Annex

Contribution of SenterNovem, Agency of the Dutch Ministry of Economic Affairs, on the EC-Green Paper on Energy Efficiency

General

It is very positive to see the renewed attention for energy efficiency within the Commission. In the past decades, Member States and the EU have already made significant progress in furthering energy efficiency. As a result, the energy-intensity of the EU-economies has declined in this period.
These efforts need to be continued, for the sake of limiting climate change, security of supply and public health reasons. A high potential of cost-effective energy-efficiency measures can be captured, and the Member States and EU should exploit this potential.

We would like to provide the Commission with the following comments and suggestions for its development of an Action Plan.

1. The level of detail varies considerably throughout the paper. It should be prevented that measures are selected just because they are known, and we would recommend the consideration of some lesser-known types of interventions as well, and a more integrated intervention strategy (see also the detailed answers to questions).
2. In spite of all the efforts on improving energy efficiency in the Member States and the EU over the last decades, there is not enough transparency in what works well and what does not. Knowledge on these issues should be shared. The Commission can play an important role in this, together with the IEA and EnR.
3. Several directives on energy efficiency have been adopted or will be adopted shortly. For each directive, strict implementation and enforcement is needed to reach the desired results. The Commission should also provide sufficient resources for energy efficiency. At the moment, this does not seem to be the case.
4. Within the 7th Framework Programme and CIP, there should be proper attention for energy efficiency R&D, demonstration and implementation projects.
5. The aviation sector should be targeted as well, a kerosene tax being the first step.
6. The background to some figures in the Green Paper, like a 20% reduction in energy use, is not clear. Attention is needed to improve the comparability and reliability of calculations, data and scenario's on energy efficiency. We would support a project between the EU and the Member States focusing on this issue.
7. The Green Paper pays little attention to the way the market is organised. For an effective energy efficiency policy, a thorough knowledge of the markets addressed is needed. For a thorough policy planning, it is important to envisage beforehand, in detail, what the effect of a certain policy instrument will be on that specific market, and if that is the desired result.

8. The focus in the Green Paper is almost exclusively on regulatory government intervention. This would be a remarkable change in EU policy compared to recent years, when the market was the dominant factor. While we welcome a renewed focus on the role of regulatory policy, continuity in policy is also needed, to be reliable and predictable. We would recommend to finding a balance between much needed regulatory measures, and a continued role of private sector initiatives.

Summarised response to the questions

A detailed response to the questions is included in this paper. In this section, we provide a summary overview, for quick reference.

Q 2. Energy efficiency in emission trading: It is difficult to promote EE in the EU-ETS. The ETS is designed to be a flexible mechanism, and promotion of a specific type of intervention (like energy efficiency) would probably undermine that principle.

Q 6. Special obligations for public authorities: The public sector could lead the demonstration and market introduction for various EE improvements (vehicles, buildings, appliances & equipment), especially when harmonised target levels are agreed.

Q 7. Energy efficiency funds: Funds can be important, but these should be considered within a wider analysis. Initiatives need to be tailored to the local context, and will probably need to include a combination of instruments (besides financial support).

Q 8. Increasing impact of EPBD: The energy savings potential in smaller buildings is very significant, and needs to be captured. Attention is needed for support for small building owners, and the efficiency and effective follow-up of building certification.

Q 9. Improving energy efficiency in rented accommodation: Leasing and other ESCO-type models can move this forward.

Q 10. Household appliances & equipment: Standards and labels are the way forward for this field, with sufficient attention and resources (especially within EU / EC work processes) for the expansion of covered products, and verification & enforcement.

Q 11. Energy efficient vehicles: Fuel economy standards (or negotiated agreements), and environmental zones in cities, are the preferred way forward, combined with efforts to increase consumer demand, and targeted R&D support for the vehicle industry.

Q 12. Public information campaigns: Campaigns can raise awareness, but don't change behaviour. More attention is needed for developing a body of knowledge on effective behavioural change mechanisms, and assisting local implementers with this expertise.

Q 14. Energy services: ESCO concepts can bring benefits, but market barriers hinder an autonomous development. Regulation would be needed, e.g. for a white certificates system. Careful consideration of the transparency and verifiability issues is needed.

Q 16. Encouraging industries: Covenants have been very effective in bringing forward industrial energy efficiency. These should be combined in an overall-strategy, encompassing various elements (e.g., innovation programmes, financing, standardisation)

Q 17. Balance between modes of transport: Very important, but primarily a national or regional responsibility. Europe could focus on developing new intermodality concepts, and developing a knowledge base for national, regional and local implementers.

Q 19. Transport sector measures: No single measure can bring about a transition in the transport sector. Important is to focus first on reducing car travel (spatial planning, alternative modes or transport), then to target energy efficiency, via mandatory standards.

Q 20. Public authority vehicle procurement: As with other EE products, the public sector can, and should lead the way. Essential are harmonised target levels for procurement, that can be applied in government purchases and procurement of public transport services.

Q 21. Infrastructure charging: The polluter should pay, also for the use or roads. In the end, all infrastructure use should be charged, differentiating location, time of use etc. A first step is charges for entering a city, a next step to charge for use of all main roads.

Q 22. Local and regional financing schemes: Experience is limited, but some successes have been achieved. The main lesson is that projects should be embedded in municipal or regional organisations. National support for that has proven to be very beneficial.

Q 24. Energy efficiency in developing countries: Developing countries have a large interest in European policies and practices. EU programmes to transfer these to other parts of the world could be very beneficial, to receiving countries and EU business alike.

