

CLIMATE OPTIONS FOR THE LONG TERM

COOL Europe



Report of Workshop 4

M. Andersson and W. Tuinstra eds.

8 December 2000
Hotel Crowne Plaza, Brussels

Wageningen UR
2001

COOL 01/E04

COOL Europe project team

A.P.J. Mol (Project leader)

M. Andersson

W. Tuinstra

Chairmen Workshop 4

G. Bennett

T. Kåberger

General Support Workshop 4

E. van den Bosch

A. Ignaciuk

M. Kok

COOL Europe - Wageningen University
Environmental Policy Group
Environmental Systems Analysis Group

Correspondence Address

Environmental Systems Analysis Group

P.O. Box 9101

NL-6700 HB Wageningen

The Netherlands

Phone + 31 317 484812

Fax + 31 317 484839

<http://www.nop.nl/cool>

Table of Contents

<i>Programme</i>	4
<i>Introduction</i>	5
Part I: Morning sessions	6
1.1 Energy group	6
1.1.1 Discussion on content	6
1.1.2 Discussion on editorial matters	10
1.2 Transport group	11
Part II: Policy Panel	14
2.1 Introduction	14
2.2 Panel discussion	14
Part III: Afternoon sessions	31
3.1 Energy group	31
3.1.1 The role of the private sector	31
3.1.2 The role of the public sector.....	32
3.1.3 Building commitment for the strategic vision.....	40
3.2 Transport	41
3.2.1 Actors and actions: government and transport sector	41
3.2.2 Sub group government	41
3.2.3 Subgroup (Private) sector actions	42
3.2.4 Discussions on the presentation of the document	44

Annexes

Programme

08.30-09.00 **Registration and coffee.**

09.00-09.15 **Introduction and welcome.**
Prof. Arthur Mol, Wageningen University, the Netherlands

09.15-10.30 **Work in sector groups on the strategic vision documents.**

10.30-11.00 **Coffee break.**

11.00-13.00 **Policy panel.**
Chairman: Tomas Kåberger, Chalmers University of Technology, Sweden.
Panelists:
Ms. Jan Corfee-Morlot, Environmental Directorate, OECD
Mr. Kevin Leydon, DG Energy and Transport, European Commission
Dr. Jan Pretel, Climate Change Unit, Czech Hydrometeorological Institute
Mr. Anders Wijkman, European Parliament

13.00-14.15 **Lunch.**

14.15-16.15 **Work in sector groups.**
The sector groups will first discuss the outcome of the policy panel and look at the implications for the strategic vision. The groups will then take decisions regarding changes, amendments and points for further elaboration. Clear guidelines should be given to the COOL Europe project team about how it should implement these changes (the third versions of the documents will to be ready by the second half of January 2001). Lastly, each sector group will discuss the strategy for communicating the key messages from the strategic visions to the appropriate target groups in Europe.

16.15-16.30 **Conclusion and final words.**
Prof. Arthur Mol, Wageningen University, the Netherlands.

16.30- **Snacks and COOL drinks. Farewell.**

Introduction

At December 8 2000, the fourth and final Climate OptiOns for the Long term (COOL) Europe Workshop took place at Hotel Crowne Plaza in Brussels. In this workshop, European stakeholders, policy makers, and scientists of the energy and transport sectors gathered to proceed with their discussions on long-term (2050) options for substantial CO₂ reduction. They discussed draft strategic visions and listened to the comments of a policy panel on these drafts. The workshop was organised within the framework of the Dutch COOL project, financed by the Dutch National Programme on Global Air Pollution and Climate Change. This project runs for 2.5 years (1998-2001) and involves discussions between policy-makers, scientists and stakeholders on the national (Dutch), European and global levels. The European part of the COOL project is organised by Wageningen University in the Netherlands.

The four workshops focused on the connection between strategies for Climate Change Policy in Europe with long-term sector strategies (Transport & Energy/Industry). The COOL project is not about predicting the future or planning the future. It is about learning about obstacles and conditions for a sustainable future; to deepen the understanding about what is required to achieve far-reaching emission reductions; to explore the long-term consequences of short term actions. Most important of all, the participants, coming from different backgrounds and countries, learn from each other and exchange views on the future. What are the expectations of colleagues in different countries? What are the different views on desirable actions? Are there possibilities for collaboration?

In order to accomplish this, the four workshops were organised in four steps: (1) the exploration of images of the future; (2) implementation trajectories connecting these images to the present; (3) formulation of short-term actions needed to reach long-term goals; and (4) elaboration of strategic visions integrating all these steps

During this fourth workshop, finalising two integrated strategic visions for the European energy and transport sector respectively was the most important subject. Amendments to draft versions were made, questions for further details and elaboration were selected, and plans for dissemination discussed.

Together with some additional scientific input, the results of this fourth workshop - as reported in this publication - will be integrated in the final draft strategic visions for the energy and transport sectors in Europe. The final drafts will be circulated to the participants of the European Dialogue in March 2001. The final integrated strategic visions will be concluded by May 2001 and are widely available from Summer 2001 onwards.

By then the energy and transport groups of the European Dialogue have produced a challenging strategic vision for the European energy and transport sector, with contributions by and supported by a wide diversity of stakeholders. This will form a major challenge for the public and private decision-making centres in Europe to take action in mitigating climate change, not only with respect to the distant future but especially also on the short term.

