output of 20 kW to 100 kW. Such inspection may also be applied to boilers using other fuels or (b) take steps to ensure the provision of advice to the users on the replacement of boilers, other modifications to the heating system and on alternative solutions which may include inspections to assess the efficiency and appropriate size of the boiler. 2.Inspection of air-conditioning systems-the necessary measures to establish a regular inspection of air-conditioning systems of an effective rated output of more than 12 kW-(the	hotels and restaurants; sports facilities; wholesale and retail trade services buildings; other types of energy-consuming buildings. **4.Not to set or apply the requirements** - buildings and monuments officially protected as part of a designated environment or because of their special architectural or historic merit, where compliance with the requirements would unacceptably alter their character or appearance, buildings used as places of worship and for religious activities,temporary buildings with a planned time of use of two years or less, industrial sites, workshops and non-residential agricultural buildings with low energy demand and non-residential agricultural buildings which are in use by a sector covered by a national sectoral agreement on energy performance, residential buildings which are intended to be used less than four months of the year,stand-alone buildings with a total useful floor area of less than 50 m2. **5.** 1.For new buildings with a total useful floor area over 1000 m2, that the technical, environmental and economic feasibility of alternative systems (such as:decentralised energy supply systems based on renewable energy,CHP, district or block heating or cooling, if available,heat pumps- a device or installation that extracts heat at low temperature from air, water or earth and supplies the heat to the building, under certain conditions)is considered and is taken into account before construction starts. 2. The requirements may be set either for the renovated building as a whole or for the renovated systems or components when these are part of a renovation to be carried out within a limited time period, with the abovementioned objective of improving the overall energy performance of the building. **6.** 1. Certification for apartments or units designed for separate use in blocks may be based: on a common certification of the whole building for blocks with a common heating system, or on the assessment of another representative apartment in the same block. 2. The certificate shall be accompanied by recommendations for the cost-effective improvement of the energy performance.The objective of the certificates shall be limited to the provision of information and any effects of these certificates in terms of legal proceedings or otherwise shall be decided in accordance with

	maximum calorific output specified and guaranteed by the manufacturer as being deliverable during continuous operation while complying with the useful efficiency indicated by the **manufacturer).** **8.** 1.Review- make proposals with respect to, inter alia: possible complementary measures referring to the renovations in buildings with a total useful floor area less than 1000 m2; general incentives for further energy efficiency measures in buildings. 2.Information-the necessary measures to inform the users of buildings as to the different methods and practices that serve to enhance energy performance. 3.Transposition-the laws, regulations and administrative provisions at the latest on 4 January 2006.	national rules. 3. The range of recommended and current indoor temperatures and, when appropriate, other relevant climatic factors may also be clearly displayed. **7.** 1.a) Boilers of an effective rated output of more than 100 kW shall be inspected at least every two years. For gas boilers, this period may be extended to four years. For heating installations with boilers of an effective rated output of more than 20 kW which are older than 15 years-yhe necessary measures to establish a one-off inspection of the whole heating installation. On the basis of this inspection, which shall include an assessment of the boiler efficiency and the boiler sizing compared to the heating requirements of the building, the experts shall provide advice to the users on the replacement of the boilers, other modifications to the heating system and on alternative solutions; 2. This inspection shall include an assessment of the air-conditioning efficiency and the sizing compared to the cooling requirements of the building. Appropriate advice shall be provided to the users on possible improvement or replacement of the air-conditioning system and on alternative solutions. **8.2. Upon Member States' request**, the Commission shall assist Member States in staging the information campaigns concerned, which may be dealt with in Community programmes.
Directive 2006/32/EC **on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC**	1.In the Community there is a need for improved energy end-use efficiency, managed demand for energy and promotion of the production of renewable energy, as there is relatively limited scope for any other influence on energy supply and distribution conditions in the short to medium term, either through the building of new capacity or through the improvement of transmission and distribution. **This Directive thus contributes to improved security of supply.** Improved energy end-use efficiency will also contribute to the reduction of primary energy consumption, to the mitigation of CO2 and other greenhouse gas emissions and thereby to the prevention of dangerous climate change. These emissions continue to increase, making it more and more difficult to meet the Kyoto	1.**General target-** Member States shall adopt and aim to achieve an overall national indicative energy savings target of 9 % for the ninth year of application of this Directive, to be reached by way of energy services and other energy efficiency improvement measures. Member States shall take cost-effective, practicable and reasonable measures designed to contribute towards achieving this target. 2. **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); © hot water (e.g. installation of new devices, direct and efficient use

