BRIEFING: The European Union’s energy policy and climate change: Why acting now will help save the climate and benefit the EU economy

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The problem and the solutions

Climate change represents a real threat for Europe and its citizens. A European Environment Agency (EEA) report issued in August 2004¹ lists the dangers: more frequent and economically costly storms, floods, droughts and other extreme weather events. More frequent and intense heat waves like that of the summer 2003, posing a lethal threat to the elderly and frail. Melting glaciers, with three-quarters of those in the Swiss Alps likely to disappear by 2050. Rising sea levels for centuries to come and impacts on agricultural yields. And Europe is warming faster than the global average. So for the EU, continuing its efforts at the forefront of global climate policy is no selfless act – but rather something very much in the national interest of all EU Member States.

The Intergovernmental Panel on Climate Change (IPCC) predicts that global temperatures may increase by between 1.4 and 5.8 degrees Celsius by the end of the century in the absence of policy measures. There is now a growing consensus among scientists and the climate change policy community that any warming of 2 degree Celsius or more over pre-industrial temperatures will have intolerable effects in many parts of the world. Staying well below 2 degree Celsius warming is likely to require cuts of greenhouse gas emissions of about 30%² below 1990 emission levels in the OECD and the enlarged EU by 2020³.

In order to reach these goals, markets needs clear and long term signals for the promotion of renewable and efficient energy technologies (chiefly wind, biomass and solar thermal). This should be done through a European commitment to long-term targets for renewable energy in Europe. A shift from oil and coal to less polluting natural gas, and the increased use of efficient Combined Heat and Power technology is an additional bridging strategy. These will be helped through an effective implementation of the Emissions Trading Directive and the Cogeneration Directive.

In addition, more efforts are needed to reach the large existing cost-effective potential for energy conservation, which is generally set between 20%⁴ and 30%⁵ of current energy demand, with the technical potential being much higher.

² The EU has already committed through the Kyoto Protocol to reducing its greenhouse gas emissions by 8% in 2008-2012 compared to 1990 levels. In 2000, only 6 countries were on track towards achieving their targets and only Germany, Sweden and the UK projected that their existing policies and measures would be sufficient to reach their goals. Most other countries have to take on new initiatives and policies in order to achieve their commitments. European Environment Agency, “Greenhouse gas emission trends and projections in Europe”, 2002
³ The German government has already announced a national target of 40% reduction of greenhouse gas emissions within the next 15 years dependent on the EU to accept an overall 30% cut. In July 2004, Dutch environment minister Pieter Van Geel also called for global agreement to cut greenhouse gases 30% by 2020 from a 1990 baseline.
⁵ Statement by Stephan Thomas of the Wuppertal Institute, Public Hearing in the European Parliament, 2004. In addition, a study written for WWF by Dutch consultants Ecofys highlights that, through the extension to the whole of the EU of a number of policies already tested in some Member States, a 50% reduction in greenhouse gas emissions for the power sector is feasible and cost-effective by 2020. However, the study highlights that this requires
A boost in energy efficiency represents a “win-win” solution that can also help improve the economic competitiveness of the Union. For example, the Directive on Energy End-Use Efficiency and Energy Services, if adequately improved and implemented, could bring a net economic gain for the EU economy of at least €10 billion/year and reduce energy import dependency while delivering more than half of the Kyoto target reductions.  

At the same time, there are frequent calls for incentives for supply-side investments in new power generation and high-voltage electricity grid lines – the main aim of the Directive on Security of Electricity Supply. Some of these investments are necessary, especially given the need to replace power plants reaching the end of their lifetime with cleaner and more efficient plants, and to integrate wind power and other renewable energy investments into the grid.

However, increasing policy efforts on the demand side makes more economic sense than focusing solely on new investments in infrastructure. There are many existing cost-effective technologies that can be easily promoted through policy measures and incentives. The average cost in many Member States of saving a unit of electricity in the domestic sector is around 2.6 euro cents/kiloWatt-hour, compared to the average price for the generation and delivery of electricity of 3.9 euro cents/kWh. And every Euro invested in energy efficiency delivers seven times as much CO2 reductions as a Euro invested in nuclear power generation capacity.