Part I: Morning sessions

1.1 Energy group

Participants:

M. Andersson, Wageningen University, the Netherlands
J.-P. Boch Centre de Recherches Elf Solaize, France
R. Bradley, Climate Network Europe, Brussels
P. ten Brink, ECOTEC Research and Consulting, Brussels
J.-Y. Caneill, Electricity de France, France
K. Doutlik, DG Enterprise, Brussels
C. Egenhofer, Centre for European Policy Studies, Brussels
N. Golovko, DG Enterprise, Brussels
E. Hille, Consultant, Poland
A. Ignaciuk, Wageningen University, the Netherlands
T. Kåberger, Chalmers University, Sweden (chairman)
S. Minett, Cogen Europe, Brussels
A. Mol, Wageningen University, the Netherlands
M. Sadowski, National Fund for Environmental Protection and Water Management, Poland
B-O. Svanholm, Birka Energy, Sweden
J. Szonyi, Wageningen University, the Netherlands
R. Thomas Sustainability Energy Initiative Shell, UK
D. Vorsatz-Urge, Central European university, Hungary

Tomas Kåberger, the chairman, summarised the comments on the draft strategic vision for the energy sector, which the participants had put on papers on the wall. After the comments had been gone through, the chairman asked the participants to set priorities by attaching stickers to those comments they considered to be most important. The ensuing discussion mainly focused on those comments that had gained most votes.

1.1.1 Discussion on content

Reference to other energy scenarios

One participant called for a reference to realistic energy scenarios, for example, scenarios used by the EU or the IEA. It is important to refer to these documents to increase the credibility of the draft strategic vision.

One participant suggested to make a cross-check of forward-looking scenarios, both of the forward-looking ones and the backward-looking ones, which already exist. Then it could be possible to use that as a sort of a scientific check and help, as a heuristic, to try to identify the options.

Another participant recalled that the whole purpose of this project is to go to the other end and look backwards. "If we use existing scenarios we are mixing what we are trying to do by mixing forward-looking and backward looking. I would be a little bit cautious about taking the option of taking something which has been agreed as a sort of forward-looking vision."

The hydrogen option

Several members of the stakeholder group brought the attention to the hydrogen option. One aspect that was discussed was the question of the establishment of a transmission infrastructure for hydrogen. One participant advocated strongly pre-combustion decarbonisation of fossil fuels to produce hydrogen because this would allow for a standing

start for hydrogen that would provide much more incentive to produce the infrastructure. This would be a more successful pathway towards a hydrogen infrastructure than the creation of a political constituency led by the European Commission. The chairman commented that pre-combustion decarbonisation of fossil fuels could be a good way of introducing hydrogen. It appeared that the whole group was in agreement on this point.

It was pointed out that it is worth at least considering the adaptation of the entire existing gas transmission network to the transmission of hydrogen. A country such as the UK is saturated with gas transmission infrastructure. If there is a way of adapting, then that also needs to be considered. The chairman said that that technological aspect had already been dealt with at a previous workshop.

The importance of local distribution grids for hydrogen distribution had gained some attention in the group. In connection with this one participant argued that the development of local markets is very important. It is not only a matter of pipelines but also electricity grids and other grids.

Biomass

Assumptions about land area use for the biomass option must be more specified. Furthermore, the carbon dioxide balance of biofuels has to be defined, even approximately. The chairman concluded that we need to pay some more attention to the issue of land use for biomass and the actual carbon balance of biomass. This is very much dependent on the way the biomass systems are designed.

How much biomass will actually be needed? The question whether biomass can meet the demand or not is related to another question: how much is the demand going to be? The possibility for demand-side reduction needs to be quantified. We have scenarios on the supply side but we do not have the same scenarios on the demand side. More quantification is needed as regards how much is possible to reduce.

Referring to the cost projections of biomass, one participant commented that if we are trying to have dual use of land then the costs become very different. Another member of the group commented that the cost of restricted biomass use is not as large as some of the costs for recreation. That has not been made explicit in the cost assumptions.

As regard to the biomass option in the context of EU enlargement, we should not forget the role of existing forestry policies. Part of the new land is already foreseen as an area for enlargement of forests, for afforestation. The role of afforestation for biomass production in this sense will be rather neglected. Furthermore, we should ask for clear agricultural policies in the EU. In response to this comment the chairman said that agricultural policy is one of the policy issues that has already been brought up, for example, the need for co-ordination of different EU policies has been highlighted.

One participant argued that the paragraph on biomass and competition for land needs to be clearer. Things like “cropland currently covers 30 per cent of total cropland (...)” are not clear. When we talk about competition for land use, we should not forget that oil is today not only used for energy purposes. Plastic and non-energy oil use may also need to be produced by biomass. That takes time. We have to show that we have thought about that as well.

Regarding energy forests and recreation it was noted that high intensity salix or any other forms of high intensity forestry is not particularly interesting for recreation purposes.

The social dimension

The chairman noted that several participants had indicated that they think that the social aspects should be included in the strategic vision document as a critical precondition. As one participant explained: "It seems to me that we cannot eliminate social aspects from this critical context. Especially since we propose to eliminate coal. There are problems with the coal miners with the whole social aspects of this issue." The chairman pointed out that the section about stranded assets partly is addressing that issue. Perhaps the social aspects should be more explicitly linked to this section.

One participant brought up the social aspects of transforming agricultural land to biomass farming. "There will be an immense change in the whole way of living. Especially since the broadening of the EU will lead to a lot of free land. The implicit message is that farmers in Poland are going to become unemployed and will have to move on to rotation crops or whatever."