Response to questions

Ad. 2 Emission trading system and energy efficiency

The question is whether the emission trading mechanism could be used to promote energy efficiency. In our opinion, this is only possible if and when energy efficiency improvements offer competitive alternatives for reducing emissions. If this is the case, then energy efficiency projects will be promoted by emission trading. However, there is no guarantee that other ways of reducing emissions, primarily fuel-switch, are not more attractive than energy efficiency.
This could lead to side-effects on energy efficiency of emission trading schemes - if an incentive is provided for fuel switching by ET schemes than energy efficiency could become secondary. In this case the benefits of emission reductions could be more attractive than the benefits of energy efficiency.

Keeping in mind these two factors, policy tools can be designed to combine energy efficiency measures and emission trading - a system which promotes (or allow it only) trading if energy efficiency is improved. This could not be such an easy task as integration of an economic instrument (ET aiming at least cost achievement of an overall target) with a technical standard (EE aiming at improving input/output factors) leads to inevitable clashes between regulatory concepts and would probably undermine the basics of the concept of emission trading.

A potential solution for this could be to state that within International Emissions Trading (most importantly in AAU trading, not to be confused with the EU-ETS) the EU-members will only consider investments where a real energy efficiency improvement is measurable, in addition to the emission reduction.
Within the EU-ETS these kinds of measures are difficult to implement, because flexibility for the participating industries is the basic principle for the EU-ETS.

For the new trading period, clarification on the used definitions within the EU will be necessary. Increase of the efficiency of the system and a more transparent process of allocation of emission rights and plans.

Ad. 6 Public authorities and special obligations

The Green Paper currently focuses primarily on the role that Public authorities could have in stimulating the market for efficient and clean vehicles. This role could be important, but it is certainly not the only field where public authority purchasing could have a positive impact. Other areas, especially in buildings, appliances and equipment, are equally important.

In the building stock, public authorities should without a doubt be an example for applying energy saving measures in their building stock.
There are two ways this example role can be effective and efficient:

1. Public buildings are often in the hands of one owner for a very long time, and one without profit requirements. This creates the possibility of having longer payback times than are typical in the commercial sector (usually 3-5 years), and the opportunity to implement energy saving measures that are not yet ready for commercialisation. Provided that the expected energy savings do pay back the additional investment during the technical life span of the measure, this allows for public authorities to operate as a first mover and demonstrate the effects of new technologies and procedures in real life.
2. The public building stock is usually a good cross-section of the national non-domestic building stock. This implies that this stock can serve as a 'testing and evaluation facility' technical and non-technical energy saving measures, as well as to test effects of legislation (by implementing these by agreement in the public sector), before these are implemented on a larger scale;

In the Netherlands, both ways have been tried, with success, in the building portfolio of the Rijksgebouwendienst (the state agency responsible for national government buildings). With energy efficiency programme (EER, energy efficiency programme state buildings), running from 1989 to 2000, energy saving options with a payback time up to 15 years were implemented in government buildings. Many of these were uncommon at the time of first implementation, but have become much more accepted since, also in other sectors of the economy. This early adoption has, naturally, also led to a significantly reduced energy demand (estimated 11% reduction over the baseline consumption). No regulations and legislation were necessary for this approach; an agreement within the government was sufficient.

Such role could also be envisaged for national governments in coming years, e.g. for testing additional measures related to the EPBD. Following the United States example (Presidential Executive Order, obliging all government institutions to procure low-standby power products if these are cost-effective and commercially available), public authorities could also speed-up the market development of new energy-efficient products (e.g., office equipment), especially if the requirements for such products are coordinated at the European level. Such approach would give manufacturers a clear performance target to aim for (a design for), and a market with enough size to allow for some investments in new, improved products. The European Commission itself could lead such

initiative, by engaging itself in such process, and developing procurement requirements that other governments could adopt for their own purchases.

In general, local governments are less likely to take a similar role in leading the market transformation of buildings. Political priorities at the local level, leading to tight budgets for energy efficiency and less capacity make it difficult for local authorities to lead the market development of new technologies. Leading by implementing established (but not widely adopted) best practices, however, is a possibility, as is demonstrated by local governments organised in the Dutch Klimaatverbond (climate union). These governments have (voluntarily) agreed to improve the energy quality of various public buildings, based on a selection of best-practice options prepared by the national government. To support implementation, the national government provided additional human capacities for these local governments, to overcome the barrier (of limited capacity) that was hindering local governments to adopt measures that they were willing to adopt in principle. But the most important factor for local governments to invest in energy efficiency is political priority.

Ad. 7 Energy efficiency funds at different levels

Energy efficiency funds have been instrumental in the transformation of the market for energy efficient buildings, products and industrial processes. Financial support has proven to be crucial in the first stages of market development, when transaction cost is (still) high, risks of a new product or technology are difficult to assess and measures may still be a bit expensive.

International energy efficiency funds can be very effective, when focusing on developing countries or economies in transition. Various experiences of international organisations (EBRD, World Bank, IFC, UNEP, and UNDP) demonstrate that in-country funding opportunities are often limited in these countries, and outside help (often in the form of national or regional funds) can have a significant impact on the uptake of energy efficiency.

At the European level, funding options for energy efficiency improvements are very limited. Energy efficiency can bring significant benefits to a country and to residents, and in some cases increased energy efficiency is believed to be a sine qua non for the liberalisation of energy markets (especially in some economies in transition, the transformation from a state-managed energy system to a market based system has stalled because residents would be unable to pay their energy bills if actual market prices would be charged; energy efficiency is a way to overcome this barrier). Funds would have to be tailored to the local situation, and would be locally managed. However, a European structure, comprising funds (e.g. structural / cohesion funds) and preferential loans (e.g. EIB loans) could be very promising. A European dimension might also raise the profile of this instrument, and signify a long-term commitment.

