Sustainable Energy Consumption

European Conference under the Marrakech-Process on Sustainable Consumption and Production (SCP)
Berlin, 13 & 14 December 2005




Meeting Report and Co-Chairs´ Summary

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Umwelt Bundes Amt
Für Mensch und Umwelt

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2nd European Conference on 'Sustainable Energy Consumption' under the Marrakech-Process on Sustainable Consumption and Production (SCP)

Meeting Report and Co-chairs' Summary

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Meeting Report and Co-chairs' Summary

Co-chairs' Summary

1. The 2nd European Conference on 'Sustainable Energy Consumption' under the Marrakech Process on Sustainable Consumption and Production (SCP) was held in Berlin, Germany, 13-14 December 2005. This informal expert meeting was jointly organised by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, the German Federal Environmental Agency, the European Commission, and the United Nations Environment Programme. It was hosted by the Federal Government of Germany. The Government of Switzerland also provided financial support.

2. Over 70 experts representing governments, business, consumer organisations, environmental organisations, and research institutes from 17 countries participated in the meeting.

3. The meeting was organised in response to the call of the World Summit on Sustainable Development (WSSD) Plan of Implementation for the development of a 10-year framework of Programmes on Sustainable Consumption and Production, in support of national and regional initiatives. All countries were requested to take action, with developed countries taking the lead. Progress made in developing and promoting the framework, also referred to as the "Marrakech-Process", will be reviewed in the 2010/2011 sessions of the UN Commission on Sustainable Development (CSD).

4. The meeting in Berlin had a specific focus on sustainable energy consumption. It addressed issues which relate to the production and the use of energy-using products, including the role of public procurement. The areas transport, energy generation, and energy distribution were not topic of the meeting.

5. The meeting was chaired by Ms. Susanne Lottermoser, Deputy Director-General of the German Federal Ministry for the Environment and Mr. Timo Mäkelä, Director, Sustainable Development and Integration, DG Environment, the European Commission.

6. The objectives of the meeting were to:

- contribute to the implementation of the Johannesburg commitments on sustainable consumption and production;
- contribute to the CSD 2006/07 work cycle where energy for sustainable development is one of the key topics, including to the Marrakech Task Forces' work plan;
- position SCP as one of the most important cross-cutting issues through all the CSD work cycles;
- contribute to the further development of policies and activities at the European level, including the implementation of the Framework Directive for setting eco-design requirements for Energy-using Products (EuP Directive), and the European Sustainable Development Strategy and Environmental Technology Action Plan;.
- demonstrate the technical and economic potential for making energy consumption (and production) more sustainable;

- share information on ongoing activities and identify priority areas as well as potential gaps in policies and tools;
- identify key areas and corresponding measures for the implementation of sustainable consumption and production (SCP), and
- identify the role of each stakeholder group in the implementation processes.

7. The opening statements pointed to the large quantity of private consumption in developed countries and its contribution to greenhouse gas emissions. The German government, together with UNEP and the European Commission, chose to focus on energy efficiency of products as a key to global sustainable development. The new EuP Framework-Directive was considered an essential instrument for developing energy efficient products. The conference was seen as an important opportunity to develop proposals for implementation measures for the Directive and contribute to concrete action suggestions for the current cycle of the Commission on Sustainable Development, which will focus on the topic of energy in 2006 and 2007. Similarly, UNEP is now focussing on supporting the development and implementation of concrete demonstration projects with the most active countries in each region, to provide replicable best practice examples. Additionally, participants were reminded of the global dimensions of the conference topic: the relevance of energy efficiency to global climate change and the need to overcome current global inequality of access to energy. A paradigm shift in consumer behaviour, corresponding new policies regarding energy efficiency and renewable energies, and most of all immediate action were called for to promote and realise sustainable energy use of products.

8. During the plenary sessions' key note addresses introduced several existing initiatives, in particular at the EU level. The huge potential for environmental improvement through energy efficiency measures was emphasised. As a consequence participants saw the need to highlight priorities and develop flagships. The global perspective of energy efficiency and energy poverty as a phenomenon prevalent in developing and developed countries was stressed. In this context, the positive impact of small and inexpensive measures was highlighted (e.g. the impact of smart meters) as well as the influence of green public procurement, both in numbers (the amount of energy saving through efficient light bulbs) as well as positive example to effect the much needed change in consumer behaviour.
Concrete actions proposed include inter alia:

- Promote performance targets for energy efficiency of products (e.g. Top-Runner-Approach) using instruments such as the EuP Framework-Directive;
- Conduct a product panel on light bulbs at the European level to improve energy efficiency.

9. <u>Working Group 1: Energy Savings in Households – A utopia?</u>

This working group discussed the consumption of energy-using products. The participants of Working Group 1 were of the opinion that huge energy savings in the household could be achieved by applying the existing stock of energy efficient technologies. The main concern should therefore be on appropriate dissemination of information targeting the household, as knowledge of energy efficient consumption is poor and technology for efficient energy use is

often poorly employed. A special focus should also be given to energy savings through efficient heating, cooling and appropriate insulation of buildings.

Concrete actions recommended by the working group include:

- The EU energy label for products should be revised and regularly updated according to the development of the improved energy efficiency of products;
- Promote energy efficiency requirements and certificates for buildings;
- Adapt online advisors (to compare lifecycle energy costs of different domestic products – new with new and old with new) - and place them on well-visited internet portals;

10. Working Group 2: Eco-design and Life Cycle Thinking – ways to energy efficient products?

This working group addressed standards and product information needs, design, and product innovation on energy efficiency and sustainablility. Participants identified lack of awareness, knowledge, capacity, and incentives with consumers, as well as SMEs as main obstacles on the way to energy efficient products. Business should take a pro-active approach to providing and promoting energy efficient and sustainable products. With supply chains becoming increasingly globalised, taking a Life Cycle Approach requires commitment and information from all parts of the chain – which is sometimes difficult to achieve. But not only end-consumers and producers, also retailers and the public sector should take responsibility in procuring sustainable products.

Concrete actions recommended by the working group include:

- Governments should develop concerted public awareness campaigns to promote Life Cycle Thinking and raise consumer expectations that products should meet minimum standards of sustainability;
- Business should be required to provide information on energy efficiency of their products and services in advertising by a certain date (e.g. 2015);
- The Marakesh Task Force on Sustainable Products should develop effective networks for the priority products.

11. Working Group 3: Renewable Energy – New energy sources, new consumption modes?

This working group discussed changing consumer preferences with regard to renewable energy such as buying green electricity or renewable heating. Members of working group 3 emphasised the role of consumer attitudes and behaviour throughout their discussion of renewable energy (RE) sources and the consumption of RE. Changing attitudes and behaviour was thus considered the key challenge in the discussion. Two important strategies to tackle this challenge were discussed: information and education on the one hand and pricing on the other hand. Internalising environmental costs and revealing the “real” price of products would give a significant signal to consumers. On the other hand information on alternative, renewable options needs to be made more readily available and accessible to consumers, for example through energy agencies or renewable energy centres.

Furthermore, informed consumer choice making use of renewable energy options should be achieved not only for end-consumers but also government and business procurement. It is important to share information among governments and stakeholders on successful renewable energy diffusion options and distribute best practice approaches on successful consumer mobilization strategies for RE awareness and consumption.

Concrete actions recommended by the working group include:

- National governments should create awareness through curriculum development (in primary schools, vocational training, and universities; specific for products & consumption);
- Public authorities should buy at least 20 % green electricity by 2012 (this could be followed up by the Task Force on Sustainable Public Procurement);
- Marrakech Task force on sustainable tourism should promote the use of ‚green' hotels & youth hostels to inform guests on RE & EE.

12. Working Group 4: Public Procurement – Setting efficiency incentives

This working group addressed the potential and limits of public (and private) procurement to stimulate energy efficient consumption. The participants stressed the catalytic role of public procurement activities to stimulate energy efficient consumption and the consumer role of governments at all levels (federal, national, subnational and local). Green procurement policies ('green procurement is understood to include procurement of products and services with the least negative environmental impact and the highest energy-efficiency throughout their life-cycle. Other aspects of sustainability should also be given due consideration') offer environmental, social, and economic advantages - for both consumers and producers. Key areas to promote sustainable energy consumption range from energy consuming office appliances to the entire building and construction process.

The participants stressed the strategic role of green public procurement for innovations in the area of energy efficient products and services with positive impacts for the competitiveness of economies. Therefore, political leadership and commitment to green procurement on all levels is a key requirement for successful sustainable consumption and production.

Concrete actions recommended by the working group include:

- Emphasise the leading role of the UN system and the European Commission in implementing green procurement in their own purchasing;
- The Sustainable Building and Construction Task Force will develop guidelines for the introduction of energy efficiency criteria to be used at all steps of the building and construction process, and will provide input about them to the CSD 14 and 15;
- The Sustainable Public Procurement Task Force will strengthen the role and dissemination of eco-labels as a benchmark for purchases in the field of products;

13. The co-chairs' conclusions highlighted the need for immediate, concrete action. Targetting the "low-hanging fruit" of feasible, low-cost actions seems an obvious and necessary step. Such actions are important both to realise short-term successes and to stride towards long-term aims, such as changing consumption patterns. Immediate activities should focus on simple but effective measures, such as public procurement of energy efficient light bulbs. Another cost-effective example with far-reaching energy efficiency potentials are smart meters for households.

14. On the policy level the co-chairs highlighted the need to build on the multiplicity of existing policies and initiatives to take forward selected priorities in regard to energy consumption. Involvement of all stakeholders is key to this process. At the EU level, existing policy processes already have created stakeholder platforms and dialogues. During the meeting the relevance of the Marrakech Task Forces was stressed and concrete proposals developed for their work.