Costs

It was noted that in the draft strategic vision there was a lack of short-term measures. The chairman said that there is a lot of support for more attention to economic aspects. The document says that the costs of drastic emission reduction is insignificant compared to the anticipated growth of GDP. According to one participant, "the new renewable technologies may become the most competitive and least expensive and possibly even increasing the GDP growth." Hence, we should not be too pessimistic in describing the transition to low emissions of carbon dioxide only as a cost. It is also an opportunity; once you get over the thresholds for renewable energy technologies they may in fact boost economic growth rather than the opposite.

The chairman went further through the comments on the wall. He noted that there was one comment on the biomass issue saying that cost estimates are missing. It would be very useful to explain in the document more precisely the estimated costs, at least some rough estimations. The chairman concluded that this comment relates to a previous note about the importance of learning curves, which is actually framing the conditions for new renewable technologies to become competitive compared to the conventional technologies.

One participant said that it is not necessary to discuss the absolute costs. Discussing the absolute costs would require a new project. But it would be interesting to discuss the relative costs, to see which options will become more competitive compared to the others.

Another participant brought up the issue of internalisation of external costs. It is an extremely important area. How are you going to do this? The whole process is very important in terms of addressing the balance on costs. What are the relevant costs? At the moment we are focussing on one part of that cost structure. So if we are really going to achieve this sort of cuts we need to tackle that process. The chairman informed that this group has dealt with the window of opportunity of introducing the carbon dioxide taxes in connection with the electricity price drop. One participant argued that "taxation can change the entire way you think about the competitiveness of renewables."

One member of the group claimed that the document takes a rather cynical approach to taxation: "We phase in the taxes when the fuel prices are low. And then when the fuel prices go up the taxation will bite. I think this is an inconsistency, it is not politically sustainable. I think you should rethink whether this is really sort of taking the consumers and the population with you. I have doubts about it."

Geographical distribution aspects

The geographical distribution issue was brought up in the discussion. Wind power is only going to be a real source in certain areas. Moreover, solar power and biomass is suited for some parts of Europe. Geographical considerations will have to be made in the development of international trade in biofuels.

The role of nuclear power

One participant said that the exclusion of nuclear power in the draft strategic vision was based on the wrong arguments. "At the last workshop we spent quite long time talking about the justification for excluding nuclear power. We had come to the agreement that we excluded nuclear because it is a sort of an on/off process. If it is on, then it has a big effect. But we do not know whether it will be on or not. It is not a gradual approach in contrast to most of the other technologies. Nuclear is either on or off. So we excluded it for that purpose which got us out of any holds about being pro or anti-nuclear which can derail this debate as we saw in the security supply paper. So the box on nuclear power is extremely important in defusing the argument that will come. I just think we lose the rest of the debate if we end up coming out overtly anti-nuclear."

Another participant made the following comment: "We accept that nuclear may have a contribution or not and that is a very political issue. One of the ways we approach this is to see whether we could achieve 80 per cent reduction without nuclear. Most of other studies have assumed that nuclear will play a big role. This document can actually say: can we do it without nuclear and what are the costs? You just get out of that whole debate whether nuclear is good or bad."

In the group there were some advocates of the nuclear power option. According to them, it would be premature to exclude nuclear power from the list of desirable options for the long term. Models running for nuclear power show that it is a cost-effective option, which has a role in the future efforts for mitigating greenhouse gases.

The chairman concluded that at least this exercise has showed that the 80 per cent reduction target can be achieved at a reasonable cost without nuclear power.

Climate policy in a sustainable development context

It was argued that climate change needs to be seen in the context of sustainable development, within Europe and world-wide.

Credibility and justifications

Regarding the credibility of the document it was emphasised that some things have to be proven in the document. Arthur Mol said that the COOL team will try to prepare a version for policy-makers with not too scientific language and not too much literature references.

It was noted that nowhere in the document has the carbon dioxide emission balance of various options been indicated. "Our goal is to reduce carbon dioxide emissions. So in the assumptions we must have a carbon dioxide balance associated and together with global carbon dioxide emission scenarios." Arthur Mol said that in the background report we will be more scientific in our figures.

1.1.2 Discussion on editorial matters

Clarifications

The chairman clarified that all the figures are in the input papers that have been used; the description here is just on the relative side, not on the total. Quantitatively, the energy efficiency improvements were in the order of economic growth. It was almost identically the same total energy use in 2050 as in the year 2000. This assumption was based on continuous energy efficiency improvements and structural change between different sectors of the economy.

The chairman noted that there were several comments that had to do with energy efficiency assumptions and total energy use in the 2050 vision. The document was criticised for not being explicit enough about the assumptions on total energy use and energy efficiency.

If we are assuming that there will be the same demand today as in 2050 – what are the assumptions behind it?

Technical improvements of the document

In addition to the pie charts describing the present situation and the future scenarios regarding the relative contribution of different primary energy sources we also need to show what the vision really implies a description of the total amounts of the different energy sources used and the total energy use.

One participant said it would be interesting to combine the two pie charts for the future images. So instead of pie charts the two charts could be tied together.

One participant argued that what people would like to see is not only the share of the fuels but also how the shares will be reflected in the total amount.

Other comments

It should be clearly stated for policy makers that if we cannot achieve 80 per cent emission reduction we must argue why.