Opportunities to save energy are abundant. If each household in the EU was encouraged - through tax breaks, subsidies or other incentives under the Directive on Energy End-Use Efficiency and Energy Services - to replace only three/four old light bulbs with super-efficient compact fluorescent lamps, we could avoid the construction of dozens of new large power plants. If, through the Eco-Design of Energy Using Products Directive, Europe asked appliance manufacturers to design products with a lower energy losses when they are switched off (but still on “stand-by”, therefore wasting electricity), we could save up to 13% of domestic electricity consumption. This would avoid the need for constructing several large power stations around Europe, avoiding a lot of local pollution and emissions into the atmosphere. It would reduce imports of fossil fuels, with benefits for our economies. By reducing the “peak load” (the peaks of electricity demand at various times of the day), it would also contribute to reducing the risk of blackouts.

With current high oil and coal prices hitting European industry and the economy, and with the danger of unmitigated climate change becoming a reality within our lifetimes, it is time for European institutions to act and strengthen existing policies under discussion, as illustrated below.

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6 SAVE study, “Completing the Market for Least-Cost Energy Services, Wuppertal Institute, 2000
7 both prices refer to off-peak power. Peak power generation is even more expensive.
Directive on End-Use Efficiency and Energy Services

As mentioned above, the Directive, if adequately improved and implemented, could bring a net economic gain for the EU economy of at least €10 billion/year and reduce energy import dependency while delivering an emission reduction of 230 Mt CO₂eq in a period of 10 through programmes and services to promote energy efficiency which would produce yearly savings of 1 %. This is the equivalent more than half the Kyoto target.

The Directive currently sets a target of 1% a year reduction, compared to a baseline (or against Business-As-Usual in case of economic growth, see below), of the amount of energy distributed and/or sold to final customers for a test period between 2006 and 2012. The savings target rises to 1.5 % a year for energy distributed and/or sold to the public sector.

There are several issues threatening this target’s effectiveness:

- A 1% target, even if against a baseline, is not ambitious enough in the context of long-term climate policy. According to data from the Wuppertal Institute, at least 2% per cent of additional savings in energy consumption can be achieved in the EU-15 yearly through energy efficiency.

- The potential for energy savings is much larger in some new Member States, which are currently suffering from very high energy intensities. Although the intensity has decreased since the early nineties (mainly because of economic restructuring rather than specific reforms), they still use twice as much energy for each unit of GDP as the EU-15 countries. This represents not only an environmental problem but also a concern for the economy and fuel import dependence of the EU-25 as a whole. For these countries, a 1% target fails to capture the huge potential for demand savings and will fail to boost the growth of a market for energy services.

WWF urges Member States, the European Commission and the European Parliament to raise the target to at least 2%9 (2.5%10 for the public sector). For the benefit of the whole of the EU-25’s economic competitiveness and climate protection, new Member States with high energy intensities could voluntarily take on stronger targets.

- The current target also allows countries to transform what would otherwise be an absolute target into a 1% against Business-As-Usual in case of strong economic growth, “if they can prove that without demand reduction policies consumption would have been higher”. However, future demand projections are very often over-estimated and it is always possible to prove that demand would have been higher. 11

The target must be considered absolute, without exemptions in the case of economic growth. This would be in line with the principles of the Emissions Trading Directive, which sets absolute caps. The atmosphere and the climate system are regulated by very specific laws of nature, unrelated to our economic cycle.

- A further weakness is that member states may take into account energy savings resulting from initiatives preceding the enforcement of the Directive, as far back as 1991. This is unacceptable because these measures will anyway already be accountable for the Kyoto commitments. The aim of this Directive is to have new and additional energy demand reductions.

WWF recommends taking into account measures only back to 2000. This will also save enormous administrative loads and questionable methods to calculate the impact of early measures.

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9 Given a cost-effective demand reduction potential of 30% and an average technology turnover of 20 years, 2% is an achievable target.