15. The revised EU Sustainable Development Strategy puts Sustainable Consumption and Production high on the list of key priorities. The European Union will develop an Action Plan on Sustainable Consumption and Production, which will be an important vehicle for improving coherence and synergies between existing policies and tools, as well as prioritization and implementation of the suggested actions on sustainable energy consumption.

16. The co-chairs higlighted that the outcome of this meeting will be taken forward to the CSD with the aim to establish sustainable consumption and production as one of he main cross-cutting issues thorugh all CSD cycles, as well as to highlight some key issues regarding energy consumption in the CSD14/15 cycle which addresses energy for sustainable development, air pollution, industrial development and climate change.

Working Group Summaries

Working Group 1: Energy Savings in Households – A utopia?

Working Group 1 was of the opinion that that huge energy savings in the household could be achieved by way of applying the existing stock of energy efficient technologies. The main concern should therefore be on appropriate dissemination of information targeting the household, as knowledge of energy efficient consumption is poor, and technology for efficient energy use is often poorly employed. A special focus should also be given to energy savings through efficient heating, cooling, and appropriate insulation of buildings.

To address key issues, participants made various recommendations, mainly in the field of awareness raising and information exchange. With specific individualised awareness and information campaigns, consumers should be sensitised toward energy efficient consumption. The information should not only contain numbers and figures on energy consumption, but also give concrete recommendations in order to facilitate a shift in attitudes and behaviour. Energy-labelling of products needs to be reviewed to provide more targeted information to consumers. Participants in the working group recommended developing a colour-coded energy label supported by life cycle costing estimations. For example, a red label could thereby effectively communicate a negative life cycle cost performance of the

product to the consumer, even if the net price might be lower than that of a similar product. Moreover, the identification and publication of energy consumption values for buildings should be highlighted or initiated. The conflict of interest between the owners of buildings (for whom energy costs are secondary) and those renting (who are paying energy bills) needs to be addressed. Another major interest of participants was the restructuring of energy tariffs provided by energy suppliers. The tariffs should ideally hold fewer fixed elements and more variable costs. Thus to optimise the incentives for savings, the price per unit should increase with increasing consumption. Smart metering systems in every household should support the change in consumer behaviour by comparing energy consumption with previous consumptions.

Participants proposed several concrete actions to put the recommendations into practice:

- The EU energy label for products should be revised and regularly updated according to the development of the improved energy efficiency of products;
- Promote energy efficiency requirements and certificates for buildings;
- Conduct peer reviews of national household energy-labelling schemes;
- Develop mechanisms of co-decision, co-investment and co-benefit between house/ flat owners and tenants;
- Set up energy funds for poor citizens for investment in energy efficiency (cheap loans);
- Establish a technical committee by ISO to develop common international standards for domestic energy consumption;
- Adapt online advisors (to compare life cycle energy costs of different domestic products – new with new and old with new) - and place them on well-visited internet portals;
- Promote smart metering systems and restructured energy tariffs by energy suppliers;
- Adapt online advisors for energy systems of buildings;
- Initiate national stakeholder round tables to define targets, measures, follow-up, and feed-back;
- Prepare a booklet to demonstrate gaps between current practice and best available technology.

Working Group 2: Eco-design and Life Cycle Thinking – Ways to Energy Efficient Products?

Participants of Working Group 2 identified lack of consumer awareness as one of the main issues to tackle in order to promote energy-efficient products. Due to a lack of easily accessible information on product performance - or just because they set different priorities - consumers often take a passive role in deciding whether sustainable products are successful on the market or not. Consumption is, however, not only driven by end-consumers but also a question of public procurement and business-to-business trade. With supply chains becoming more and more globalised, businesses –as well as monitoring organisations- face difficulties in enforcing energy efficiency along the supply chain. Reasons for this can be

either unavailability or even unwillingness to provide information on suppliers' energy performance. Moreover, especially SMEs often lack knowledge, capacity, and also incentives to apply a life cycle approach to product design. On the other hand, not only producers but also retailers need to take on responsibility in providing energy-efficient goods and services. All three – consumers, traders, and producers – require more coherent legal and policy frameworks from governments.

The working group further discussed visions for a road to energy-efficient and sustainable products. Participants recommended that governments should commit themselves strongly to supporting sustainable innovations. This could be achieved by adopting benchmark standards on sustainability in all available policy measures - standards for sustainable public procurement are but one example. A vision for the private sector could be a competition to provide sustainable products for consumers' needs (end-consumers, other businesses, or the public sector). Furthermore, business should take a pro-active role in promoting more sustainable solutions (goods and services) for consumers. The consumers, on the other hand, should also expect products to meet minimum standards of sustainability and increasingly adopt a life cycle perspective when deciding what to buy.

In order to achieve this vision, the working group recommended the following concrete actions:

Governments should

- Implement all measures they have already committed themselves to in various initiatives (e.g. 3Rs, G8, 1Watt for standby);
- By 2010 adopt at least minimum sustainability requirements in all available policy measures;
- Introduce effective economic measures to support market building for innovative sustainable products – and discourage products which do not meet minimum standards of sustainability;
- Put in place immediately active campaigns to raise consumers' expectations of product sustainability;
- Connect with EC IPP projects
  - on product information needs to promote Type I, II, III environmental information
  - on IPP metrics and measurements
- Create eco-design competence centres to promote sustainable products;
- Promote knowledge and technology transfer to emerging economies such as China and India (e.g. by including them in IPP network);
- By 2010 have a map of remote impacts of supply chains to their markets.

European Commission should

- Propose framework directive covering non energy using products, which strongly contribute to global warming (modelled on the EuP Directive).

Business should

- Include information on sustainability of their products and services in advertising by a certain date (e.g. 2015).

Task Force on Sustainable Products should

- Strengthen links to the European Commission's Project on "IPP-Product Information Needs" and on IPP metrics and measurements;
- Ensure that there are effective networks to support development of sustainable standards.

Working Group 3: Renewable energy – new energy sources, new consumption modes

The participants of working group 3 emphasised the role of attitudes and behaviour throughout their discussion of renewable energy (RE) sources and the consumption of RE. On the one hand, working group members thought of attitudes and behaviour as crucial driving forces for the diffusion of renewable energies through 'bottom-up' demand. On the other hand, where this demand is lacking, incentives are considered important for increasing positive public attitudes and behaviour regarding renewable energies.

Participants agreed that price is an important issue in fostering an increase of RE consumption. While some saw price-based incentives as the most promising route to enhancing RE demand, others highlighted the mediating role of attitudes and transaction cost (convenience). Fiscal policies thus have important steering functions. In this connection, feed-in tariffs were considered an important issue that has in some countries led to positive incentives for the diffusion of various forms of RE (e.g. in Germany), while other countries have seen the positive effect from this measure focused selected technologies (e.g. small hydropower in Slovenia). Taxation of CO2 emissions was mentioned as another fiscal measure with potential positive impacts for RE. At the same time, the high subsidies of fossil fuels were considered counterproductive from that perspective. Besides coherent fiscal strategies, working group participants agreed that setting the "the right price" of products by internalising external costs is important.

The decentralised, local character of most renewables makes them less costly for countries in transition or developing countries compared to establishing expensive, centralised energy provision solutions. At the same time, all countries may have to deal with differing interests between these two groups of energy providers. Participants also pointed to EU member states' role in transferring RE technologies to transition and developing countries and thus increasing their access to RE sources, such as the use of hydropower in Serbia and Montenegro.

Finally, as a conclusion of the key issues of this working group, the co-chairs pointed to the fact that everyone is a consumer: households, businesses, and governments. Each of these groups thus makes consumer choices and has equivalent rights and responsibilities.

Before this background, the working group participants agreed that communication and education play a key role in changing consumers' attitudes and behaviour. For example, the French public's sceptical stance towards wind energy was considered to be rooted in a lack of information on the technology and contextual issues. Serbia and Montenegro has set up an energy efficiency agency to inform consumers and has gained good experiences with this approach, which participants recommended to apply in other countries.

Another aspect of information that the working group participants highlighted was the dissemination of experiences. Three areas were given particular attention in the discussion: the sharing of best practices in implementation, sharing of successful strategies in mobilising consumer demand for RE, and in the area of sharing knowledge by communicating research results relevant to the promotion of consumer behaviour.

Corresponding to the key issue of fiscal mechanisms and economic incentives, participants recommended developing and implementing appropriate mechanisms that would help set "the right price", encourage innovation, and thereby address consumption in particular.

Finally, picking up on the specific challenge that most countries face with their old housing stock that is fitted with traditional heating systems, it was recommended that RE policies could pay particular attention to addressing residential heating and cooling, efficient use of energy in homes, as well as insulation of public and domestic buildings.

The working group proposed following concrete actions:

- Set goals: number of solar-thermal ‚roofs' in the EU annually (especially public buildings, such as schools, universities, and hospitals) (to be developed and monitored further by Task Force on Buildings & Construction);
- National governments should create awareness through curriculum development (in primary schools, vocational training, and universities; specific for products & consumption);
- Public authorities should buy at least 20 % green electricity by 2012 (this could be followed up by the Task Force on Public Procurement);
- Communication campaigns (by consumer organisations, NGOs, businesses, in partnership with governments and media) to raise awareness of RE & EE consumption (previous examples include "Are you doing your bit?", "Aus, wirklich aus?");
- Renewable energy centre(s) in every EU country (incl. demonstration, shop, teaching...);
- Task force of Marrakech-Process on sustainable tourism should promote the use of ‚green' hotels & youth hostels to inform guests on RE & EE;
- Provide start-up funding for innovation (e.g. 'Competitiveness and innovation programme of the European Union', EC patient capital initiative' and private sector);
- Promote RE (e.g. cooking & electricity) in developing countries, e.g. through EU Energy Initiative, donors;

- Take up consumption-related issues with RE organisations/initiatives and enhance communication between RE community and mainstream (e.g. public planning);
- Include RE & EE in SCP research programmes.