	commitments. Human activities attributed to the energy sector cause as much as 78 % of the Community greenhouse gas emissions. 2.**Indicative list of examples of eligible energy efficiency improvement measures.**	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)
Directive 2004/8/EC **on the promotion of cogeneration based on a useful heat demand in the internal energy market and amending Directive 92/42/EEC**	The purpose of this Directive is to increase energy efficiency and improve security of supply by creating a framework for promotion and development of high efficiency cogeneration of heat and power based on useful heat demand and primary energy savings in the internal energy market, taking into account the specific national circumstances especially concerning climatic and economic conditions. 1.The potential for use of cogeneration as a measure to save energy is underused in the Community at present. Promotion of high-efficiency cogeneration based on a useful heat demand is a Community priority given the potential benefits of cogeneration with regard to saving primary energy, avoiding network losses and reducing emissions, in particular of greenhouse gases. In addition, efficient use of energy by cogeneration can also contribute positively to the security of energy supply and to the competitive situation of the European Union and its Member States. It is therefore necessary to take measures to ensure that the potential is better exploited within the framework of the internal energy market. 2. Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings(14) requires the Member States to ensure that for new buildings with a total useful floor area of over 1000 m2, the technical, environmental and economic feasibility of alternative systems, such as cogeneration of heat and power,	1.The definition of "small scale cogeneration"- cogeneration units with an installed capacity below 1 MWe comprises, inter alia, micro-cogeneration- a cogeneration unit with a maximum capacity below 50 kWe and distributed cogeneration units such as cogeneration units supplying isolated areas or limited residential, commercial or industrial demands. 2. Member States operate different mechanisms of support for cogeneration at the national level, including investment aid, tax exemptions or reductions, green certificates and direct price support schemes. 3. Especially for small scale and micro-cogeneration units access to the grid system of electricity produced from high-efficiency cogeneration may be facilitated subject to notification to the Commission.