10 This is consistent with results achieved in some local authorities around Europe, which have reduced demand by 15-45% in 10-15 years. From the SAVE study: “Harnessing the Power of the Public Purse. Final report from the European PROST study on energy efficiency in the public sector,” 2003.

11 In the case of Belgium, for example, electricity demand has already been reduced by 1% per year below the projections on demand growth that were made in 1995 for the period 1995-2001. This target would thus amount to mere Business-As-Usual.
“Horizontal measures” such as taxes, regulation, standards and norms are also eligible to be calculated towards the target. However, the savings deriving from these measures are difficult to quantify. In addition, if all these measures are included then the target would have to be much higher than 1%, and even much higher than 2%. Therefore, considering that these measures are covered under other Directives, in order to avoid double-counting, WWF suggests to delete the reference to horizontal measures.

Despite the above mentioned weaknesses, institutions will come under pressure to water down the target. Among other things, there are proposals to modify the target into an energy intensity target. The electricity industry through its representative body Eurelectric has gone as far as suggesting the target should be deleted altogether.

Firstly, a bottom-up target is preferable to an energy intensity target as it enables easier calculation of results of individual programmes, which enables more effective monitoring. It is simply not feasible to start from the behaviour of the entire economy to get down to estimate the effects of single programmes. Especially so when the savings target of each programme and also of the entire Directive is so low compared to total energy consumption.

Secondly, the target must be maintained. Eurelectric’s argument that a target is against the principles of the liberalised market is mistaken. Given that in many Member States there are already targets for energy efficiency, a harmonised EU target actually contributes to the creation of a level-playing field. This way, companies operating in countries with targets are not at a competitive disadvantage compared to companies in countries with no target.

In addition, the industry criticism is based on the mistaken assumption that the creation of a liberalised market in electricity is a goal that should always override any other public policy aims. On the contrary, the right of the public to be protected from climate change must not be neglected. Although opening up the market is a useful goal that WWF supports, protection against climate change is a very serious threat to the wellbeing of European citizens that warrants adequate policy responses rather than being relegated to a mere “afterthought” with a fairly low priority level.

Eurelectric’s stated fear that the electricity industry is being targeted by an “impressive and challenging raft of legislation” is exaggerated. Many industry analysts believe that most utilities will be able to cover costs and in some cases actually make comfortable profits from the introduction of the EU Emissions Trading scheme, with operating margins at existing plants increasing by 40% or more.

Other changes needed:

- The Directive states that the costs of measures taken under this Directive should not exceed benefits (article 4.1).

This wording needs to be deleted, given that traditional cost-benefit analyses are unsuitable for addressing the complexity of climate change policy. In particular, a strict cost-benefit approach will fail to take into account the external costs of power generation and the financial benefits of climate change mitigation, including avoided costs for society as a whole due to lower climate change impacts on and human activities, ecosystems and natural resources.

- Energy sales companies shall provide free energy audits as long as 5% of their customers are not covered by energy services.

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12 Annex III.2
14 Bottom up: where the total energy demand is calculated by summing up the result of individual programmes.
15 See for example this analysis from McKinsey http://www.energyforum.net/feature/feat240.shtml
WWF recommends that an incremental percentage of sales to private households (in energy units, not in customers) should be covered by energy services. A target of 5% could be a start in 2006, followed by 7% in 2007 and up to 17% in 2012.

Please note that Eurelectric’s opposition to energy audits is contradictory. The organisation stresses as one of its main proposals that creating awareness of energy efficiency should be one of the main tools of the Directive (instead of specific measures such as targets, metering, audits and disclosure of efficiency information on electricity bills). But how are customers supposed to have increased awareness of their energy use patterns without access to more information through audits and disclosure of information on bills or better metering?

- Efficient motor drives are an efficient technology that allows industry to save money and improve their environmental performance. They are not specifically mentioned in this Directive, as there is an intention not to target sectors that fall under the Emissions Trading system.