Working Group 4: Public Procurement – Setting efficiency incentives

The participants of Working Group 4 stressed the catalytic role of public procurement activities to stimulate energy efficient consumption. Against the backdrop that procurement spending in all public agencies in the EU amounts to about 16% of EU-wide GDP, public authorities can influence market developments, and lead the private sector and consumers. This concerns the procurement of electrical appliances and other energy-consuming office appliances as well as building and construction processes.

To realise these potentials, participants stressed a number of key issues that need to be addressed as priorities. By communicating the future challenges of public procurement to governments and public authorities the debate needs to move from “green” to “sustainable” procurement. Sustainable procurement policies offer environmental, social, and economic advantages for societies and are not only a requirement for environmentally sound behaviour. Therefore, the strategic role of sustainable public procurement for innovation of energy efficient products and services should be highlighted to policy makers and public authorities at all levels. As a result, technology innovations developed for goods and services used and provided by the public sector can help increase the competitiveness of the countries. The creation of “Living Labs” would strengthen the enabling environment for sustainable innovations as they become platforms for direct interaction between public consumers and producers. The Working Group 4 participants emphasised that public procurement is too often reduced to purely technical questions. They identified a lack of awareness regarding the important political and strategic character of public procurement decisions.

Consequently, participants agreed that political leadership and commitment to sustainable procurement is a key requirement for successful sustainable consumption and production. As a part of this political leadership it is crucial to effectively communicate the objectives of the procurement approach to public authorities at all levels of government. To facilitate the understanding of the underlying rationale of sustainable public procurement measures, capacity building efforts at all levels are needed. One step in this direction is, for example, to inform consumers about the huge energy efficiency potentials of the building and construction sector. As the discussions pointed out, there are a number of entry points for taking actions to increase energy efficiency during the entire building process. Considering energy efficiency requirements is both part of the planning and construction process of new buildings, as well as use, maintenance, and retrofit of existing buildings. Another step is to design an initiative for one specific product group, such as energy efficient light bulbs, to give a concrete example of how sustainable public procurement can become reality. For this purpose multipliers (e.g. churches) can be involved in order to create a critical mass of institutional consumers.

To improve the performance of public procurement the participants agreed on a number of recommendations. A broad awareness raising project about sustainable procurement policies and actions is needed. As numerous examples mentioned during the discussions indicated, there is hardly a lack of experience in this regard. However, insights about successes and shortcomings of sustainable procurement approaches need to be compiled and distributed to trigger policy and technology innovations. The participants recommended setting up supportive structures for capacity building and disseminating best practices in cooperation with the private sector. The Working Group especially emphasised the leading role of the UN system and the European Commission in implementing sustainable procurement in their own purchasing. It further recommends that European governments should introduce energy efficiency criteria in all its funding decisions. In addition, peer reviews among governments of sustainable procurement practices focusing on energy efficiency should be initiated. These reviews can be accompanied by regular control and monitoring mechanisms in order to systematically assess success and deficits.

The working group proposed following concrete actions:

- Emphasise the leading role of the UN system and the European Commission in implementing sustainable procurement in their own purchasing;
- European governments should introduce energy efficiency criteria in all funding decisions;
- Introduce peer reviews among governments on sustainable procurement practices focusing on energy efficiency;
- Finland will take the lead on the Marrakech Task Force on „Sustainable Building and Construction“ (SBC), which has several links to public procurement, taking into account relevant activities by UK and Sweden (as part of the EU Environment Technologies Action Programme);
- The SBC Task Force will develop guidelines for the introduction of energy efficiency criteria to be used at all steps of the building and construction process, and will provide input about them to the CSD 14 and 15;
- The Marrakech Task Force on “Sustainable Public Procurement” (SPP) works on a toolbox to promote sustainable public procurement and to develop communication strategies specifically on energy efficiency as a first step using EU experiences on green public procurement;
- The SPP Task Force will strengthen the role and dissemination of eco-labels as a benchmark for purchases in the field of products;
- The Marrakech Task Forces will look for opportunities to organise a Side Event during CSD-14 on energy efficiency, including public procurement and sustainable building and construction.

Working Group 1

Energy Savings in Households –
An utopia?

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Key Issues

- Energy efficient technologies exist but are poorly known and applied - and are not accessible for people in fuel poverty
- Consumer information concerning energy efficient consumption is not individually relevant
- Energy efficient heating & cooling systems and proper insulation should be priorities as they consume the main part of energy

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Recommendations

- Personalise information and awareness campaigns on energy efficiency to change behaviour & attitudes of consumers and businesses;
- Train planners, engineers, builders and other stakeholders;
- Share best-practices internationally;
- Bring energy efficiency into the educational curricula;
- Develop colour coded energy labelling including life cycle cost estimates for products (positive/ negative labelling);
- Develop a scheme for energy labelling of all buildings/ flats;
- Revise tariff structures to encourage energy efficiency;
- Make energy consumption visible through smart metering systems in every household.

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Concrete Actions

- Introduce peer review of national household energy labelling schemes;
- Develop mechanisms of co-decision, co-investment and co-benefit between house/ flat owners and tenants;
- Set up energy funds for poor citizens to invest in energy efficiency (cheap loans);
- Establish a technical committee by ISO to develop common international standards for domestic energy consumption;
- Adapt online advisors (to compare lifecycle costs of different domestic products – new with new and old with new) - and place them on well-visited internet portals;
- Adapt online advisors for energy systems of buildings
- Initiate national stakeholder round tables to define targets, measures, follow-up and feed-back;
- Prepare a booklet to demonstrate gaps between current practice and best available technology.

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Working Group 2

Eco-design and Life Cycle Thinking – ways to energy efficient products?

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Issues

Governments

- Lack of a coherency, lack of mechanism to set minimum standards for non-EuP, need for engagement at global level.

Business

- Supply Chain: lack of data and transparency, lack of commitment all the way down the supply chain;
- SMEs: lack of awareness, knowledge, capacity, incentives;
- Retailers: lack of responsibility for the sustainability of products they sell.

Consumers

- Persistence of markets for unsustainable products
- Passivity of consumers, negative perceptions, lack of interest and tools to act

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Visions/ Recommendations

Governments

- Commit to support innovation (by adopting ambitious sustainability standards in all available policy measures, e.g. procurement);
- Support capacity building in eco-design for sustainable products, especially for SMEs;
- Take responsibility for the remote impacts of supply chains to their markets.

Business

- Compete to provide and invest in development of more sustainable and appropriate products (B2B, B2C, B2G) taking a forward looking precautionary approach;
- Actively promote more sustainable solutions (goods & services) based on life cycle information.

Consumers

- Should expect products to meet minimum standards of sustainability and increasingly choose to buy the best (not the cheapest) – from a life cycle perspective.

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Concrete Actions (1)

Governments

- Do all things they have already committed to do (e.g. 3Rs, G8, 1Watt);
- By 2010 adopt at least minimum sustainability requirements in all available policy measures;
- Introduce effective economic measures to support market building for innovative sustainable products – and to discourage products which do not meet minimum standards of sustainability;
- Immediately, active campaigns to raise consumers‘ expectations of product sustainability should be in place;
- Connect with EC IPP projects
  - on product information needs to promote Type I, II, III environmental information
  - on IPP metrics and measurements
- Create eco-design competence centers to promote sustainable products;
- By 2010 should have a map of remote impacts of supply chains to their markets.

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Concrete Actions (2)

European Commission

- Propose a framework directive covering non energy using products modelled on EuP-Directive.

Business

- By a certain date (2015??) all advertising should contain information on sustainability of the product or service.

Task Force on Sustainable Products

- Ensure that there are effective networks to support development of sustainable standards.

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Working Group 3

Renewable energy –
new energy sources,
new consumption modes?

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Key Issues

- Attitudes & behaviour; incentives to change them (bottom-up demand approach),
- Pricing & price;
- Further technology research & product development;
- Decentralised, local character of most renewables;
- Fiscal policies (e.g. feed-in tariffs, CO2 taxes);
- Diffusion of innovation from niche to mainstream market;
- Transfer of & access to RE technologies to transition and developing countries;
- Everyone is a consumer (households, business, government) => consumer choice (rights & responsibilities), public procurement: lead by example.

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Recommendations

- Strengthen information, communication & education - considering specific audience/target groups;
- Focus on win-win: RE, environment, new jobs, import dependence, energy security, etc.;
- Disseminate experiences (best practice in implementation, mobilising consumer demand for green energy & for products using RE, communicating research results, etc.);
- Develop economic incentives & mechanisms (setting the right price, encourage innovation, addressing consumption);
- Strengthen RE policies addressing buildings, in particular heating & cooling demand (e.g. through energy efficiency & RE agencies);
- Develop international cooperation and capacity building: institutions and governmental organisations;
- Stronger link with organisations and partnerships that already exist (e.g. JREC, EREF, REEEP, REN21…);
- Strong need to address EE & RE in transport.

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Concrete Actions (1)

- Set goals: number of solar-thermal ‚roofs' in the EU annually (especially for public buildings). This could be developed and monitored further by Task Force on Buildings & Construction;
- National governments should create awareness through curriculum development (in primary schools, vocational training, and universities; specific for products & consumption);
- Public authorities should buy at least 20 % green electricity by 2012 (-> task force Public Procurement);
- Communication campaigns (by consumer organisations, NGOs, businesses, in partnership with governments and media) to raise awareness of RE & EE consumption (e.g.: “Are you doing your bit?”, “Aus, wirklich aus?”, …);
- Renewable energy centre(s) in every EU country (incl. demonstration, shop, teaching...);

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Concrete Actions (2)

- Task force of Marrakech process on sustainable tourism should promote the use of ‚green' hotels & youth hostels to inform guests on RE & EE;
- Provide start-up funding for innovation (e.g. ‚EC patient capital initiative' & private sector);
- Promote RE (e.g. cooking & electricity) in developing countries, e.g. through EU Energy Initiative and other donors;
- Take up consumption-related issues with RE organisations/initiatives and enhance communication between RE community and mainstream (e.g. public planning);
- Include RE & EE in SCP research programmes.