	is considered and taken into account before construction starts.	
GREEN PAPER **A European Strategy for Sustainable, Competitive and Secure Energy-** COM(2006) 105 final	**This Green Paper puts forward suggestions and options that could form the basis for a new comprehensive European energy policy** 1. Competitiveness and the internal energy market 2. Diversification of the energy mix 3. Solidarity 4. Sustainable development. 5. Innovation and technology 6. External policy Europe's energy policy should have three main objectives: -Sustainability -Competitiveness -Security of supply	**a.Energy for growth and jobs in Europe**: completing the internal European electricity and gas markets- In July 2007, with very few exceptions, every EU consumer will have the legal right to purchase electricity and gas from any supplier in the EU. **b. Making more from less**: leading on energy efficiency The Action Plan will propose concrete measures to reach this 20% potential by 2020. Examples of possible action include: – Long-term targeted energy efficiency campaigns, including efficiency in buildings, notably public buildings. **c. Increasing the use of renewable energy sources**- Research, demonstration and market replication initiatives to bring clean and renewable energy sources closer to markets.
GREEN PAPER on energy efficiency or doing more with less- COM(2005) 265 final (With today's most advanced technology - reduction of the energy consumption by 20 % compared to the projections for 2020 on a cost-effective basis. Total consumption is currently around 1725 Mtoe and consumption will reach 1900	1.**The European Union to make a strong push towards a re-invigorated programme promoting energy efficiency at all levels of European society** - currently consume around 1 725 Mtoe of energy per year- price tag of EUR 500 billion, or more than EUR 1000 per person per year. Of this EUR 500 billion, around EUR 240 billionon the trade bill. 2. **Identifying the obstacle**- Energy consumption is also a major contributor to climate change, which is the cause of increasing concern over recent years.Energy is the source of 4/5 (78 %) of total greenhouse gas emissions in the EU; According to many experts, known oil reserves are only enough to cover today's needs for about 40 years. 3. **European initiative**- Specific energy policy measures. In Europe, a large proportion of this energy continues to be wasted, whether by inefficient equipment or through lack of awareness of energy users. This represents a cost with no benefit, whether the waste occurs at the point of production or use. This enormous loss of capital could be put to other uses, including developing new energy-efficient practices, technologies and investments.	1-**Competitiveness and the Lisbon agenda**. According to numerous studies (2), the EU could save at least 20 % of its present energy consumption in a cost-effective manner, equivalent to EUR 60 billion per year, or the present combined energy consumption of Germany and Finland; -Environmental protection and the EU's Kyoto obligations. Energy saving is without doubt the quickest, most effective and most cost-effective manner for reducing greenhouse gas emissions, as well as improving air quality, in particular in densely populated areas; -Security of supply. By 2030, on the basis of present trends, the EU will be 90 % dependent on imports for its requirements of oil and 80 % dependent regarding gas. 2. **Information and education**: two underused tools- information to citizens on issues such as how to reduce energy consumption in homes, through, for example, efficient lighting and heating and sensible purchasing decisions. 3. **The directives on the energy performance of buildings and on combined heat and power generation**, combined with new measures, could lead to annual savings of an average of 1.5 % per year, which in turn would allow the EU-25 to return to its 1990 consumption . 4.**The implementation of the Directive on the energy performance**

Mtoe in 2020- The objective is thus to arrive, thanks to energy savings of 20 % at the consumption level of 1990, i.e. 1520 Mtoe).

Potential savings in Mtoe	**2020 Rigorous implementation of adopted measures**	**2020+ Implementation of additional measures**
Buildings: heating/cooling	**41**	**70**
Electrical appliances	**15**	**35**
Industry	16	30
Transport	45	90
CHP	40	60
Other energy transformation, etc.	33	75
Total energy savings	190	360

of buildings (2002/91/EC), as from 2006, will permit a gain estimated at some 40 Mtoe (Megatons of oil equivalent) between now and 2020:
-for developing the framework for an integrated calculation methodology of the energy performance of buildings. Around 30 European (CEN) standards have been developed;
- requires the energy performance certification of buildings of more than 50 m² when they are constructed, sold or rented out. The certificates must be accompanied by recommendations for the cost-effective improvement of the building's energy performance. The current directive only applies to buildings under renovation of more than 1 000 m2;
- the technical potential of this directive could be enormous if its rules were applied to all renovations. In economic terms, the biggest opportunity is in coupling measures for energyefficiency improvement with retrofitting;
-with cost-effective gains conservatively estimated at more than 70 Mtoe, this sector alone could create at least 250 000 full time jobs- The gains in employment are for highly qualified personnel and for the building profession in general;
-around a third of the energy used by a building goes into lighting. Potential savings can run to 50 % or even more, as shown by several projects carried out under the framework of the 'European GreenLight Programme'. To realise this potential and to meet increasing demand, Europe could show the way by promoting the use and further development of more modern and intelligent lighting
5**.Domestic appliances** -Since 1992, a framework directive allows Member States to oblige the provision of information to consumers on the energy efficiency of a whole range of electrical appliances via labelling. However, a new approach has been proposed by the newly adopted directive on eco-design, setting requirements for eco-design applicable to consumer electrical appliances-
-one of the aims of the directive is to apply the requirements for energy efficiency while, at the same time, avoiding negative consequences of other aspects of the environment or other stages in the life cycle of the appliances.