National funds can be very effective in promoting energy efficiency. Experience in the Netherlands proves that subsidies and fiscal incentives can have a dramatic impact on the sales of efficient appliances, leading to a very quick market transformation. These funds, however, need to be carefully managed to take full account not only of the national needs, but also of developments on the national markets. As was also the experience in the Netherlands, a fund which stimulates a product for too long, or not focused enough, risks funding free-rider behaviour more than the adoption of energy efficient products.

Experience with regional funds is that these can be very effective, as is shown by the experience of the Dutch utilities in the 1990s. These initiated regional preferential loan funds, specifically targeting SMEs, which were very successful. The setback of regional funds, however, is that it creates a rather uneven playing field, for SMEs, and also for installers and other suppliers of efficient products and services. It also reduces the potential impact of (national) media attention and other means of communication. In the Netherlands, these effects have contributed to the decision to switch from regional (utility-managed) funds to a national (state-managed) one. A preferential situation is probably if local or regional initiatives can make use of national (or European) funds, promoting measures that are coordinated at the national or European scale, but in an

approach tailored to the local context. Such Community Approaches could be very effective, and might need to be able to draw financial support (for energy efficient products or services) from larger-scale funds.

Regarding funds for industrial energy efficiency, we would like to note that national and European law doesn't allow for financial support of investments with very short payback periods. Under Dutch law, all companies (that require an environmental permit for their operations) are obliged to implement all energy saving investments that have a payback period of five years or less. Enforcement however, is a problem. Similar rules may apply in other countries as well. It would not be logical to support energy efficiency investments if these already have rather short payback periods (like to indicated 2 years) or if these are already required by law. Funds (e.g., funds or preferential loan schemes) may be needed, however, for new practices and technologies, and for investments with longer payback times.

Ad. 8. Effectiveness of the EPBD

The impact of the Energy Performance in Buildings Directive (EPBD) is attributed to two, separate aspects: the requirement to upgrade buildings (above 1000 m^2) when renovating these, and the requirement to certify (almost all) buildings before sale, rent or lease. These aspects will be discussed in that order.

Calculations indeed show that in most buildings, the potential for cost-effective energy efficiency / energy conservation improvements is significant. Capturing these benefits (on cost, for the building owner, and on carbon emissions, for society) is essential if we want to progress towards a sustainable energy future. The study that is referred to indeed shows that the potential is as significant in smaller buildings and is even larger for single family homes. In the Netherlands the energy performance standard (EPN) already applies to buildings smaller than 1000 m^2, both for new buildings and (large scale) renovation. As such we have already implemented this extension of the EPBD and recognise the energy saving potential this extension creates.

A first and most important step in the extension of the EPBD should be to generate more detailed information about the energy saving potentials at building level, in order to narrow down the scope of buildings rather than broaden it: trying to find the cross section of buildings that has the highest potential at the lowest cost. Focusing on this cross section will in the end lead to the greatest effectiveness of the EPBD. Monitoring activities to generate information about energy saving potentials could be organised at EU-level.
A second step could be to include other (smaller) building categories too in the approach of the EPBD. However, proper care should be given to the fact that smaller buildings are often owner-occupied, and owners might not have the investment capacity and technical expertise that (often professional) owners of large buildings possess.
European funds (see also question 7) could be an important aspect in this area. In this respect, we also would like to draw attention for the Final Communiqué of the 16th meeting of the Ministers of Housing of the Member States of the European Union, which calls for European funds to be made available for urban renewal and specifically energy efficiency improvements.

The requirement to certify a building before sale, rent or lease has very different characteristics. Studies indicate, and it is obvious that the impact of the EPBD requirement as such is probably not very substantial. Like labelling of appliances, the certification must be supported by other measures in order to achieve savings. The certification does lead to a significant administrative burden and cost for building owners, and priority should be given to increase the efficiency of the certification process. Options could be analysed to generate the same level of (certified) information at lower cost to the home owner, and to include these in the requirements of the directive.

Further, it is most important to create instruments that assist home-owners to make use of the energy efficiency advice that they are given. Efforts should be made to stimulate home-owners to upgrade their house independent of a potential sale or rent, for the

benefit of having an efficient and comfortable home as such. Such efforts could include technical and financial support, and experiments with new business models and public-private partnerships for the retrofitting of houses (i.e. white certificates, see also question 14) could be considered as part of an EU programme.

Ad. 9 Rented accommodation and energy efficiency

The answer to the problem of investors being different persons than the beneficiaries of energy saving measures lies in financial and procedural constructions. There are a lot of constructions (leasing for instance) available that can fill in this gap. For instance: for energy efficient lighting there is a (Belgian) company that is invests in energy efficient lighting at a customers' premises and leases the lighting as a service to customers at relative low costs. The company installs energy efficient lighting in the customers' building, and pays the investment costs. The customer pays back the investment costs in monthly terms. Because the operation costs for lighting are less than before, this monthly investment payment does not feel as an extra burden for the customer.
At the moment this is still a niche market. To move these innovative financing schemes from niche market to mainstream, governments should take the following actions.

National governments should take two kinds of actions in this field:

1. accept (or withdraw current) legislation to allow and stimulate these financial constructions
2. stimulate the use of financial constructions through example projects

On a European level actions could be taken to enlarge the market for providers of lease contracts etcetera, by harmonizing conditions.