1.2 Transport group

Participants:

- G. Bennett, Syzygy, the Netherlands (Chair)
- E. van den Bosch Wageningen University, the Netherlands (Notes)
- A. Kassenberg, Institute for Sustainable Development, Poland
- R. Kemp, MERIT, Maastricht University, the Netherlands
- M Kok, National Research Programme on Climate Change, the Netherlands
- A. Pastowski, Wuppertal Institute, Germany
- B. Quenault, MIES, France
- R. Sartorius, Federal Environmental Agency, Germany
- H. Somerville, British Airways, UK
- R. Torode, International Union for Public Transport, Belgium
- J. Trouve, Schenker BTL, Sweden
- W. Tuinstra, Wageningen University, the Netherlands (Notes)

A draft strategic vision for the transport sector had been circulated among the participants before the meeting. The session focused on the remarks and suggestions for improvement of the draft strategic vision. In telephone interviews in the week preceding the meeting already a start was made with collecting comments from the participants. The discussion built further on those comments and additional remarks. The remarks were structured in different categories. To enable focussed discussion the participants were asked to indicate which comments were most important to them.

In the table below all comments collected in the telephone interviews are presented. The * indicates which comments were most important to the participants present at the workshop.

Structure and editing
<ul style="list-style-type: none"> - mixed opinions about structure (alternative proposal for structure: landscape, regime, niche) * - improve coherence - length: 15 pages better than 20 - avoid academic language, be simple and concise - put table in annex, the story in the text * - link with energy vision ** - show process in diagram and link that with the structure of the strategic vision so that it is clear what is meant with options, key issues etc. *** - avoid duplications, short introduction, some key issues can be discussed shorter
Positioning and outline of strategic vision- tell the story
<ul style="list-style-type: none"> - show the reasons for developing strategic vision more clearly - let it be self-evident why the group explored the possibilities of 80 per cent reduction - show better how future may look like, be seductive - connect to current policy developments (COP-, green papers EC, enlargement process etc.) and show added value of long term perspectives COOL *** - show the specific problems of the transport sector when dealing with the climate problem* - all actions in path analysis can't be started at once; list selection of actions in first step, second step (priorities) * - connect strategy (action/actors) to path analysis - direct strategic vision to both public policy and private sector; is not yet balanced *****

Key messages the Strategic Vision should bring across
<ul style="list-style-type: none"> - the part on actions/actors and timing is most important - transport is too cheap - dare to take action - European responsibility, appropriate level to arrange many of the issues which member states can't deal with alone
Options
<ul style="list-style-type: none"> - differentiate mobility: different problems, different solutions ** - add technological options like the maglev train, fuel cars, bended wing aircrafts, non-motorised transport* - realism of centralised decentralisation is questioned - policy measures as a kilometer tax could be included - classify (show?) good practices ***
Key issues
<ul style="list-style-type: none"> - could be less lengthy - should not overlap with actions and actors - show examples of transition management - under awareness: stress the need for measuring and education - what is the core of the argument in the paragraph on uncertainties? - transition management: develop also "in-between-targets" as a way of dealing with uncertainties.

During the discussion more comments were formulated:

- rather show opportunities instead of obstacles in the table
- explain what is meant by "new" transport systems and "new" spatial systems
- how to reach 80% division over different measures ("Burden sharing")*
- timespan? Short -10 medium-25 long-50
- 80% not necessary in all sectors?
- fuel-cell/hydrogen
- energy efficiency can have more potential*
- institutional reform: not really clear what it is?
- promote innovation is not a clear measure
- waste management
- link with business and locations (ecoparc)
- what facilitating measures will have most effect?

Comments which were considered the most important were:

- to show the process in diagram and link that with the structure of the strategic vision so that it is clear what is meant with options, key issues etc.
- to direct the strategic vision to both public policy and private sector; this is not yet balanced
- to link with the energy vision
- to classify (show?) good practices
- to differentiate mobility: different problems, different solutions
- to connect to current policy developments (COP-, green papers EC, enlargement process etc.) and show added value of long-term perspectives COOL

Some of these comments were discussed in more detail:

1) *Show the process in diagram and link that with the structure of the strategic vision so that it is clear what is meant with options, key issues etc.*

- Options and key issues were perceived to be a bit mixed. There should be a better distinction between options and key issues. It should be clear what kind of process the COOL process has been. A diagram will help to understand the table and to show the process. The horizontal connection between the columns was not really clear, a possible link could be made by numbering. Also it was not clear what the connection was between the options in the table and whether the options were meant to be elaborated examples or meant to be clusters.
- There is not such a good balance between the different parts of the strategic vision document. Also in the table too much is suggested for the short-term. At the same time it should be clear that short-term actions should prepare for long-term change. The options should be shown: their impacts as well as the needed measures.
- A way should be found to introduce the complexity of the matter and in the same time to reduce the complexity. Formulating the main message in fewer words could serve this purpose. The paper could be stronger and more efficient in communication clear priorities and a strong message should be formulated. The main message should be to bring about structural change. It should be clear that institutional change is important.

2) *Connect to current policy developments (COP-, green papers EC, enlargement process etc.) and show added value of long term perspectives COOL*

It was argued that although COP6 was not a success, still much can be done. Especially because COP6 did not focus on the long term. The COOL document could demonstrate should that many groups in society (private industry and others) are already doing more than politicians are able to agree on.

3) *Direct the strategic vision to both public policy and private sector*

With regard to this comment it was remarked that one of our recommendations in the paper itself also should be that there should be a better balance between policy actions and business actions.

4) *Classify good practices*

With regard to this comment it was agreed that this would be very interesting and important to do, but would be beyond the scope of the document.