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Umwelt Bundes Amt
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Working Group 4

Public Procurement –
setting efficiency incentives?

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

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Priorities

- Highlight the strategic role of sustainable public procurement as a forerunner for innovations in the area of energy efficient products and services;
- Use opportunities to involve industry associations in the capacity building for public procurement;
- Raise awareness that public procurement is a political not just a technical issue;
- Highlight the need for both: political leadership and capacity building on all levels;
- There is the need to move from “green” to “sustainable” procurement;
- Inform about the huge uncaptured energy efficiency potential within the building and construction process.

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Recommendations

- Strengthen the communication about the potential of sustainable procurement policies and actions on all levels and within the CSD process;
- Set up supportive structures for capacity building and disseminating best practices in cooperation with the private sector;
- Emphasize the leading role of the UN system and the European Commission in implementing sustainable procurement in their own purchasing;
- European Governments should introduce energy efficiency criteria in all funding;
- Introduce Peer Reviews among governments on sustainable procurement practices focusing on energy efficiency.

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Concrete Actions

- Finland will take the lead on the Marrakech Task Force on „Sustainable Building and Construction“ (SBC) which has several links to public procurement;
- The SBC Task Force will develop guidelines for the introduction of energy efficiency criteria to be used at all steps of the building and construction process and provide input about them to the CSD sessions 14 and 15;
- The Marrakech Task Force on “Sustainable Public Procurement” (SPP) works on a toolbox to promote sustainable public procurement and to develop communication strategies specifically on energy efficiency as a first step;
- The SPP Task Force will strengthen the role and dissemination of eco-labels as a benchmark for purchases in the field of products;
- The Marrakech Task Forces will look for opportunities to organize a Side Event on energy efficiency including public procurement.

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Annex B: Conference Programme

Sustainable Energy Consumption"
European Conference under the Marrakech-Process on Sustainable Consumption and Production (SCP)

Venue: Federal Foreign Office (Auswärtiges Amt)
Werderscher Markt 1, 10117 Berlin (**Entrance: Unterwasserstraße 10**)

Time: Tuesday, 13 December 2005, 09.00 – 18.00
Wednesday, 14 December 2005, 09.00 – 13.00

Tuesday, 13 December

09.00 – 09.30 **Registration**

09.30 – 11.00 **Plenary Session**

Co-chairs:

Susanne Lottermoser
Deputy Director-General, German Federal Ministry for the Environment

Timo Mäkelä
Director, European Commission, DG Environment, Directorate G

Statements by:

Astrid Klug
Parliamentary State Secretary, German Federal Ministry for the Environment

Arab Hoballah
Head, Production and Consumption, UNEP DTIE

Timo Mäkelä
Director, European Commission, DG Environment, Directorate G

11.00 – 11.30 **Coffee/Tea**

11.30 – 13.00 **Plenary Session:** Multi-Stakeholder Panel and plenary discussion

Holger Krawinkel, Federation of German Consumer Organisations - vzbv
Allan Asher, Energywatch, United Kingdom
Martin Charter, Centre for Sustainable Design, United Kingdom

13.00 – 14.30 **Lunch**

14.30 – 15.00 **Plenary Session: Introduction to Group Work**

Peter Hennicke, President, Wuppertal Institute

15.00 – 16.30 **Working Group Session I**

Working Group 1: Energy saving in households – an utopia?

Co-Chairs: **Gunilla Blomquist** (Ministry of Sustainable Development, Sweden)
Anne Solgaard (ForUM for Environment & Development, Norway)

Working Group 2: Eco-design and Life Cycle Thinking - ways to energy efficient products?

Co-Chairs: **Chris Baker** (Dpt. for Environment, Food and Rural Affairs, UK)
Prof. Dr. Marina Franke (Procter & Gamble Service GmbH, Germany)

Working Group 3: Renewable energy – new energy sources, new consumption modes?

Co-Chairs: **Alenka Burja** (Ministry for Environment, Slovenia)
Dr. Rolf Wüstenhagen (Institute for Economy and the Environment at the University of St. Gallen (IWOe-HSG))

Working Group 4: Public Procurement – setting efficiency incentives?

Co-Chairs: **Philip Kristensen** (Swiss Agency for the Environment, Forests and Landscape)
Kaarin Taipale (Coordinator of the Finnish SCP Task Force)

16.30 – 16.45 **Coffee / Tea**

16.45 – 18.00 **Working Groups continued**

19.30 **Dinner Reception**

Restaurant „Diekmann im Weinhaus Huth"
Alte Potsdamer Straße 5

Wednesday, 14 December

09.00 – 10.30 **Working Group Session II**

10.30 – 11.00 **Coffee / Tea**

11.00 – 12.30 **Report from the Working Groups and discussion**

12.30 – 13.00 **Co-Chair's Summary**

End of the meeting

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Annex D: Background Paper

Sustainable Energy Consumption

Background Paper

European Conference under the Marrakech Process on Sustainable Consumption and Production (SCP) Berlin, 13-14 December 2005

This paper was prepared by the UNEP/Wuppertal Institute Collaborating Centre on Sustainable Consumption and Production (CSCP).

Sustainable Energy Consumption
Background Paper

European Conference under the Marrakech Process on Sustainable Consumption and Production (SCP)

Berlin, 13-14 December 2005

8 December 2005

cscp
UNEP/WUPPERTAL INSTITUTE COLLABORATING CENTRE ON SUSTAINABLE CONSUMPTION AND PRODUCTION

This paper was prepared by the UNEP/Wuppertal Institute on Sustainable Consumption and Production (CSCP) in collaboration with the Wuppertal Institute for Climate, Environment and Energy. It was written by Michael Kuhndt, Stefan Thomas, Tomoo Machiba, Stefan Lechtenböhmer, Volker Türk, and Dietmar Schüwer.

Table of Contents

1 Introduction

1.1 Background

In the Johannesburg Plan of Implementation, all countries were called on to "encourage and promote the development of a 10-year framework of programmes (10YFP) in support of regional and national initiatives to accelerate the shift towards sustainable consumption and production" (Chapter 3). In response to this, several initiatives have been launched and the Marrakech Process - the designated programme for the development and implementation of 10YFP – was set up. Two international meetings (in Marrakech, Morocco and San José, Costa Rica) and various regional consultation meetings have taken place. The first European regional meeting took place in Ostend, Belgium, 24-26 November 2004 and involved European governments and stakeholders from all societal groups.

The upcoming meeting in Berlin will be the second European meeting of the Marrakech Process. Whereas the Ostend meeting had a general thematic focus, the Berlin meeting will focus specifically on sustainable energy consumption. It will address the issues that relate to energy use in households, offices and industry, but will not deal with those related to transport, energy generation and energy distribution.

Energy issues relating to sustainable development were discussed at inter-governmental level for the first time at the Ninth Session of the Commission for Sustainable Development (CSD-9), held in April 2001. Countries agreed that stronger emphasis should be placed on the development, implementation and transfer of cleaner, more efficient technologies and that urgent action is required to further develop and expand the role of alternative energy sources. In its 2006-2007 work cycle (CSD-14/15), CSD will review the progress in the areas of energy for sustainable development, air pollution/atmosphere and climate change along with industrial development. The outcomes from this Berlin meeting will also contribute to the discussion in the CSD sessions.

1.2 Objectives of the meeting

The general objectives of this meeting are to:

- contribute to the implementation of the Johannesburg commitments on sustainable consumption and production;
- contribute to the CSD 2006/07 work cycle where energy for sustainable development is one of the key topics;

- position SCP as one of the most important across-the-board issues within all the CSD work cycles;
- demonstrate the technical and economic potential for making energy consumption (and production) more sustainable;
- share information on ongoing activities and identify priority areas as well as potential gaps in policies and tools;
- identify key areas and corresponding measures for the implementation of sustainable consumption and production (SCP), and
- identify the role of each stakeholder group in the implementation processes (who does what?).

1.3 Objectives of this background paper

Within the overall objectives of the meeting, this background paper serves the following objectives:

- to outline the technical and economic potential for making energy consumption more sustainable through raising energy end-use efficiency and combining it with the use of renewable energy sources, as well as highlighting the policy priorities and challenges necessary to harness the potential;
- to briefly review the current status of policies, and
- particularly to provide background information for the four working groups which will convene during the meeting to discuss the themes of energy savings in households (WG1), eco-design and life cycle assessment (WG 2), renewable energy (WG 3), and public procurement (WG 4).

As it is written for a European conference of the Marrakech Process, this paper mainly focuses on European challenges, but also aims to provide good practice examples to other countries, especially emerging and transitional economies.

2 Technical Potential, and Policy Priorities and Challenges

2.1 Global challenges

Energy consumption is the ultimate cause of the challenges faced by energy supply and energy policies. Levels of consumption determine the need for energy supply and are, therefore, one side of the equation for the security of energy supply. Levels of consumption are also a key determinant in the overall cost of the energy supply system and the overall levels of emissions harmful to health and the environment.

Current trends in global energy use are far from sustainable. Oil demand continues to grow, while experts expect a historic peak in oil production within the next 20 years. Carbon dioxide (CO_2) emissions from fossil fuel combustion in 2002 were about 13% above the 1990 levels, whereas a stabilisation of the climate would demand a reduction by 50% until 2050 and further reductions thereafter. For OECD countries this would mean a reduction target of 60-80% in order to allow developing countries a certain temporary increase in emissions. In order to achieve this, global primary energy consumption would need to stop growing, while OECD energy consumption would need to decrease. Currently, nearly one third of the world population has no access to electricity and another third has only poor access. Reliance on traditional fuels for cooking and heating can have a serious impact on health and the environment. On the other hand, the world's richest people, earning over 20,000 US dollars per annum, consume nearly 25 times as much energy per person as the poorest people.