Ad. 10 Performance of energy-consuming products for household use

In general, it should be noted that regulatory policies for household appliances are a sole European responsibility. Until recently, Commission initiatives in this area have been limited and progress was rather slow. For countries with an ambitious agenda in this arena, that has been rather disadvantageous. It is encouraging to see that the Commission has recently revived its activity in this area, for example with the 'Ecodesign' directive and plans for a new framework directive on labelling. We would like to stress that, especially in this area, the Commission keeps good track of its own progress and makes sufficient resources available for furthering its own plans.

The Labelling framework Directive (92/75) and the framework Directive on Eco-design, together with R&D programs and voluntary agreements in principle provide a complete framework to improve energy efficiency for domestic appliances (white goods, consumer electronics and office equipment).

The impact of legislation on the energy performance of domestic appliances can be reinforced by:

- improving the work process at the EU-level (a minimum of three well-planned meetings per year, a better planning and documentation of the process and outputs);
- improving the coverage of the energy label (including Internet sales), and creating a public database with product energy performance data;
- extending the number of products labelled; especially an energy label for televisions is urgently needed;
- urgent revisions of some of the energy labels, and the underlying test standards, for products that have shown a significant market transformation in recent years;
- a better monitoring of the impacts of energy labels on the market, making this information publicly available;
- Much more attention for European cooperation in verification and enforcement activities. Although these are a national competence, much could be won be simple measures like requiring a yearly report by all member states on V&E activities. Later on, harmonisation of verification procedures could be considered.

The best ways to encourage constant improvement of the energy performance of domestic and other appliances is via a market transformation strategy: a combination of minimum energy performance standards (MEPS), energy labels and R&D subsidies, with a regular update of the standards and the labels. Voluntary agreement could be used instead of minimum efficiency standards, provided the partners in the agreement cover a sufficient share of the market (80% or above). MEPS are particularly needed to assure that the worst performing products are removed from the market, and that a reasonable performance level is achieved for products for which labelling is not appropriate (e.g., standby power consumption). Labelling is particularly needed for products that have a notable impact on household energy consumption and for which products on the market vary significantly in their energy performance. Only developing sufficiently ambitious

MEPS and challenging label class borders, and regularly updating these, makes sure that industry will maintain a continued focus on energy efficient product design.

To kick-start research and production into a next generation of energy-efficient products, it must be recognised that research and production of (the next generation of) energy efficient products will only take place if there is a market for these products. The previously mentioned regulatory instruments (labelling, minimum energy performance standards) should be used to create such market. This implies that targets for MEPS and labels need to have a sufficient lead time, and that research funding needs to consider which aspects of product design respond well to these regulatory instruments.

Various other measures could be taken at the international, European, national and regional level, to reinforce the impact of legislation on the energy-performance of household appliances. These are listed in Annex 1.

Ad. 11 Promote energy efficiency in vehicle production

In general there are four ways to further stimulate the industry to produce energy efficient vehicles:

- legislation by the EU, national, regional or local governments
- voluntary agreements with the industry
- creating a demand for energy efficient cars
- subsidies for R&D

As with all interventions, it is most effective to have a balanced combination of instruments to promote energy efficiency in vehicle production.

Legislation

Energy efficiency regulations can be an effective way to promote the production of fuel-efficient vehicles. Regulations, combined with strict enforcement, guarantee that all marketed vehicles comply with a set level of energy efficiency.

The level of energy efficiency mentioned in the regulation should be increased every few years, to stimulate innovation in the vehicle industry. The new level should be published at least five to ten years before it comes into force, so that the vehicle industry can anticipate on the new level.

The experience of the State of California proves that such approach can work in the vehicle industry. California's low-emission vehicle regulations require auto makers to sell increasing numbers of vehicles with much lower emissions, including a sales fraction of zero emission vehicles (ZEVs). All auto manufacturers must comply with rules regarding transitional, low and ultra-low emission vehicles. The original regulations mandate that 2 percent of each of the largest manufacturer's light duty sales in California must be ZEVs by 1998, increasing to 10 percent by 2003. Based on this mandate, California Energy Commission staff analysis indicates that the number of light duty ZEVs sold in California in 2003 may be approximately 132,000.

At least two separate types of regulation can be distinguished:

- EU-legislation on maximum carbon emissions per kilometre. The EU already has implemented the EURO-standards for vehicles. By regularly reducing the target values, the industry could be pushed towards producing cars that are more fuel-efficient. European subsidies for R&D could be used to support the transition towards manufacturing more efficient vehicles.
- For air quality and public health reasons, some cities already exclude specific types of (freight) vehicles from entering densely populated areas. In Amsterdam, for example, local regulations allow only trucks complying with the latest EURO-standard within the city ('Milieuzone' –environmental zone). For air quality reasons, other cities (Rotterdam, Leiden, Tilburg, others) are implementing similar policies as well. It should be noted that the EURO-standard targets both air quality and carbon emission issues. A European framework for such policies would enable cities to implement such measures more easily.

Voluntary agreements

Instead of implementing mandatory standards, Europe could negotiate voluntary agreements with industry about the maximum allowed emissions from cars. This has proven to be a viable alternative in other sectors (e.g., industry, appliance policies [white goods]). Voluntary agreements could also be a first step towards a mandatory policy, if that is too complicated to implement now. Voluntary agreements however, should contain result commitments (a certain level of energy efficiency) and should not be limited to effort commitments. And a majority of the market (app. 80%) should be involved in the voluntary agreements.