Part II: Policy Panel

Participants:

Ms. Jan Corfee-Morlot, Principal Administrator, Climate Change, Environmental Directorate, OECD

Mr. Kevin Leydon, Head of Unit, Clean Urban Transport, DG Energy and Transport, European Commission

Dr. Jan Pretel, Head of the Climate Change Unit, Czech Hydrometeorological Institute

Mr. Anders Wijkman, Member of the European Parliament

Chairman: Dr. Tomas Kåberger, Chalmers University of Technology, Goteborg, Sweden

2.1 Introduction

Tomas Kåberger, the chairman of the policy panel, invited the participants to comment on the draft strategic visions for the energy and transport sectors. The panellists were asked to identify points where these documents give added value in relation to the current debate. They were also asked to identify the weak points of the documents and to make suggestions for improvements.

2.2 Panel discussion

Jan Corfee-Morlot

We mostly look at the very short-term challenges and the short-term hurdles, but it is often hard to connect the short term to the long term, so that is the value here. In the energy area the paper is quite strong. From a technical point of view it has two focus points: biomass-intensive image and the solar/hydrogen image. And this indeed are two of the longer term futures that we all hope will be coming about with some important policy push in the near term. The transport paper is a very solid piece of work, looking at integrated approaches to bring about inter modal shifts, fuel substitution, the importance of public awareness etc.

I would say in terms of weak points, I think a lot more could be done with respect to economic aspects and policy implications. Policy implications of some of these visions are really somewhat unclear. I think clearly we are looking for a pathway providing cost-efficiency but also clarity and rigour on the environmental targets. Sometimes the logic of why these targets are what they are is missing.

When it comes to the policy makers promoting such targets they have to have that kind of logic. The challenge is really to look in many ways across the different sectors. Here we have energy as a whole, which does connect to transport. But essentially your visions start with the same target. Why? It might be more realistic in the transport sector to allow less rigorous targets and to seek more severe, radical reductions in other parts of the economy. Let us think about those options, rather than fixing at the outset what we think that the specific environmental targets need to be. Because in the end what you need is flexibility to go to some of the least cost solutions, to go where there is perhaps more dynamic technical change, and a more radical and logical way for the other parts of the economy. The social connections

are important and these papers start to make those connections. There are clearly going to be winners and losers, but this is, at least in our view, one of the major research gaps. The key question is really: how to manage this transition? I would like to see much more focus in any type of future work on how do you handle this transition. What exactly are the near-term policy implications for these long-term visions?

Some of these papers have suggestions, but at this point they are still quite weak suggestions. It would be interesting to see these develop into integrated strategies. In particular one of the policy connections that is missing throughout both of these papers is the idea that you could achieve multiple policy objectives through climate policy.

What are the connections to very near term real policy problems that climate solutions can bring? I will just give you a couple of examples. If we are moving to hydrogen economies or if we are moving to biomass economies essentially what we are talking about is improved urban air quality, improved human health, lower congestion problems, fewer deaths and respiratory diseases in the cities. And not to mention some of the regional benefits that might come about of some of these systems. Regional benefits could include less pollution of soils, improved agricultural output, and better forest systems. And in the end, these are the benefits that will make a policy sell or not in the very near term. So we need to identify and connect these policies. Climate change policies cannot be made in a vacuum or will essentially not happen. We can start to branch out and see climate policy in a bigger context, and really force this integration.

That is what we in the OECD have been calling the ancillary benefits of greenhouse gas mitigation, and our work (based on a literature study) actually indicates huge benefits, potentially 30-100 per cent offset of the cost of direct mitigation. Now there is controversy on how these numbers have developed, but even if they are only partially right, which I doubt, there is actually quite a growing potential there.

Another point I wanted to make is about energy security. There is a very real threat on the current pathway that our economies become increasingly dependent on foreign sources of energy. What do these alternative futures provide there? You have a little bit in one of the papers on energy security but it is not this issue, it is more about the domestic security of the supply issue.

Some points on the COOL Europe process. It seems to me perhaps a model for discussion, for connecting the research community with the policy community. I have found the concept fascinating and I have enjoyed the previous session that I have attended. I would like to explore this in terms of the way that we see governments work as well. The real question for me is whether you can work in a dialogue session that actually has an impact with respect to the gaps for new research, and then let that research be policy driven rather than a research agenda for the sake of research.

Jan Pretel

The draft strategic visions are really useful and I would like to speak out my appreciation for your effort. It seems to me that after COP-6 in The Hague there is a real necessity to speak on long-term climate change strategy.

It is clear that in the EU there is a lot of potential for emission reductions and that the EU must have a leadership role in the climate policy process. Before the Kyoto Protocol was negotiated the EU, supported by most of the countries with economies in transition, called for a reduction of the greenhouse gas emission by 15 per cent. That is the reason why I think the EU should feel like a leader in this process.

All the results that are presented in the two strategic visions, especially in the energy paper, are not completely realistic. I tried to compare your outcomes with some preliminary results that have been reached by the IPCC, especially in the Working Group III. I would like to compare your outcomes with the outcomes that are mentioned in the tables of the third chapter of the IPCC report. If I am not wrong in my calculations, the EU emissions for 1990 were about 1,200 million tons of carbon. If you reduce this amount of carbon by 2050 by 80 per cent we have to look for a reduction by almost 1,000 million tons. From your graph for the energy sector, the reduction for 2020 should be about 20-30 per cent, and we need to look for the reduction of about 450 million tons by 2020. And if I compare these values with the values in the IPCC report, the estimation for Annex I countries are, for example, for hydro 20 million tons, for wind 120 million tons, for biomass 80 million tons etc. If I count all these values together, we can reach a reduction of 250-260 million tons and are still about 200 million tons short.