However, given not all industry falls under the Emissions Trading Directive and that efficient motors are a cost-effective technology can help improve the energy bills of companies, this Directive should also promote efficient motor drives.
Directive on Security of Electricity Supply and Infrastructure Investment

Late in 2003 the Commission also proposed a new Directive on Security of Electricity Supply and Infrastructure Investment. The Directive is mainly aimed at promoting new infrastructure investments in the electricity sector with the stated aim of reducing Europe’s potential vulnerability to supply disruptions, such as blackouts.

- This Directive suffers from an excessive focus on supply-side options, such as the promotion of electricity “super-highways” (especially through the Trans-European Networks-Energy). This approach is may incentivise further growth in demand. An incentive to increase interconnection may result in an incentive to increase cheap and subsidised imports from certain parts of Europe where there is overcapacity, such as areas where there is nuclear production (which often operates in baseload). This may act as a disincentive to promote domestic renewable energy and it may have market distortive effects by providing a direct subsidy to nuclear power production and export.

The effects of the Commission’s proposals for increased interconnection on the Member States’ fuel mix and on renewable energy and energy efficiency policy must be analysed before any public money is spent or other types of incentives given to private operators.

- By adding power export/import capacity infrastructure to the national grids, nothing is done to address a key cause for power blackouts: a highly centralised power system with remote large capacities feeding into an international grid. Often during blackouts the only areas that remain supplied with electricity are those supplied with off-grid or distributed energy production (e.g. cogeneration plants) that are close to the demand source and do not need expensive high-voltage grid lines.

This Directive must promote actively promote distributed power systems, off-grid micro CHP and renewable power supply. Any use of Structural funds, European Investment Bank funding or financing of investments through the electricity grid tariffs must be primarily addressed towards demand-side action and the integration of renewables on the grid. The Directive must actively give priority to energy conservation and efficiency policy before promoting new supply infrastructure. It will also reduce electricity demand peaks, contributing substantially to the reduction of blackout risks.

- Promoting demand management versus incentivising new supply is also far more cost-effective. The average cost in many Member States of saving a unit of (off-peak) electricity in the domestic sector is around 2.6 euro cents/kWh, compared to the average (off-peak) price for delivered electricity of 3.9 euro cents.

Any public or consumer-financed (through grid tariffs) funds invested in the infrastructure projects must be subject to an environmental impact assessment - with a focus on both environmental impacts and benefits. The investments envisaged under the Trans-European Networks-Energy must be approved only if there are no demand-side options to be pursued through energy efficiency programmes or services or if they are considered to be vital for the successful integration of wind power onto the grid.

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17 There are considerable concerns on the stability of large interconnected grids increasingly transporting electricity over very long distances. A UCTE report on the Italian blackout acknowledges that the instability to the grid caused by the transfer of large quantities of electricity over large distances was among the causes of the Italian blackout. This constitutes a severe and systemic problem to the stability of the EU electricity system and thus to security of supply. The Commission’s draft proposal and the philosophy underlying the whole TEN-E exercise simply ignores this problem. In addition, it fails to tackle problems that genuinely need to be solved in order to avoid supply disruptions. As highlighted in a report by the Council of European Regulators (CEER, “Lessons drawn from recent incidents,” October 2003. Available on http://www.ceer.eu.org, many issues to be solved in order to avoid electric power blackouts are of a regulatory rather than infrastructure nature. These are, for example, the need to promote transparency and third party access to optimise the use of existing grid infrastructure and to improve the coordination between grid operators. This was one of the main causes of the Italian blackout of 2003 UCTE, “Interim Report of the Investigation Committee on the 28 September 2003 Blackout in Italy”, October 2003, p.44
18 IEA, 2003 available on http://www.iea.org/hurry
19 The average on-peak price is 10.2 euro cents/kWh. (Source: OFFER and National Audit Office, UK 1998 and 2003).
Directive on Eco-Design of Energy Using Products


Whereas the European Parliament earlier this year strengthened the Commission proposal at its first reading vote, the Council rejected many of the Parliament’s amendments. MEPs therefore have a key role in securing the integrity of the Directive by reinstating key amendments at second reading.