Creating demand

- Consumer interest in purchasing more fuel efficient cars can be stimulated by price measures. It should also be noted that a purchase decision is not just the selection of the cheapest car; many other aspects are important, especially with an 'emotionally charged' product like a car. This reduces the impact of price measures, and of tools to stimulate consumers to compare running cost when making a purchase.
- Marketing or product placement of fuel efficient cars can also be very effective, especially since a car is an 'emotionally charged' product. High oil prices give all the more possibilities for marketing fuel efficient cars. This, however, is more a task for industry than for the government.
- Subsidies or preferential VAT-rates for efficient cars will provide a benefit for consumers, and may be used to raise the profile of efficient cars with consumers selecting one. These incentives, when used to allow a price decrease of efficient cars, might stimulate manufacturers to develop and more actively market these products, thus stimulating consumer demand. This process has probably happened with some household appliances, at times when the Netherlands provided significant subsidies for A-labelled products, and the resulting market transformation has been impressive.
- The information provision about energy efficiency to consumers, and professional car owners (like fleet managers) could be improved. Research (STEPS-project, 2004) shows that end-users have limited knowledge of the latest developments in vehicle energy efficiency, which limits their potential to make a rational choice. Besides giving information, consumers and professional car owners should also be given information on where to buy energy efficient cars, how they could market this towards their customers, etc.

R&D funding for energy efficiency in vehicles

- When tightening vehicle fuel consumption and emission standards, industry has to make a (sometimes rapid) transition to new technology. R&D subsidies can help to take this step, and it is recommended to pay more attention to vehicle energy efficiency in the regular EU R&D programmes. Our impression is that energy-specific research, targeting efficient and clean road transport, should be given more attention, next to the other issues.

Ad. 12 Public information campaigns

Public information campaigns have been used in member states to raise awareness on energy-efficiency, and have, in some cases, been successful in doing so. Public awareness campaigns, however, are not considered to be effective in changing behaviour (of consumers or other end-users. Public information campaigns can be an effective support for other policy instruments (like legislation or financial incentives or training), but a campaign on its own will not bring about behavioural change.

When discussing awareness raising campaigns, careful attention should be given to the 'sender' and the characteristics of the 'receiver'. In general, if the information is more specific, and the target group is more focussed and addressed specifically, the likelier it is that information will reach the consumer (or other audience).

Research into the effectiveness of behavioural change strategies [1] shows the important elements in designing interventions. Concerning effectiveness, we can distinguish between the 'reach' of the strategy (percentage of the target group that has been reached by the intervention) and the 'effect' (the percentage of the target group targeted by the intervention that are likely to change their behaviour as a result). In the table below, the different strategies are scored on their reach, effect and impact (reach multiplied by effect).

Table Effectiveness of intervention strategies

Type of strategy	Costs per person (in Euro)	Reach	Effect	Impact
No intervention (autonomous change)	-	33%	3%	1%
Folders, posters	0.5	80%	4%	3.2%
Self-help guide	6.5	80%	10%	8%
Tailored information (by internet)	18.0	80%	20%	16%
Individual advice	182.0	50%	28%	14%

Source: The Guide to Change, 2001. Aeneas, the Netherlands.

From the table we can see that the more tailored the intervention strategy is, the higher the impact will be.
When designing intervention strategies:

1. It is very important to target intervention strategies to the different segments of the target group you want to reach.
2. Interventions should be as focussed as possible, targeting a very specific and well-described behavioural change (i.e. an increase of the use of light saving bulbs in households by 20% in 2 years)
3. Information should come from a reliable entity. This can be a government organisation, but also a consumers association etc...

[1] The Guide to Change Energy Related Behaviour, 2001. Aeneas Technical Publishers, The Netherlands. This report is the result of a SAVE-study condusted by a consortium of Dutch, Irish and Greek experts.

4. Information on how to change behaviour should be given the moment the consumer is interested in the subject ('the window of opportunity'), i.e. information on isolation of the house should be available at the do-it-yourself shop, or from the construction company. Information on subsidies for renovation at banks or real estate agents, etc.

Following the recommendations of this European study, we would consider that on the international and European level, the most important issue to learn from experiences in other countries and continents, and to build a body of knowledge of successful intervention strategies for behavioural change. The results show that interventions can have significant impacts, and much more experience is needed on the cost-effective delivery of these interventions, as well as on tailoring these to the various target groups. In this area, experts in Europe can learn a lot from each other, within the energy efficiency community on probably also from other sectors, and the European Commission would be ideally placed to facilitate such exchange and make sure that this is kept high on the agenda. In 2005, an EnR (network of European Energy Agencies) Working Group on Behavioural Change issues was set up. The Commission is invited to participate in this working group, and help keeping the subject high on the agenda.

Actual implementation work, however, is probably better off in the hands of national, regional of local policy makers, who can tailor an intervention to the target group, develop effective links between communicative and other instruments, and have much closer ties to the local community. Especially regional and local experts, however, do not have the means to analyse and experiment with various and intervention strategies.

We would prefer that the European resources in this area are focused on enabling public outreach activities of the many national, regional and local policy makers and experts, by providing world-class knowledge and exchange of expertise, rather than spending budget on EU-organised campaigns, such as The Sustainable Energy Europe campaign. Based on our experience, knowledge of consumers and other target groups, and literature, we expect this campaign to have a very limited impact on the awareness for energy issues with the general public.

Ad. 14 Energy services

A system of white certificates with an obligation for energy companies to realize a certain amount of savings is one way to trigger energy companies to spend more effort in energy saving activities, or - said otherwise - to behave more like energy *service* companies then like energy *selling* companies. Furthermore, white certificates offer flexibility because also other market parties can earn certificates by realizing energy savings and sell these certificates to energy companies.
As indicated in the proposal for the Energy Services Directive several barriers prohibit this behaviour in the current market situation. A voluntary code or agreement does not seem adequate, and is therefore not necessary.