I just compare your values with the ones from the IPCC report and that is for me the evidence that makes me realise that these outcomes are not really realistic. This is not only a problem for me, but also for the policy-makers and the decision-makers. From that point of view I would like to see some kind of calculations to improve the credibility of your report. I think you have made a very useful document, but for the credibility I think it will be necessary to make an attempt to link the outcomes from the COOL Europe project with the ones from the IPCC study.

Another comment concerns the growth rates mentioned in the energy document. I am not sure whether the trend in the annual increases of solar and wind, 8-10 per cent for 60 years in a row, can be reached. For example, for the economies in transition, these assumptions are really very high.

Also I would like to see in your final documents some estimation on costs and the feasibility and possibility to reach the 80 per cent target. Referring to the IPCC report, it includes tables with probabilities on reaching targets by 2020. It is divided into the following categories: very unlikely, unlikely, likely probable, highly probable. If I go to this IPCC table most of the activities mentioned in the COOL Europe documents would be categorised as very unlikely, unlikely and maybe possible.

To reach a higher level of credibility of these documents I would like to see some better explanations. It is very useful that the papers deal with the issue of EU enlargement. But what is missing, and now I would like to speak more or less on behalf of the accession countries, is aspects related to the social problems in our countries. (By the way, social problems will not only be related to the countries in transition, but also to the EU countries.) In transition countries the changes related to the closure of mines and energy price liberalisation will involve huge problems.

It seems to me that climate change policies must be co-ordinated with EU agricultural policy and EU forestry policy.

Lastly, let me once again underscore that I think the documents are very useful. It is necessary to think in a time horizon of 50-60 years.

Kevin Leydon

About a year ago I sold my shares in climate change. I think I made a deal: I can go in now and buy at bottom prices. If I stay out the market a little while longer I might even get a better price. This is one of the issues you have got: going uphill selling into a market that has probably peaked with Kyoto.

Now why is that? It is because of the magnitude of the decision taken at Kyoto. Kyoto was a strategic decision of enormous importance. Essentially what we said was: Thank you fossil fuels for giving us 200 years of economic growth. We are going out of that business. We are going to find something else, and it is going to take us little while to do that.

If I might just share with you a view to the future which is ten years old. We did this thing about ten years ago as we were looking to the strategic agenda emerging in the 1990s and as to where we were going. Basically what we tried to do was to look back to 1960 and walk into the future over a 60 years period. We were trying to figure out what the shape of the technology agenda would be over that period of time.

But what struck me was just how grinding the growth in energy consumption is. It is two per cent per year. It is a fairly steady growth. If you take a strategic view on it you do not even see the oil shocks of the 1970s and that sort of things. Now if you want to go towards the lower curve, what are you going to do? Basically you have to get your technology right, and you have approached that here. Technology forecasting is fairly complex. You can ask yourself what is scientifically possible over 50-60 years, and frankly there is no scientific gap to stop us going where we want to go. There is a technology gap, and there is an investment gap behind that technology, but scientifically it is doable, so that is the good news.

The bad news is that the real problem is coming from economic growth and population growth. You can discuss whether it is 12 billion, or 11 billion or 10 billion, but it surely is not 6 billion people that you are dealing with over that time horizon. So on the demand side we have got a fixed demand. If you look at the equity issues behind that: we are fairly fat energy consumers in this part of the world. But the average in the world is fairly low.

How do you get this in an equitable manner? This is not addressed in your paper. I do not criticise this, I just note that it is not addressed.

I would just draw two broad conclusions from that graph. First of all, it is taking us a lot longer to get on the right path than our enthusiastic policy chaps would have said ten years ago.

The energy efficiency drive, apart from its steady progress of increase, probably it is 2010-2015 before we really start moving up. Real breakthroughs on renewables is further down. That was where I was ten years ago. I got the feeling you are too optimistic in your time frames but I would agree with the direction you are going in.

The second message I would draw from this here, and something that is not covered in your paper, is the capital investment implicit in a renewables world, a hydrogen world: it is very capital intensive. Somebody has to start writing very big cheques to pay for all of this. Who has got that money? I leave you with some in mind, the people who own the present energy assets have that money, so they will have to come and get on board.

You have not tracked out the distribution costs. However, we go with new fuels, new alternatives, somebody has got to distribute them. This is not factored in. There is not enough economics in this.

As you know the Commission produced a paper on energy security and it crunched the numbers up to 2020-2030. Carbon intensity in the transport sector is predicted to be flat, no improvement. Energy intensity is predicted to improve by 1.3 per cent per year. That is fairly much the historic level, so no great surprises there, no breakthroughs factored into the conventional approach. Transport growth in both energy consumption and carbon dioxide emissions lays between 0.5 and 1 per cent, and the models give 0.7 per cent which is thus

nicely in between that. It is basically saying that transportation is going to grow and continue to grow.

In terms of what is implicit in your target there, if I take it and just net the numbers to 2030 and not 2050, and say you want a 50 per cent reduction there. You basically are talking about backing out 300 million tons out of this system. The incremental chain between 1990 and 2030 in our numbers is about 600 million and half of that is accounted by transport, so you are going to have to back out 300 million ton, against a growth rate of 40 per cent up to 2020. So basically you are going to have to do an awful load of work to get there.