In the global context, electricity use is the fastest growing end energy use category – before transport. Most of the increase in non-industrial power demand originates from five product/service categories: household appliances (white ware); TV, video equipment and stationary audio systems; Information and Communication Technology (ICT) products, lighting and standby power. A recent study for Germany\(^{20}\) has come to the conclusion that electricity demand for ICT alone will increase by 46% until 2010. This is equivalent to an annual growth of 4.3%. This growth will mainly be driven by certain product categories which will cause more than half of the demand in 2005, such as TVs, stationary audio equipment, computer servers in offices and mobile communications infrastructure.

Further, analysis by the International Energy Agency\(^{21}\) concludes that energy demand of almost all product categories in domestic use will increase under a Business-as-Usual scenario. However, the study also highlights the considerable potential to reduce energy demand as calculated in the Least Life-Cycle Cost (LLCC) scenario\(^{22}\) at a negative cost to society.

The potential savings of all equipment in the LLCC scenario add up to 62% of all potential savings.

The two categories with both the highest increase and the highest savings are lighting and standby. TV (in on-mode) and clothes drying offer also a significant amount of potential savings. In addition, the efficiency of air conditioning must be tackled, as air conditioning is an important cause of the existing and projected growth in electricity consumption in southern and central Europe. This trend is likely to continue, especially if heat waves such as the one Europe experienced in the summer 2003 will happen with more frequency, as scientists predict.

How to improve the Directive

- **clarify its environmental goals and its priority target products**, which in the current draft are unclear (goals) or missing (products). A suggested list of products is provided at the end of this text.
- **reduce excessive emphasis on voluntary agreements**. A study from the Fraunhofer Institute of Germany\(^{23}\) on energy efficiency policy showed that while voluntary agreements can be useful in some cases, regulation is what tends to have a relevant impact. The OECD also recently issued a report analysing voluntary agreements for environmental policy making that have been negotiated around the world, concluding that often they tend not to go beyond business as usual.\(^{24}\)
- **establish a fixed principle** for setting the minimum energy efficiency standards (MEPS). The MEPS should then be set at levels, which generally correspond to the least life cycle cost (for appliances). By setting the energy efficiency requirement at this level, the directive accepts the idea that products may become more expensive to the consumer but only as long as the lower running cost due to energy savings compensates the extra incremental purchase cost.

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\(^{22}\) Least life-cycle cost – An analysis used by the IEA to calculate what efficiency levels could be achieved at negative costs for society. The technical potential is likely to be much higher.

\(^{23}\) Fraunhofer Institute, 2003.

The product coverage should be based on a “systematic” approach. Each end-use should be addressed every four years through a thorough independent analysis, unless there is clear evidence that technological progress for the energy-using product is such that updating it would only marginally change the requirement. There should also be an on-going evaluation of market-efficiency trends and programme implementation.

Leave open the possibility to go beyond the minimum life-cycle cost (for very expensive ICT equipment, for example, the LLCC may not be the best option), as is common and justifiable for environmental problems such as climate change. The external cost of carbon dioxide emissions should be included in the base-cost calculation (and not only as a sensitivity analysis as Annex II proposes). The estimate for the cost could then be re-evaluated in the future according to the understanding of these costs and also to the costs of alternative emission reduction options.

Include a 0.5-1 Watt target for stand-by power in the MEPS and appliance labelling setting process. For ICT products, off-mode consumption should, as a general principle, be eliminated as this serves no function whatsoever and its elimination represents a negligible cost for the manufacturer.

Establish an open, transparent and adequately staffed and resourced MEPS-setting process (which is not the case today in the European Union). Without adequate resources, the Commission and member states will not be able to make informed decisions on the potentials for improvement and on the adequate level of ambition.

Introduce international best-practice and best-available technology (BAT) benchmarking in a specific article to guarantee that the proposed directive aims to promote the best technologies and the best practice to the European consumers. How can Europe claim to be “energy intelligent” without international benchmarking? This practice is already in place in Australia.

Formally acknowledge the conflicting interests and advocacy roles of industry (manufacturers of end-use equipment as well as energy utility companies) and the energy efficiency/environmental advocates. For example, if the Commission involves manufacturing industry stakeholders in Comitology procedures, it should also make sure that energy efficiency advocates have equal access to the negotiations. Specific funding should also be allocated for the creation of an energy efficiency advocacy network.