It should be noted, though, that the ESCO concept may encounter many practical difficulties, especially in the residential and small-commercial sector. Research shows that the impact of similar energy conservation interventions differs a lot between households. For example: the energy demand of households in identical, well-insulated new homes varied very significantly; the highest demand was up to 5 times as much as the lowest, even for heating demand. It is also known that household energy demand can vary drastically over the years, unrelated to energy efficiency, but probably kinked to changes in household size etc.
A careful consideration is needed on the amount of energy saving that is attributed to the energy service company that implements measures, and to make this a transparent en reliable mechanism.

Ad. 16 Encouraging industry

The suggestions mentioned below are based on the vast experience that the Netherlands has gathered with the Long Term Agreements (LTA). Participants are the government, industry and service sectors. LTA is based on voluntary agreements between these actors to improve energy efficiency in industrial and service sectors.
In the Netherlands, the second LTA (2001 to 2012) on energy efficiency in industry has been successfully in operation for 4 years. It is the successor of the first LTA (1992-2000) which resulted in 22.3% efficiency improvement in 2000 (compared to 1989).
In the second LTA up to now an average of 2, 5% energy efficiency improvement per year has been reached by the participants.
While the first LTA mainly focused on process efficiency; the second LTA has shifted towards energy efficiency over the product life cycle and a more integrated energy and environmental policy.

What more could and should be done:

1. In addition to innovation programs, promote the accelerated dissemination of knowledge from the early adopters to the early majority of the SME's. Innovation should give an additional impulse to energy savings.
2. Accelerated dissemination of innovations can be stimulated between countries (next to companies) at EU level. Leading countries can counsel other countries
3. Financing, seed facility and venture capital. More easily accessible financing options for energy saving investments.
4. Technology Procurement, improve efficient machines in industry. Technology procurement is focussed on the energy aspects of equipment that is supplied by contactors. Studies performed in the Motor Challenge Programme (EIE project), show that a savings potential of 34% is achievable when the energy aspect is taken in with the procurement of new or redesign of existing equipment.
5. Standardization of equipment on the subject of energy efficiency. Through the Ecodesign guideline, minimum requirements can be prescribed on the energy efficiency of equipment on the European market. Through the same guideline e.g. a maximum standby usage of equipment could be prescribed.
6. White certificates, directed to consumers with the energy companies as contact point. This could be an additional way for smaller companies to finance efficiency measures.
7. Stimulating so called Energy Service Companies (ESCO's); larger companies can outsource their energy facility and maintenance.
8. Promote the development of energy efficient products within enterprises. European legislation is moving towards integrated product policy. Within the Long Term Agreements (LTA) program, results are promising on the potential savings that can be achieved through this life cycle approach. To realize that companies cooperate on energy efficient product development that are also supplier-client-customer related, asks for a stimulating approach.
9. Public procurement, with the government as sustainable consumer, the development of energy efficient products can be boosted.

Ad. 17 Change of transport modalities

A better balance of transport modalities could bring significant benefits to society; both on energy demand and on other transport-related issues (air quality, congestion, liveability in general). Road transport is the predominant modality in our society; other modalities have a much lesser role in the transportation of people and freight. A long-term perspective on a more balanced use of transport modalities would therefore have to begin with an analysis of spatial planning, and the transport connections that can be made between locations. Too often, locations are planned to have easy car access, and other modalities need to be added later on, with much difficulty. Integrated planning tools have been designed as part of the (FP5) project 'Ecocity', by SenterNovem and others.

Better traffic management and inducing a shift to other modalities require an integrated approach, encompassing many aspects. A better navigation system, as indicated, would be one of these, but other elements are probably equally or more important. When discussing intermodality, we would like to separate personal and freight transport, and to distinguish between metropolitan areas and larger cities on the one hand side, and small towns and rural areas on the other hand.

Personal transport
In high-density areas, public transport could be a viable alternative to car traffic, for the transport of people inside and into cities. The number of passengers allows for the construction of high-capacity infrastructures, ranging from trains and trams, to bus lanes. In such situation, public transport can bring important energy and other benefits, by reducing car transportation. It is important to improve the market share of public transport in cities, for example by improving the quality of a network by adding extra lines, or by giving preferential access to inner cities, via dedicated bus lanes. Reducing parking space in cities could also be a very effective way of inducing a modal shift.

In lesser-density areas, it is very difficult to develop a cost-effective public transport network. This limits the possibility to promote a shift away from car traffic. New solutions may be needed for these areas. The EU-funded project 'Niches' conducts research on this topic.

For short distance international transport, high-speed passenger trains can be an alternative to air planes. Care should be given, however, to the energy consumption per passenger, as high-speed trains may have a much higher energy demand than regular trains.

Freight transport
Alternatives for road transport are often unavailable. A first step, therefore, would be to add alternative (environmentally beneficial) modes of transport to the existing infrastructure, preferably at points where several modalities can be combined and freight can easily be moved from one modality to another. An example of such points is the container terminal in Rotterdam harbour, which can accommodate ships, trains and

trucks. A full alternative transport system, however, requires 'hardware' (infrastructure), 'software' (road, rail or water vehicles), and 'orgware' (logistics).
Transport cost are an important criterion for the selection of a transport mode. These costs can be influenced by policy, e.g. by taxation of undesired modes, and the subsidisation of desired ones. Other (des)incentives can also be applied, e.g. a reduced speed limit for vehicles in or around high-density urban areas and limiting access to cities for cars.