On the behaviour side I am afraid you have got a black box. Everything is attributed to change of behaviour, and I agree entirely with you. But how do you make that happen? I miss some discussion of the factors on the demand side and what the driving forces are likely to be, and that is not there. So we are all saying if only somebody would change our behaviour, we could do a huge amount of things. But what we have to do is to understand the dynamics, so I am a little bit critical on that side there.

Let's see what the good news is. The good news is that it is technologically feasible. We need time. Do we have that time? My own personal feeling is we do have that time and therefore the message to the policy makers is: if you are moving, you can technological match the time horizon, but you will not get the short-term time horizons implicit in the Kyoto Protocol.

So to conclude, how to go forward? Do not get over-pessimistic about the results; any intellectual exercise like this will raise problems. I think what you have to focus on is implementation. There is a gap between ambition and actually getting out and doing something.

Anders Wijkman

First of all, I think that this is a very useful exercise. I have been involved in a lot of scenario building exercises in the past and have learned how useful they can be. I think this kind of exercise, backcasting, is even more useful. A few years ago we did something similar in connection with water scenarios in relation to the Stockholm International Water Institute, based on Malin Falkenmark's research, and that was also very useful. It told us what has to happen in order not to run into desperate water shortages in some parts of the world.

I think that the vision part is very important. We need visions. We even need dreams. I guess the difference between wishes and dreams is that wishes are intellectual constructions, whereas dreams are hopefully also based on the intellect but to some extent also on your heart. And probably we need to dream as well.

I think when this is going to be presented to a wider audience you have to get more in depth with regard to why you have chosen the 80 per cent reduction target. I agree with you in general terms about the equity issue. After my experience at COP-6 in The Hague I can tell you that the whole equity issue has not been debated at all. So just to present this as a sort of reasonable figure or goal is a bit simplistic, or a bit naïve I would say. I think that the whole equity issue and what the role and responsibility of Europe requires more thinking and more analysis.

We need a debate on options. Basically we deal with two parameters here: technology and behavioural patterns. I would say that the whole behaviour thing needs more analysis and research. I happen to know that there is very little research undertaken in this area. When I was a board member of a foundation in Sweden called Mistra, which deals with long-term environmental research we tried to put together long-term research projects on behaviour in relation to sustainable development. It was difficult to find researchers in Scandinavia. So the

first thing we had to do was to try to build capacity and to interest institutes in Scandinavia for this. I do not know where science is today but I believe this is still a problem. My perception is that although we all the time say: 'the young generation is going to do it, the young generation is going to behave differently', I am not so sure, not so sure at all. They are more conscious, they are more aware than we were at their age. But it does not necessary mean their behaviour is changing. It is one thing to say: yes, the environment is important. Another thing is to do something at the personal level. Without trying to be a technology freak, I have to draw the conclusion that the main area of hope or the main area of intervention probably has to be technology.

Like the previous speakers I do think that you are weak on economics. My perception, meeting a lot of congressmen from the US, parliamentarians from Australia, New Zealand, Canada while I was in The Hague, tells me that the number one issue for them is the economy. Their perception is that their economies are going to suffer. The Americans were arrogant, but they were also ignorant. It was quite striking; they told us: "you don't have Mexico at the other side of the border, they will steel all our jobs, you don't have the same number of people in car manufacturing, our industries will die." Then you point out that Paul Krugman and other economists have shown that the number of jobs have increased, not decreased, as a consequence of more open trade. But then they came up with the following counter argument. It might very well be that in the information technology area new jobs are created, but we lose jobs in our traditional manufacturing constituencies and that is what is important to us. I think we should deal more specifically with the economic arguments, both for the short term and the long term. Both what is required in the terms of investments and what is the short-term scenario in terms of costs etc. It is risky to start looking into documents like this, because you easily get bogged down by statistics and I do not want to do that, because I think it is the general approach that is most important.

I read in the energy document that the two future images are based on the assumption that energy intensity would diminish 2 per cent per year; 1.5 per cent as a consequence of energy efficiency improvements and only 0.5 per cent because of structural change. Where did you get that from? I am presently rapporteur for the energy efficiency action plan of the Commission. It is indeed a colossal task because the statistics are so contradictory. Depending on which report you study, from the Commission or from other institutions, you come across totally different figures. For instance, in the energy efficiency action plan of the Commission there is nothing positive happening a consequence of structural change. When I go into statistics my impression is that during the 1990s, structural change led to 1 per cent yearly in energy intensity reduction. But that just shows you that this is a morass and if you believe, like you do in both the transport and energy visions, that the information economy will move things in the right direction, through de-materialisation, well this figure must be too low. The structural changes would bring about a much more efficient economy. So I think you have to do some careful analysis here, and I think that this is a colossal task for the researchers to try to understand whether there is really a synergy between the information economy and sustainability.

A year ago I was addressing this issue saying: 'yes, IT is the hope'. Today I am not so sure anymore. The information economy could be just an add-on. If you take certain parts of it, like e-commerce, it has led to a huge increase of transports, not a decrease. Perhaps, when volumes are sufficiently high, that logistics and transport management, freight transport and so on will become more efficient. But there is no free lunch here, and I think we have to understand this much better.