However, energy is merely an intermediate good. Consuming energy is a means to an end, that end being the provision of energy-related needs ("energy services") such as cooking, maintaining a comfortable indoor temperature, producing goods, and providing mobility. The ultimate challenge for sustainable energy consumption and production is, therefore, to satisfy the appropriate level of energy-related needs of every human being by using a variety of technologies and fuels tailored to local conditions rather than merely increasing energy supplies, while keeping the overall cost and environmental damage as low as possible.

How can the use of energy in households, offices and industry become more sustainable? Although challenges vary greatly in different parts of the world, the ways of achieving sustainable energy consumption can be summarised in the following four basic options:

a) Demand-side energy efficiency (also termed energy end-use efficiency): This most important option relates to technical, organisational and individual measures to reduce the final energy needed to heat/cool our houses, produce goods etc.

b) Co-/tri-generation: Introduction of on-site co- or tri-generation of heat, cold, and power can dramatically improve energy efficiency on the supply side. This option is largely related to the issues of energy generation and distribution. It is, therefore, only further discussed here in relation to its applications at consumers' sites (e.g. in industry or public buildings).

c) Renewable energy: The third option is renewable energy produced and used on-site through biomass or solar thermal collectors etc. as well as that fed into the electricity grids.

d) Limiting energy services: The final option could be to limit the amount of energy services we use (e.g. by capping dwelling floor space) to a level sufficient to cover our energy-related needs. Assessing this is, however, highly subjective and for that reason will not be discussed further in this paper.

2.2 Demand-side energy efficiency and on-site co-/tri-generation

2.2.1 Potential

Demand-side energy efficiency involves an array of hundreds of different technologies for numerous energy uses in different sectors. To name a few, these include thermal insulation of buildings, energy-efficient household appliances, fluorescent lighting with T5 or T8 lamps, electronic ballasts, efficient luminaries, daylight or occupancy sensors, variable speed drives to control the power of electric motors etc. The implementation of measures depends on re-investment cycles and the decisions made by a large number of decision-makers who have different degrees of information and varying preferences. The same is true for small-scale on-site co-/tri-generation.

In its recent Green Paper on Energy Efficiency, *Doing More With Less*, the European Commission stated that "the EU could save at least 20% of its present energy consumption in a cost-effective manner, equivalent to 60 billion euros

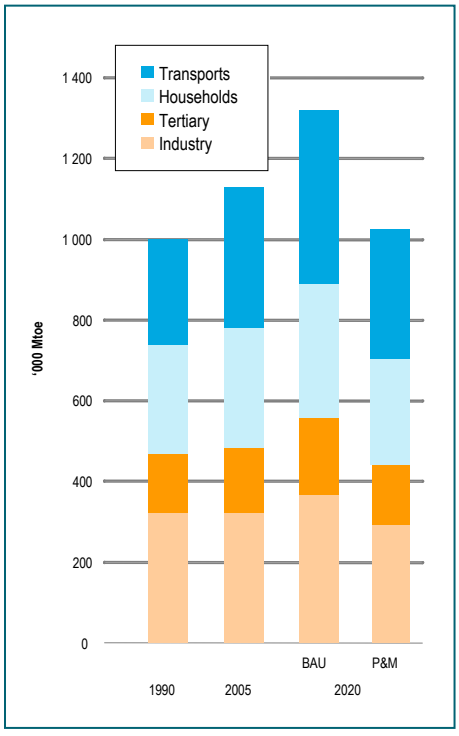

Figure 1. Final Energy Demand in the EU-25 by sector in million tonnes of oil equivalent (Mtoe), comparison of BAU and P&M scenarios

per year, or the present combined energy consumption of Germany and Finland". "Cost-effective" means that it is cheaper to invest in saving energy than to supply or purchase the same amount of energy. On average, it would cost 1-2 eurocents to save one kilowatt-hour (kWh) of fuel and 2-4 cents to save 1 kWh of electricity. On the other hand, saving energy would avoid the long-term system costs to the national economy – 2-3 cents for 1 kWh of fuel and 5-6 cents for 1 kWh of electricity. Furthermore, the fuel prices for consumers are currently no less than 5 cents per kWh and electricity prices are 10-15 cents per kWh.

A recent policies and measures (P&M) scenario for the 25 EU Member States (EU-25) analyses the possibility of achieving a substantial reduction in greenhouse gas emissions by 2020. This scenario illustrates a strategy that fulfils about 80% of the currently available energy savings potential. It is assumed that via this strategy, decision-makers are better informed and will change their P&M towards incorporating the best available energy-efficient technologies.

Figure 1 shows that in this P&M scenario, energy demand would be reduced by 22.3% by 2020 compared with the business-as-usual (BAU) scenario. This is equivalent to energy savings of almost 2% per annum. Instead of an increasing energy demand of 1.1% per annum in the BAU scenario, a reduction of the demand by, on average, 0.4% per annum can be achieved in the P&M scenario.

Another recent study shows that improvements in the energy efficiency of new equipment and buildings by 5% or more per annum seem to be realistically achievable if a targeted innovation strategy is in place in industrialised countries. This study further shows that over a period of 50 years, such improvements can reduce the total energy consumption by 1% per annum (in absolute terms) and, therefore, may be capable of cutting the energy demand by half by the middle of the century. The other study projects that the average electricity consumption of home appliances can be reduced by 25% by 2010 and 33% by 2030, while the profit per ton of CO_2 emissions avoided is expected to be 160 euros.

As seen above, most of the technical potential for demand-side energy efficiency and on-site co-/tri-generation can be cost-effective, but only a small part of the potential has been exploited so far. A plethora of market barriers deriving from the diversity of energy-efficiency technologies – such as lack of information, prioritisation, funding, incentives and management capacity – leads to this deplorable reality.

2.2.2 Priorities and challenges

As Figure 1 shows, significant energy savings can be made in all three sectors under consideration here – households, tertiary, and industry. However, public policies need to support market actors to overcome the barriers mentioned above.

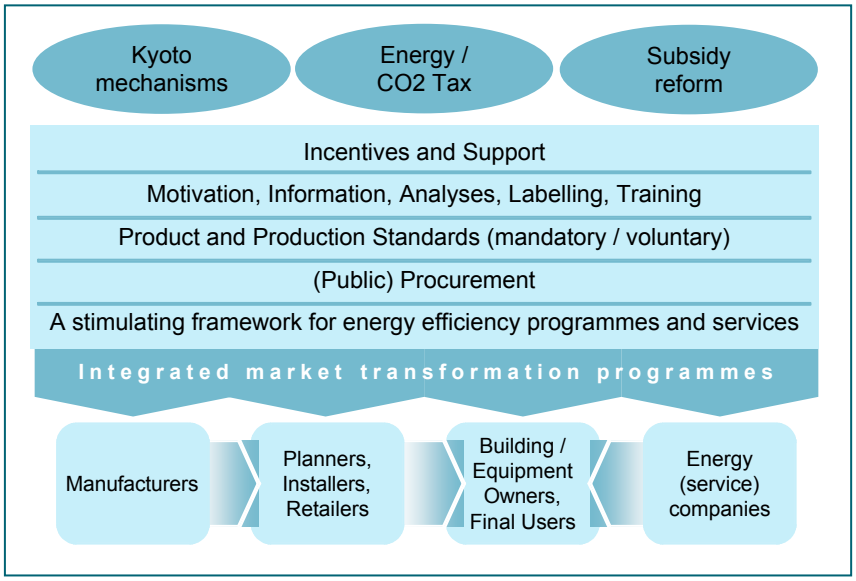

Figure 2. Innovative Energy Efficiency Policy – the Basic Package

An effective policy for energy efficiency requires a combination of information, practical guidance, regulation, and financing incentives ("sticks, carrots, and tambourines"). Figure 2 gives an overview of the basic package, which consists of general economic instruments (top) and sector or technology specific instruments (the box in the centre). The package needs to be adopted by each actor in the market chain in order to realise energy-efficient buildings and equipment (shown at the bottom). An appropriate policy mix is required to make their actions for increased energy efficiency feasible, rewarding, and straightforward.

While most of the specific instruments listed in the box in Figure 2 directly address final customers or technology providers, energy policies can, and should, also involve energy companies and specialised energy service companies as professional intermediaries. They can mediate between the providers and customers of energy-efficient end-use solutions to overcome a multitude of barriers and to reduce the transaction cost for energy efficiency measures. Their mediation will multiply the effects of economic and legislative instruments such as energy taxes, minimum energy efficiency standards and labelling.

However, such professional intermediaries cannot work alone. Public policies need to create a framework that stimulates energy efficiency programmes and services. This can be done, for example, by creating a special fund that finances energy efficiency programmes, or by setting an energy efficiency obligation for energy suppliers or network companies, coupled with the permission to finance programme costs via energy prices. Such an obligation could also be coupled with a system of tradable energy saving certificates (“white certificates”). Energy performance contracting (EPC) is also in need of public policy support and promotion.

One of the basic tasks of energy policies is to ensure that energy prices reflect the true environmental and social costs by reducing subsidies for non-renewable sources and in-

corporating external cost by means of energy taxes etc. To correctly evaluate the cost and benefit of energy efficiency measures, it is important not to compare the marginal cost of saving energy with subsidised electricity prices but with the total systems cost (i.e. cost of production, transmission, distribution, and reserve capacity cost plus subsidies from the government). Emissions trading, the Clean Development Mechanism (CDM) and Joint Implementation (JI) (the Kyoto mechanisms) are additional policy instruments that should support energy efficiency and its integration with renewable energy. However, the small and dispersed nature of energy efficiency improvements leads to relatively high transaction cost. Simplified procedures for small-scale CDM/JI projects could provide a solution.