European dimension
The vast majority of transport takes place within countries, and even within cities and regions, and the share of international transport in the total is very limited. Promoting the use of other transport modalities, which is closely linked to the specific situation in a region, can thus only be implemented on the national or regional scale, and the role for European policy in this field is probably limited. What would be important on the European level is to create and experiment with new intermodality concepts, to exchange experience and to develop a knowledge base on balancing transport modalities. This should be accompanied by an effective dissemination infrastructure, to make sure that the relevant information reaches all involved (or future involved) parties, during formal education but also in daily practice.

Ad. 19 Which measures to adopt in the transport sector?

In general, no single solution can bring about the necessary changes in the transport sector. This appears to be especially true for 'technology fixes'. Although important, these need to fit into an integrated approach, including many more aspects. In this respect, we would also like to refer to the suggestions to question 12, regarding public outreach and the planning of behavioural change.

To better analyse the transport sector, and the approaches needed, SenterNovem has developed a 'layered model' of the transport system, comprising of 6 levels. Together, these range from the socio-economic system to vehicle components. Although it may nor be practical to include all layers in (the analysis of) all interventions, we have learned that it is important to review an intervention in relation to the other system components at higher and lower levels.

----Demand ---------->	<---------- Supply ----	SYSTEM	Aspects
		Socio-economic system	Political and economic order, cultural / societal trends (individualisation, ageing, etc)
		Spatial system	Structuring of functions: living, working, recreation etc
		Mobility System	Total of all travels
		Transport system	Interaction of the subsystems, intermodal transport, with 'telematics' (ICT) as intermediary (connector)
		Vehicle System	Separate systems: car, train, bike, plane, …
		Component system	Vehicle components, e.g. engines, weight and shape

Options to be considered to curb the growing energy demand for transport would need to be multi-dimensional (or multi-level). Some considerations are:

- It is probably better to target car use first, and then the efficiency of cars. Spatial planning practices should be reviewed for options to promote urban development at locations which are easier to connect to public transport networks. Also, spatial planning of neighbourhood should start with planning from the pedestrian, then the cyclist, public transport and last, the car. This can reduce short-distance travels in neighbourhoods by car considerably. Spatial planning should also include safety of slow traffic like pedestrians and cyclists;
- A change in the relative cost of car travel versus public transport could be initiated, to provide further stimulus for non-car travel;
- The energy efficiency of cars should be targeted. Legislation (standards) will have the largest impact, but care should be taken to make sure that industry can meet

the demands. R&D subsidies may be needed to reduce the lead time for industry to meet new standards;
- Components like tyres could be tackled.
- Energy efficient driving of cars should be promoted. In the Netherlands, there is good experience with a concept called Het Nieuwe Rijden (The New Driving), which stimulates car drivers to shift early to a higher gear, check tyre pressure every month and anticipate. This concept has been introduced in the driving curriculum, and can save up to 10% of fuel use.
- Promoting teleworking for one or more days of the working week can reduce commuting traffic. This does require a different way of working and organising work, and measures to promote this should be taken together with employers' organisations.

We cannot recommend one single measure as the best option. The issue is a complex one, and an integrated approach is needed. This could include tax or other financial incentives for energy efficient cars, road pricing, congestion charges, limiting parking facilities or increasing parking charges, and restricted access (for all or some vehicles) to high-density areas. A careful consideration of the potential impact of measures, on their own or in a combined approach, is needed, also considering that effect of measures might be to redistribute car travel (to other times, locations etc), more than to reduce it.

As with promoting transport intermodality (see question 17), it is important to tailor interventions to the local context. The European dimension, therefore, is probably limited to measures that can be implemented at the European level (e.g., related to the production of vehicles).

Ad. 20 Public authorities and obligations to buy energy efficient vehicles

Public authorities can have an important lead role in the introduction and market development of many new products, including energy efficient vehicles. More information to this issue is mentioned in response to question 6.

As governments are often large fleet owners, with sufficient expertise, public procurement can also be applied to energy efficient vehicles. On the European level, it could be agreed that public authorities should reach for a specific energy efficiency level (differentiated per vehicle type) for all their vehicle purchases, or that a share of their purchases should be of a very efficient level. This can be either agreed at the European or the national level.

Most important is to agree, on a European scale, on target levels for the procurement of efficient vehicles. That would allow manufacturers to develop and market products in a unified approach throughout Europe, to all public authorities that wish to engage in such policy. The decision whether or not to participate, which has important budget consequences, could then be left to the relevant authority, although sufficient attention should be given to communication the benefits of efficient vehicles (e.g., reduced running cost, lower emissions) to all involved parties.

Such scheme could be extended to the services that public authorities procure, and specifically public transport services. When offering concessions for the operation of public transport lines or networks, care should be taken to include vehicle performance and emission targets. The European Commission could exchange best practices in this area, and perhaps promote such approach via its transport policy as well. Harmonisation of target levels might be very relevant in such approach, to prevent the introduction of barriers to market entry for such services.

Ad. 21 Infrastructure charging

The logical end-phase for infrastructure charging would be to charge for the whole road network, at all times. This charge, however, would need to differentiate according to time of day, duration, location, vehicle type, direction etc. Such charge could be used to add cost for trips that are more environmentally harming (e.g., short trips within cities, or when good public transport alternatives are available), as a disincentive for car travel in such cases. A first analysis was conducted, by SenterNovem, into the option to also charge a 'Verblijfsheffing' (residence charge), a charge for being at a location, whether the car is being used or parked.

Current charges, like the congestion charge in London, are a good initiative, but still a long way towards full road pricing. Currently, within the charging zone, cars can drive as much as they wish, without the need of paying more: 'once you've entered the zone, you can drive as much as you like'.