Ensure consistency and complementarity of MEPS with energy labelling. The Directive should mention the need for the Commission to propose as soon as feasible a Directive on Energy Labelling.

A list of priority appliances should be included in the text of the Directive, without prejudice to future changes in technological development, especially in the very dynamic ICT sector, which may require an “early warning” system and an amendment of this priority list. This list should include initially at least:

- light sources
- household light fixtures
- household air conditioners
- commercial building heating, ventilation & air conditioning (HVAC) systems
- commercial building lighting systems and components

Recommendations from IEA, “International Labels and Standards”, 2000, p.33. Other recommendations in this list were kindly suggested by Prof Kornelis Blok of Ecodef.

There may be a need to take measures to ensure the consistent quality of the analysis. For example: establishing a set of guidelines on the required analytical steps; building a pool of qualified experts to support the activities and decisions of national civil servant appointees and establishing a consistent technical peer-review process.

According to a recent study by the Oxford Institute for Environmental Change, LLC minimum efficiency standards set in the past have not led to higher prices for appliances and given the urgency of climate change policy, there should be a more ambitious approach in the future, including equal or additional life cycle cost-based minimum standards. P.Schiellerup, “An examination of the effectiveness of the EU minimum standard on cold appliances: the British case”, Energy Policy 30 (2002).

As a proxy, ranges between 1-15 Euro cents/Kilowatt-hour could be used, in line with DG Research’s “External Costs: Research Results on Socio-Environmental Damages due to Electricity and Transport”, 2003, p.13.

A large number of electronic products, such as electrical products and small household appliances, cannot be really switched off without being unplugged. This means that they consume power 24 hours a day, not only when they’re in use, but also when the power is off.

When in off-mode the appliance doesn’t fulfill any tasks (whereas when on stand-by it fulfills at least one function, although not its main purpose), it seems to be switched off but it is still using energy. For more information: “Off mode power consumption: the most hidden part of standby losses - An analysis of German households” by Clemens Cremer and Ulla Bode, Fraunhofer Institute Systems and Innovation Research.

Please note that recently the DOE (US Department of Energy) and IEC (International Electrotechnical Commission) have defined stand-by and off-mode as “the lowest power consumption mode which cannot be switched off by the user and may persist for an indefinite time when the appliance is connected to the main electricity supply and used in accordance with the manufacturer’s instructions”, abandoning the distinction between the two operation modes.

As recommended in the above mentioned Fraunhofer, 2003 study, p.39
Other energy policy initiatives

Further policies on energy may soon emerge. Please note that these are a high priority for WWF. However, in this briefing they are being given less space as they do not yet have a legislative nature, unlike the Directives highlighted above. However, WWF believes the European Parliament has a key role to play in ensuring that debate on these issues moves in the right direction.

- Based on a review of implementation of existing targets until 2010, the Commission by 2007 will table a proposal for **new renewable energy targets for 2020**. WWF’s analysis has shown that - when combined with strong energy efficiency measures - the EU-25 can meet by 2020 a 25% share of renewable energy of all primary energy supply, most of it from sustainable biomass, wind and solar-thermal. The European Parliament will play a key role in ensuring such new renewable energy legislation is both ambitious and helps to create a level playing field with other energy sources. The latter either largely enjoy various subsidies or produce external costs (health impacts, toxic waste, global warming etc.) to the detriment of the entire economy that are not included in the overall energy prices. That means maintaining financial and other support mechanisms for renewables, removing barriers to structural planning and electricity grid integration and preferred grid access for clean power over conventional fuels.

- The Commission next year will also produce an **“Action Plan” for the promotion of biomass**. Recent analysis made it very clear that existing renewable energy targets in the electricity sector for 2010 as well as future targets are unlikely to be met in many Member States unless biomass use is expanded. The Parliament should make sure that this Action Plan reflects the large potential of biomass not only to reduce the use of conventional fuels but also to contribute to a sustainable agriculture system and the creation of jobs in rural areas.

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