2.3 On-site renewable energy

2.3.1 Potential

Both the passive and the active use of renewable energy in a decentralised manner are of particular importance. Renewable energy not only generates clean energy but also has the potential to reduce levels of investment in large-scale networks, power plants and other centralised energy supply technologies.

The utilisation of passive solar energy can be achieved primarily by optimising the design of buildings in particular ways to:

- achieve high solar heating gains which can be supported by special translucent insulation of walls;
- make optimal use of sunlight for lighting purposes through the orientation and sizing of windows, shades and light transportation systems (mirrors, glass fibres), and
- prevent high thermal loads of buildings by shading, and natural and night cooling.

The above passive optimisation of buildings can be supplemented by the following active renewable energy technologies:

- Direct use of solar thermal energy for warm water and heating, and solar cooling;
- Integration of photovoltaic cells into the façades of buildings and possibly into efficient low-voltage in-house electricity grids;
- Use of biomass for heating and, with micro-scale combined heat and power (CHP) devices, for electricity generation, and
- Exploitation of local thermal energy potential (particularly geothermal and waste heat) using highly efficient heat pump technology.

Numerous examples show that, by intelligent planning, high insulation levels and optimisation of windows, the energy use of new residential and office buildings can be reduced to almost zero at a reasonable cost – even under central European climate conditions. By

integrating photovoltaics (PV), buildings can produce more energy than they consume over the course of the year. Almost the same level of efficiency can be achieved by retrofitting existing buildings. Solar radiation can provide, in moderate climates, more than 50% of sanitary hot water and meet up to 20% of space heating demand with the current available technologies. Under warmer conditions, up to 100% of hot water can be provided by solar energy. Examples of daylight use, and passive and active solar cooling systems show that the energy demand in intelligent office buildings can be mostly met by renewable energy.

2.3.2 Priorities and challenges

As the passive solar use and many options for active solar use are predetermined during the design and construction phase of buildings, integrated building planning must be promoted among planners, architects and developers. Specialised tools for solar optimisation of buildings and bigger developments need to become standard.

Effective legal instruments to foster solar and renewable development include:

- Inclusion of provisions for passive solar use and prevention of high summer heat loads in spatial planning and building codes;
- Financial support for the installation of solar collectors and other renewable heat generation systems, and
- Making renewable energy use mandatory in building codes as in Spain, or imposing quotas of renewable energy supply in new buildings or developments (e.g. the eligibility criteria for the demonstration scheme of 50 solar settlements in North Rhine-Westphalia, Germany).

3 Current Status of Policies

On the EU level, the following existing or planned policies can be assumed to have considerable effects on demand-side energy efficiency and on-site renewable energy:

- The Directive on the Overall Energy Performance of Buildings
- The Framework Directive on the Eco-Design of Energy-using Products (EuP)
- The forthcoming Directive on Energy End-use Efficiency and Energy Services
- A revised Energy Labelling Framework Directive has been proposed in the report of the European Climate Change Programme. It would widen the scope of the existing implementing directives on energy labelling.
- The European Parliament has called for a Directive on Renewable Heat and Cold.

In the current 25 EU Member States and the accession countries, as well as in the EEA countries, these EU directives form the framework for national energy efficiency and renewable energy policies.

The EU also provides programmes in the areas of communication and research to promote energy efficiency and sustainable energy sources across Europe as well as developing countries. The Intelligent Energy – Europe (IEE) programme co-finances international projects, events, and the start-up of local or regional agencies relating to energy efficiency, renewable energy and alternative fuels. The Sustainable Energy Europe 2005-2008 Campaign was launched in the framework of IEE, aiming to raise public awareness and promote sustainable energy production and consumption among individuals and public and private organisations.

Many good practice examples from European and other countries demonstrate how a supportive framework with adequate policy instruments can increase energy efficiency in the final energy demand. The following examples are particularly notable:

- The Danish Electricity Saving Trust finances innovative energy efficiency programmes. Those programmes are expected to save around 7% of the electricity use in the household and public sectors by 2008, whilst achieving net economic savings for consumers and society.
- Building codes in countries such as the Netherlands and Germany were taken into consideration in the development of the EU Directive on the Overall Energy Performance of Buildings. Due to the progressive standard introduced in 1996, energy efficiency improvement of residential buildings in the Netherlands accelerated to more than 5% per annum.

- The energy efficiency programmes of electricity and gas suppliers under the Energy Efficiency Commitment scheme in the UK will save 7% of private consumers' energy use between 2002 and 2008. The economic benefits of the programmes have been proven to be four times higher than their cost.
- Industrial and commercial enterprises and public administrations in Finland have implemented 50-70% of the energy-saving potential identified by detailed energy analyses subsidised by the government.
- Energy management and benchmarking networks in Norway will contribute to saving around 1% of the total energy use in the industrial and commercial sectors each year.
- The Czech Republic has been particularly successful in promoting energy performance contracting.
- The Spanish government announced that it would spend 8 billion euros between 2005 and 2006 on measures to limit energy demand.

Non-European examples include Japan's Top-Runner programme, energy labels for appliances in Thailand and energy efficiency legislation in India.

It would be appropriate for goods traded worldwide to have a global policy on their energy efficiency so as to harmonise product standards. For example, a performance target for the stand-by power consumption of electrical appliances can be universally set below 1 watt to encourage energy efficiency innovations. For goods which are traded only on a regional or national scale, and for buildings and production facilities, the exchange of knowledge on energy efficiency and renewable energy policy should be firmly promoted by the UN and governments. One of the first tools in this area of development is the Collaborative Labeling and Appliance Standards Program (CLASP) that promotes efficiency standards and labels in developing countries.

Under the framework of the Global Environmental Facility (GEF), relatively few energy efficiency and on-site renewable energy projects have been funded so far, although the multi-country Efficient Lighting Initiative is a good example. Only 4% of the first 202 CDM projects that were approved, or are close to approval, by the CDM Executive Board target energy efficiency. Although 75% of the projects relate to renewable energy, these would only generate around 20% of the total amount of certificates acquired from all projects. The difficulties and a possible way forward have been mentioned in Chapter 2.

4 Challenges for the Working Groups

As discussed in Chapter 2, energy end-use efficiency and on-site renewable energy use in households, offices and industry comprise many different technologies for numerous energy uses in different sectors, involving a large number of decision-makers. The decision-makers include component suppliers, manufacturers, architects, designers/planners, wholesale and retail traders, installation contractors, specialised energy efficiency consultants, specialised energy service companies, energy companies, building owners and other investors, tenants, and users of energy-efficient equipment.

Four topics – energy savings in households (WG1), eco-design and life cycle assessment (WG 2), renewable energy (WG 3), and public procurement (WG 4) – have been chosen to facilitate discussions to unravel these complex relationships. The challenges for the working groups will be to:

- acquire an overview of the current debate;
- discuss forthcoming challenges;
- identify areas for concrete measures, and
- identify potential areas for exchange and co-operation between participating countries.

Notes to the Working Groups

Working Group 1: Energy Savings in Households – A utopia?

Scope

This working group will discuss the consumption phase of energy using products. The issues cover all sectors except transport, ranging from technical solutions such as the use of stand-by modes for electronic appliances and the thermal insulation of buildings, to soft approaches for changing household behaviour, such as communication strategies. The main objectives are to:

- highlight the potential for energy efficiency in European households;
- share experiences and best practices (what works, what doesn't);
- demonstrate framework conditions for energy-efficient household consumption;
- identify solutions which make it easier and more convenient to choose energy-efficient goods and to adopt behaviour which focuses on the efficient use of energy;
- identify communication strategies or other methods to make households behave in more energy-efficient ways, and,
- if possible, initiate concrete implementation measures.

Current status of discussion

- Around 90% of the energy use of products throughout their life cycles stems from their consumption phase. However, 80% of the energy use in the consumption phase is determined at the time of the initial investment or reinvestment in the products. Alternative energy-efficient choices often require more investment at the point of the initial decision-making. Supporting the choice of energy-efficient buildings and goods is, therefore, highly significant.
- The remaining 20% of energy use can be influenced by the behaviour of households; for example, by turning off lights and turning down thermostats when rooms are not in use, and only using washing machines and dryers at full load.
- Space heating accounts for 66% of household energy consumption in the EU. The most effective means of increasing energy efficiency in households is, therefore, the thermal insulation of existing and new buildings. Passive houses can make energy savings of up to 90%. Optimisation of the heating system – boilers, hydraulic setting of

pipes and thermostats, and pumps – can also produce energy savings of 10-30% of heat and up to 80% of electricity.

- Almost one third of all electricity in OECD countries is consumed by home appliances. Energy-efficient lighting and electronic equipment offer a similar saving potential. A++ refrigerators and freezers can reduce electricity consumption by around 50%.
- A policy package to assist households in making it easier to choose energy-efficient goods includes: mandatory/voluntary energy labelling (e.g. Energy Star programme), minimum energy performance standards (e.g. Japan's Top-Runner programme, new EU Framework Directive on the Eco-Design of Energy-using Products), databases of energy-efficient products (e.g. www.topten.info website initiated in Switzerland), individual advice, financial incentives to attract households to energy-efficient alternatives and information and awareness campaigns. .
- It is also critical to make energy efficiency easy and attractive for the players in the market chain of the supply of energy-efficient buildings, products, and services (manufacturers, retailers and sales staff, planners, installation and service contractors). They need to understand the market and the profitability of energy-efficient solutions so that these technologies can be applied within households. Additional policies in this area include professional training and co-operative or public procurement.
- Some good policy examples were referred to in Chapter 3 of the overview. Those examples prove that it would be possible to achieve energy savings of 1.0-1.5% in the household sector, while at the same time bringing net economic savings to households and society.