A next step could be to charge for the use of roads leading into major cities all of the time, and, later on, to charge for the use of all main roads. The income raised by such charge could be used to lower fixed taxes on cars, or to lower non-transport taxes and invest in public transport modalities.

In principle, the polluter should pay, also for travel. This implies that the cost of pollution, if this can be calculated, should be born by the car traveller, as well as by users of other transport modes, proportionally. Congestion charges are primarily intended to reduce congestion, not necessarily to transfer the cost of not being able to reach a destination at a normal speed to someone else, who is also stuck in traffic. Charging the cost of accidents to the 'cause' is probably a step too far. This might add a very significant charge for what is, after all, non-intended and incidental. Variable insurance cost, as is already current practice, is probably a more appropriate measure for those aspects.

Ad. 22 Local and regional efficiency project financing schemes

In the Netherlands, there is limited experience with local or regional energy efficiency project financing schemes. Most financing schemes are at a national level.
There is however, a very successful example of a regional energy efficiency (and renewable energy) project financing scheme.
Energie 2050 (Energy 2050) is an organisation within the regional authority of the province Noord-Brabant. This organisation does not finance projects, but finances manpower to work within the regional or local authorities on energy efficiency and renewable energy issues. The success of this approach lies in the fact that expertise on energy is concentrated in one or more persons, who work within the local administration.

A very important way of activating provinces and municipalities in the Netherlands is a national subsidy called BANS climate covenant. Municipalities and provinces can apply for this subsidy when they have set up an extensive climate policy and implementation program. The subsidy is meant for compensating the amount of labour for the implementation of the climate policy. Through this subsidy some 250 municipalities and all provinces have set up and are executing local climate policy. One can say that climate change is on the local agendas because of this subsidy and action is being taken.

There are various regions and municipalities that have their own subsidy programs for different kinds of renewable energy technology. The amounts given are usually not very substantial, but just meant to nudge a project in the right direction.

It is important to make sure that projects on energy efficiency and renewable energy are well-embedded in the municipal or regional organisation. All stakeholders within and outside these organisations have to be involved in setting up the climate/energy policy as well as the implementation program. This way, the success rate of a policy, and the commitment towards a good implementation of it, will be maximised.

In agreement with the proposals in the Green Paper, we conclude that only a combination of measures at the various levels (EU, Member States, regions, local level, and industry) will allow optimal improvement of energy efficiency.

Ad. 24 Developing countries and energy efficiency

Many developing countries have shown a large interest in recent years in European energy efficiency policies, practices and technologies. The European system is recognised as an example of good practice, and many countries want to adopt elements of this. A very clear example of this is the EU Appliance labelling, which is becoming a de facto standard in the world, as is shown be the examples in annex 2. Other European regulations have also drawn significant attention from other countries:

- The Russian federation has recently adopted building energy codes, modelled on EU directives (including the recent EPBD) and the German EnEV 2002;
- China has invited Dutch expertise to provide guidance in the development of sustainable building practices;

All along the EU borders, and beyond, countries are very interested in learning from the European experience. Member states, and international organisations have assisted in this call, but a European framework for such support appears to be missing, so far. For comparison: In the Unites States, several policies, programmes and funds actively market the US approach to energy efficiency, and with a lot of impact in many countries. Without suggesting that there should be a competition between the US and Europe (instead, cooperation is the preferred modality), it is remarkable to see that so many countries have shown an interest in European policy and practices, including the European Norms, but this is given little attention in the EU external relations and development policy. Much more could be achieved if this was given more attention, with large benefits for the receiving countries (who could benefit from access to high-level European expertise), for the European industry (who could benefit from harmonised markets, worldwide), and for the environment.

Developing economies, and especially some quickly developing countries, increasingly run into power and fuel shortages. Current increases in world energy prices have put further pressure on these vulnerable economies. Increased energy efficiency and deployment of renewable energy is, particularly in those cases, essential to facilitate much-needed economic development, whilst limiting the negative environmental impact this can have. This, of course, is not a new issue, but a link with 'exporting' policies and practices has so far not been made. The Benefits, and the cost-effectiveness, of such approach could be significant. An approach would have to focus on the specific issues in other countries, like the high demand for cooling in buildings, and could also consider the transfer of efficient (or renewable energy) technology.

The initiation of support programmes, similar to the Phare and Taiex programmes for the (then) candidate countries, now for countries within the European market influence, but outside the EU borders, could be a very useful addition to the EU's efforts in this area. We would recommend that the EU considers such instruments, with a focus on assisting non-candidate countries in adopting EU energy efficiency regulations, practices and related standards.

Annex 1: Measures to reinforce the impact of legislation on the energy-performance of household appliances (annex to question 10).

Issue	**Result**	**Level**				**Type of measure**			
		Inter-national	*EU*	*nation-al*	*regio-nal*	*recommen-dation*	*Voluntary*	*binding objective*	*legislation*
10.1 Reinforcing impact of legislation (labelling, eco-design)									
a) improving working process	Systematic and planned revision /implementation of labelling directives /eco-design measures		X			Internal EC			
b) increasing effectiveness	Market transparancy is improved								Require energylabel data to be made availab to a public database.
	Number of products covered is increased								Label for TVs
	Directives are timely revised		X						Revision of framework directive
c) improving monitoring, compliance and verification	Monitoring data is public available; compliance and verification results are shared between Member States		X	X		Monitoring			
10.2 Encourage production and consumption of energy efficient products	Increasing market share of energy efficient products		X	X		Promotion of new/revised labels.			Minimum efficiency standards; revised labels
14. Stimulating energy services by energy companies.	Energy companies offer energy services to realise energy savings with end users.		X?	X					System of tradable whit certificates