Forthcoming challenges

- Very few countries have, as yet, formulated and implemented a coherent policy strategy to harness the energy efficiency potential in households. By identifying the size and cost-effectiveness of the potential, an optimal package of instruments can be developed. The forthcoming EU Directive on Energy End-use Efficiency and Energy Services, which has as its target a 1% energy saving per annum in households, will offer a good opportunity for EU Member States to develop such a strategy.
- An example of such a strategy is the UK's Action Plan on Energy Efficiency. For the household sector, the action plan includes the Energy Efficiency Commitments (mentioned in Chapter 3 of the overview), tax incentives for private landlords to invest in more energy-efficient buildings, a network of energy advice centres, special funding for insulation and improved heating systems for low-income households, and a revision of the building code to implement the EU Directive on the Overall Energy Performance of Buildings.

- Studies often find that households are primarily concerned with the purchase cost and are only prepared to pay extra for energy-efficient products if there will be a rapid return on this investment. Where there is little market incentive for producers to invest in energy-efficient features (e.g. new buildings), regulatory policies such as building codes have been more effective. For other products, economic incentives and further guidance such as Germany's Sustainable Shopping Basket would help consumers' decision-making. Innovative market-based instruments such as energy performance contracting (EPC) also need to be developed and tested. It is important to set a framework stragety and a policy package according to product types and replacement cycles, taking social and cultural conditions into account.
- Research and development (R&D) efforts on energy efficiency, therefore, should not only relate to technical improvements, but also focus more on understanding markets, market barriers, the policy instruments and energy services that can overcome those barriers, and how to measure their effects in terms of energy and cost savings.

Some questions for discussions

- Which technical solutions make energy efficiency in households easy and convenient, and have the greatest potential to be cost-effective?
- What approaches and policy instruments can support households in making more energy-efficient investment choices and make the players in the market chain offer energy-efficient options to households?
- What role should the producers and energy companies play in promoting energy saving in households?
- What could be the role of R&D in technologies and in the implementation of energy efficiency, and what are the most important R&D needs?
- Is it possible to identify concrete implementation measures that could be initiated?

Working Group 2: Eco-design and Life Cycle Assessment – The road to energy-efficient products

Scope

This working group will focus on the design and production of products. Initiatives such as the EU Framework Directive on the Eco-Design of Energy-using Products, Integrated Product Policies (IPP), the UNEP/SETAC Life Cycle Initiative, and Japan's Top-Runner programme will be referred to in the discussion. The main objectives are to:

- share practical experiences (including industry presentations);
- discuss the role of the above initiatives and approaches;
- identify priority areas for future implementation work, and,
- if possible, initiate concrete implementation measures (e.g. voluntary commitments).

Current status of discussion

- Energy-using products consume about 30% of primary energy in the EU and are responsible for 40% of CO2 emissions.
- The analysis of regional priorities prepared for the 2nd International Expert Meeting in Costa Rica names eco-design and product-service systems (PSS) as approaches for business actions for sustainable development. The Asia-Pacific region emphasised the importance of tools such as life cycle assessment (LCA).
- Promoting a shift to more sustainable consumption requires the increase of both supply and demand for sustainable products. Demand-side energy efficiency measures are an important option for improving the sustainability performance in households, offices and industry, and products play an important role here. Most of the impacts arising from the consumption of products are, however, determined at the design stage. Consumers are often "locked in" to unsustainable patterns of consumption by the availability and affordability of products.
- Policy makers are recognising the need for policies that address the impacts which occur beyond the production phase, especially with regard to the use and disposal of products. For example:
  - Policy measures such as extended producer responsibility (EPR) are being used to promote the recycling of electronics and other products. The EU's new Directive

on Waste from Electrical and Electronic Equipment (WEEE) aims to increase the re-use, recycling and recovery of waste from a variety of consumer products.

  - Japan's Top-Runner programme aims to develop the world's best energy-efficient appliances. The programme sets energy standards for each type of product equal to, or more stringent than, the level of the best available technologies on the market.
  - The EU's Framework Directive on the Eco-Design of Energy-using Products aims at increasing energy savings from all electrical appliances. Measures for priority areas – heating, electric motors, lighting, domestic appliances, office equipment, consumer electronics, air conditioning, and stand-by losses – will be decided on in the next two years. They will define energy performance for each product and implement related labelling to enable to consumers to make informed choices. They will also encourage consumer responsibility in contributing to energy savings.
- There have been efforts to develop policies for particular products covering the whole life cycle. The EU's IPP calls for an approach that integrates three main areas – influencing prices, promoting green production and stimulating demand for green products.
- The most effective measures for improving the efficiency of appliances have generally been mandatory energy-efficiency standards. In the US, mandatory standards for a number of appliances, such as refrigerators and air conditioners, have been established. In the EU, voluntary agreements have been negotiated with manufacturers to improve the energy efficiency of a range of consumer appliances, including power supply units, televisions and DVD players. It is estimated that, in the EU, further measures of this kind could reduce total energy consumption by 10% by 2020.
- Not only energy-using products but also all other kinds of products need to be considered, since energy consumption is an issue throughout a product's life cycle. Improving the resource efficiency during production could, therefore, also be an effective strategy to reduce the product's "energy rucksack".
- Technological leapfrogging in energy efficiency may enable developing countries to accelerate improvements in living standards and bypass unsustainable patterns of consumption and production.

Forthcoming challenges

- Developing incentives for energy-efficient design that addresses the full life cycle and promoting skills in the private sector for LCA and eco-design remain as challenges.
- Increasing the awareness of the contribution that resource-efficiency strategies can make in improving the energy efficiency of products.

- An important issue for consideration is consumer preference and behaviour, how this influences what is produced, and how consumer preference and behaviour can be shaped in ways that promote more energy-efficient products.
- Increased product efficiency has generally been offset by even greater increases in overall consumption. In addition, the "rebound effect", by which increased efficiency reduces prices and stimulates greater demand, has been observed. In order to reduce absolute energy consumption by 1% per annum, taking into account economic growth, a yearly average growth rate of energy efficiency by 3% has yet to be realised. If the replacement cycles of products are taken into account, this requires new products that improve their energy efficiency by 4.7% per annum on average.
- Various research shows such efficiency improvement rates are technologically feasible. To achieve this, however, governments need not only to fund traditional R&D but also to help create markets for the deployment of energy efficiency innovations.

Some questions for discussions

- What is the role of governments in promoting concepts such as eco-design and instruments like LCA for energy-efficient products, in particular during the R&D phase? What are the roles and effectiveness of different instruments? How can best practice policies and programmes be disseminated and supported?
- How can industry be persuaded to take responsibility during the R&D, marketing, sales and after-sales phases for the impacts of consumption and disposal of the products?
- What kinds of communication, information and eco-labelling are most effective in influencing consumer choice?
- How have consumers' preferences been reflected in product design? How can consumers and producers (and designers) best interact in order to mainstream eco-design?
- How can eco-design and LCA be promoted in developing countries? What kind of support will be most effective?

Working Group 3: Renewable Energy – New energy sources, new consumption modes?

Scope

This working group will address the question of whether new energy sources lead to new consumption modes. Can renewable energy be regarded as an inexhaustible energy source and, therefore, will energy efficiency no longer be an issue of concern? Or should the use of renewable energy go hand-in-hand with energy efficiency? The main objectives are to:

- share practical experiences relating to these questions;
- develop strategies and projects that link the use of renewable energy and energy-efficient behaviours, and
- identify priority areas for future work.

Current status of discussion

- As the total impact from energy use results from both the amount of energy consumed and the mode of energy supply, we need to look at the two issues combined. It is important for policy makers to consider different energy options in order to minimise the impact at the lowest cost, whether renewables or non-renewables.
- Renewable energy (RE) sources, even though these include large hydropower, account for around only 5% of total energy production and consumption.
- Even though most of the sources for RE are inexhaustible, its generation and distribution still involves the input of materials. On-site RE systems require storage batteries that reduce environmental benefits. Energy use further causes consumption of electrical and other energy appliances, which involve material use.
- Assuming that a considerable greenhouse gas reduction of 60-80% by 2050 is required, energy efficiency (EE) and RE should be regarded as complementary. With a rate of 1% energy efficiency improvement per annum in the business-as-usual scenario, RE will have to grow by at least 14% per annum in the coming decades. If efficiency were to improve by 3% per annum, RE would have to grow by only 8% per annum. An improvement in EE makes a significant increase in the share of RE in the energy mix more achievable and cost-effective.

- The complementary use of RE and EE technologies can improve the security of the energy supply. Recent trends in oil prices would encourage countries to develop local energy sources and diversify energy portfolios as well as to improve energy efficiency.
- In the discussion about the harmonisation of RE and EE policies, it is important to take into account the differences between: 1) actors dealing with energy production and consumption; 2) motivations, experiences and behaviour patterns; 3) countries.
- Early movers for RE produced their own energy mostly as private individuals. They were motivated by the will to have green energy and/or to become independent from big suppliers. Those pioneers are generally sensitive to the interdependences between energy production/use and environmental issues. A survey shows that Bavarian solar thermal energy households had a better understanding of energy policies and supply systems while they, at the same time, had lower energy consumption than others.
- Due to the liberalisation of the European electricity market in 1998, consumers gained an opportunity to choose green electricity. Most RE in OECD countries is now generated or purchased by utilities and sold together with electricity generated from fossil-fuel sources. Furthermore, the investment in RE technologies either by private installations (e.g. PV), by joining operation companies (e.g. wind parks) or even by buying shares in a joint-stock company can create a return with interest subject to special conditions. In contrast to the original movers, these consumers and investors are not essentially sensitive to the efficient use of energy. They might even regard their commitment to RE as a justification for their energy consuming lifestyles.
- In some parts of the world, particularly in developing countries, the installation cost of on-site RE systems (e.g. PV in remote villages) can be significantly smaller than EE technologies, while the link of energy consumption and production is clearly observed. For example, using fluorescent lamps or LEDs instead of conventional light bulbs can reduce the power output of a PV-installed home by a factor of five.

Forthcoming challenges

- The existing policies and programmes often promote either RE or EE, not both, asking whether one or the other is a better (or the only) way to reduce energy consumption. How to make informed decisions about whether to focus on RE or EE in a specific case is not obvious. There is a need for a more system-integrated approach that links RE projects with an obligatory application of EE technologies. One good example is the Solar & Save programme in North Rhine-Westphalia, Germany, which encourages investment for climate protection projects in public schools among ordinary citizens using energy performance contracting (EPC).
- To attain the right mix of RE and EE, prices need to reflect the environmental and social costs of energy production.

- Public awareness of the interdependency between RE and EE is a very important factor in the promotion of the integrated approach. The communication of this issue in both expert circles and amongst the public is of as much importance as bringing different stakeholders together.
- A more innovative approach that integrates RE and EE technologies in product development should be encouraged, including the development of buildings and motor vehicles that combine EE features with RE sources.
- Significant financial resources for investment in RE and EE are needed, including the use of innovative financial mechanisms such as loan guarantees and the Clean Development Mechanism (CDM), and market-based instruments and public-private partnerships that can leverage scarce public funds. In Germany, the guaranteed purchase price of electricity from private PV installations has been about 50 eurocents per kWh for 20 years, far higher than the price of conventional power, which has created a considerable incentive for private investment in solar power.

Some questions for discussions

- How can policy makers and experts be motivated to integrate RE and EE? Is setting a combined target for RE and EE possible?
- Should the system-integrated approach become imperative for future programmes? Or should there be any exceptions?
- What kind of public support, communication, capacity building and financial mechanism will be required to achieve the approach and the accompanying processes?
- What should the roles of renewable energy equipment manufacturers and energy companies be in integrating EE in RE technologies? How can R&D for such integrated innovations be encouraged?
- How can RE consumers be motivated to use their energy efficiently? Is a new approach, different from that for conventional energy consumers, needed?

Working Group 4: Public Procurement – Setting efficiency incentives?

Scope

Governments can play a catalytic role in shaping consumption patterns, both through public policies and through their own procurement practices. Public procurement has huge potential to enable the market to provide more energy-efficient products and services, due to both its position as one of the principal buyers and also its influence over the private sector and consumer.

This working group will address the opprtunities and limitations of public procurement to stimulate energy-efficient consumption. In addition to concentrating on the procurement of electrical appliances and other energy consuming office appliances, the discussion will also focus on the building/housing sector. The main objectives are to:

- share experiences (presentations by procurement departments and other relevant organisations);
- illustrate the potential of public procurement in relation to energy efficiency, particularly in the building/housing sector;
- identify key areas for creating markets for energy-efficient products and services, and
- identify concrete measures to promote the procurement of energy-efficient products and services.

Current status of discussion

- The procurement spending in all public agencies in the EU accounts for 16% of the EU wide GDP or a sum equivalent to half the GDP of Germany. If all public authorities across the EU demanded green electricity, this would represent 18% of the EU's greenhouse gas reduction commitment under the Kyoto Protocol.
- The Johannesburg Plan of Implementation called upon all countries to 'promote public procurement policies that encourage development and diffusion of environmentally sound goods and services' (Chapter 3, para. 19c).
- In 2004, the EU adopted the new Public Procurement Directives that enable public purchasers to integrate environmental considerations into public procurement.

- A number of governments have already introduced public procurement legislation that requires, or encourages, public agencies to adopt green procurement policies and implementation plans and to report the results (Norway, Sweden, Japan, South Korea, etc.), while others take different measures including developing co-ordinated strategies and issuing executive orders and guidelines (e.g. UK's Sustainable Public Procurement Taskforce).
- A recent study proposes a co-operation of European governments to develop common standards and practical tools on public procurement of energy saving technologies.
- Several international networks have been established in recent years. Among them are the UN Expert Meeting on Sustainable Public Procurement, the International Green Purchasing Network (IGPN), and the Procura+ campaign organised by ICLEI Europe.
- Some developing countries have been rapidly accelerating their efforts for green procurement. In 2004, the Chinese government issued a policy document entitled Implementation of Government Energy Efficiency Procurement that called for a three-year programme to establish energy-efficient purchasing practices at all levels of government.
- The Energy Star label, first introduced in the US in 1992, is considered to be one of the most successful cases of public procurement for promoting energy efficiency. All federal government agencies were required to procure personal computers meeting the criteria. The standard for public procurement became a general standard for the entire market beyond the country.
- Public procurement can also be used to promote renewable energy. The Canadian government has made a commitment to purchase 15-20% of its electricity in the form of green power by 2010.
- The European Commission's SAVE programme conducted a study on Public Procurement of Energy Saving Technologies in Europe (PROST). The study shows that with additional investments in energy efficiency that have a pay-back time not exceeding five years, annual energy saving in the public sector worth up to 12 billion euros could be achieved in 15 EU Member States by 2020. This year, ICLEI Europe launched a three-year project, Dissemination of Energy Efficiency Measures in the Public Buildings Sector (DEEP).

Forthcoming challenges

- The biggest concern for public agencies in the promotion of green procurement is the extra cost incurred by purchasing sustainable products, since they need to pursue "best value for money". Striking a balance between conventional tender policies and

environmental criteria is difficult, whilst support from taxpayers is critical to justify the initiatives.

- The definitions of sustainable products as well as eco-labels are very diverse depending on country, sector, company, product and certification body. The lack of a unified approach has made it difficult for public agencies to adopt good practices.
- Adding environmental criteria into the public procurement process may create disadvantages or barriers for small and medium sized enterprises (SMEs) and producers in developing countries. Technology transfer and other support should be the key to promoting energy-efficient products and services among these groups.
- The criteria and practices of green procurement do not always include energy efficiency aspects for all types of products and services. Public procurement tends to look at individual products and services and has yet to be applied in an integrated manner for bigger projects such as the energy-efficient design of buildings and houses.
- For the product categories in which energy efficiency is applied less, public agencies need to co-ordinate their measures to incentivise R&D and procurement policies.

Some questions for discussions

- How can energy efficiency be integrated into public procurement? Should all the purchasing criteria include energy efficiency aspects?
- How can energy-efficient building/housing design be promoted in the context of green procurement?
- Is it possible to develop EU-wide or international common energy efficiency criteria applicable to procurement policies?
- What influence does public procurement have on the private sector's purchasing behaviours and R&D? How best can the synergies between the public and private sectors be created to expand the markets of energy-efficient products and services? How best can SMEs and developing countries be supported to initiate green procurement?

References

Blok, K. (2005) "Improving Energy Efficiency by Five Percent and More per Year?", *Journal of Industrial Ecology*, vol. 8, no. 4, pp. 87-99.

Borg & Co. AB (2003) *Harnessing the Power of the Public Purse: Final report from the European PROST study on energy efficiency in the public sector*, Stockholm.

European Commission (2001) *European Climate Change Programme: Report – June 2001*, Brussels.

European Commission (2004) *Buying Green!: A handbook on environmental public procurement*, Brussels.

European Commission (2005) *Doing More with Less: Green Paper on energy efficiency*, Brussels.

ICLEI Europe (2003) *The State of Play of Green Public Procurement in the European Union: Final report*, Freiburg.

Infas Enermetric (2001) *Untersuchung zum energiewirtschaftlichen Verhalten privater Haushalte mit Schwerpunkt Wärmepumpen und Sonnenkollektoren, im Auftrag des Bayerischen Staatsministerium für Wirtschaft, Verkehr und Technologie, Endbericht*, Greven.

International Energy Agency (2003) *Cool Appliances: Policy strategies for energy efficient homes*, Paris.

Kaupp, Albrecht (2004) *Policies for Energy Efficiency in Industry: India*, GTZ, New Delhi.

Mantzos, L. et al. (2003) *European Energy and Transport Trends to 2030*, DG Transport and Energy, Brussels.

Suding, Paul H. (2004) *Use the Carrot As Well As the Stick: How to increase efficiency of energy and resources in the urban construction sector of PR China*, GTZ, Beijing.

UK Government (2005) *Securing the Future: Delivering UK sustainable development strategy*, London.

UN Department of Economic and Social Affairs (UN-DESA) (2005) *Report on the Third Expert Meeting on Sustainable Public Procurement*, 15-17 July 2005, UN Headquarters, New York.

UN-DESA, UN Environment Programme (UNEP) and UNEP/Wuppertal Institute Collaborating Centre on Sustainable Consumption and Production (CSCP) (2005) *Making the Marrakech Process Work: Discussion paper for the 2nd International Expert Meeting on the 10-Year Framework of Programmes on Sustainable Consumption and Production*, 5-8 September 2005, San José, Costa Rica.

Virage Milieu & Management BV (2005) *Green Public Procurement in Europe: 2005 status overview, prepared for the UK presidency event, State of Play on Green Public Procurement in the EU*, 27-28 October 2005, London.

Wuppertal Institute (ed.) (2002) *Bringing Energy Efficiency to the Liberalised Markets: How energy companies and others can assist end-users in improving energy efficiency, and how policy can reward such action*, Short report with support from the European Commission, Energy and Transport DG, SAVE programme, Wuppertal.

Wuppertal Institute (ed.) (2003) *Energy Efficiency Programmes and Services in the Liberalised EU Energy Markets: Good practice and supporting policy, Background document for the European Conference "Bringing Energy Efficiency to the Liberalised Markets"*, 27-28 March 2003, Brussels, with support from the SAVE programme, Wuppertal.

Wuppertal Institute (2005) *Target 2020: Policies and measures to reduce greenhouse gas emissions in the EU*, Wuppertal.

WWF European Policy Office (2005) *PowerSwitch!: The energy efficiency challenge*, Brussels.