Regarding your energy scenario: you have not convinced me that the biomass vision really works. I would like to see more about the energy efficiency when you turn crops into fuels, etc. All the research I have seen tells me that this is not very efficient from an energy point of view. You deal very little with that. Secondly, you indicate that there will be no competition

for land. Unlike many other experts I do not think that Europe will be a food importer in the future when trade barriers are gone. I think it will be a food exporter because there is simply not enough water in certain parts of the so-called developing world. It is not land that is the scarce resource there, it is fresh water. If that is true, can you really achieve what you project in terms of biomass for energy?

I think you should expand on the learning curve issue. When you increase capacity in new technology areas, every time you double capacity prices go down by 10-15 per cent. If that is true, why can we not have something like the Manhattan Project or the Apollo Project, maybe by the US and the EU, just forcing prices down in some of these technology areas. It would be very interesting if you could add that. If that was possible in the 1940s, 1950s and 1960s - why should it not be possible today? Another possibility is aggressive public procurement activities in some appliance and equipment areas.

Moreover, I think you deal too little with the so-called rebound effect. That is by the way one of the criticisms I have toward the Business Council on Sustainable Development. They talk a lot about eco-efficiency but they pay very little attention to how the saved money will be spent. My impression is that when we save energy there is a tendency to demand more energy in other areas.

I agree with everything that has been said about the accession countries. I think the food production-energy production link is very important. Perhaps the solution could be that you do both at the same time. Then the economic situation is probably going to improve.

Last but not least I think that the north-south dimension, apart from the equity issue, should be brought in more fully. I just give you one example on how we run things today. I came across some statistics showing that presently through our export credit agencies and development banks, we spend colossal amounts of money, billions and billions of dollars every year, supporting fossil fuels production and fossil fuels investments. Roughly 50 per cent of what the export credit agencies do is related to fossil fuels.

In Europe there is no effort whatsoever to try to increase efficiency and at least try to go for the best possible technology. This is just one example where our policies are totally out of place with our rhetoric. What is needed is environmental guidelines for investments and guarantees supported by export credit agencies.

You could also strengthen your comments on the EU policy making in this field, because we do not have a European energy policy, we have a very erratic policy making process here. Basically because Member States do not want to give more responsibility to Brussels. This is of course one of the very weak points. Unless we pull that together there is no way we are going to achieve this. What happens in Nice today and tomorrow is particularly interesting from this point of view. If my government and the British and the Spanish governments continue to oppose a carbon dioxide tax this mission is not going to happen.

Kevin Leydon

I think we share the same view. If you go forward the shaping factors, even demographic studies is already very complex. All I think you can do is to follow the different strategies or different scenarios and try to work it out. How do you factor in the short-term effects on weather changes over the next 50 years?

Look at the numbers that came out just before The Hague; we are talking about serious heat or drought in the southern part of the European continent. If that is so, can you imagine the pressure that is going to come from the southern side of the Mediterranean basin and the migration pressures we are going to come under? Can you match that with the ageing

population of our countries? All of these factors are actually playing out, or will play out in the future.

Somebody has got to do this thinking. How do we get forward encouraging politicians to actually start implementing policies that need to be done? How do you get city politicians to take some of the hard decisions that are necessary in the short term? Because in the long term these are the types of things you will need. So I am a bit pessimistic that we can actually do more than search for the dynamics.

I do not think we have an information gap at the moment. I think we have an implementation gap. Let us focus up-front on implementation.

To whom are you addressing the strategic visions? Are you addressing it to the people who are advising the politicians, or are you addressing the politicians? I suspect, or I know, that these are two different markets. If you want to get to the politician you have to give him some information, but you also have to build confidence.

Anders Wijkman

I think the difficult thing all the time is to make use of the research reports in a constructive way. There is so much research going on in relation to, for instance, the regional impacts of climate change or in relation to carbon sinks. When I was in The Hague, the EU presented stunning results in relation to a study on carbon sinks. I did not know before that the probability is large that forests in this part of the world, which today obviously assimilate carbon, will probably within forty or fifty years turn from sinks into sources. Have you seen that in the media? Have you seen that as a counter argument to the US, to the Australians and the Canadians when they want to make unconstrained use of sinks? Whenever I tell people about this they respond: I did not know that. So we have a colossal task here.

There is information, there are a lot of facts available, but they do not necessarily form opinions. We have to distinguish between facts and opinions; opinions are not based on facts. So this is to me a very crucial thing. And being again, after many years, a politician, I can just tell you the amount of information that you are exposed to as a politician is colossal. If you want to come across with something, and really make an impact, you have to be very careful in how you present it. One of the problems with this kind of reporting is that there can be too many details. You do not remember what you have read. So you have to be very concise in presenting the things.

Regarding the relationship with the accession countries; there is now a window of opportunity to help them invest in the right kind of systems. We are presently exporting unsustainable production and consumption systems to the developing countries. The CDM might offer an opportunity to correct that, depending on how the rules of the game will be played out, but we do not know that yet.

I would urge us to do better with the money we already spend, and this involves also the private sector. I think you should pay tribute to that part of the private sector that is taking this problem serious, and maybe have a dialogue with them. Some of them are around the table today. This should be reflected in the report, because they could be very important players in the global arena.

Jan Corfee-Morlot

One of the questions that came in mind while reading these papers on what Europe could do for itself to achieve radical reductions in greenhouse gas emissions was: how could the politicians of Europe be motivated to make the policies to bring this type of change about?

The business community is interested. But they are clearly not going to do it on their own. There is too much inertia in the present investment policies so the question is really: how can you find the motivation for Europe to move on its own, without a framework that actually starts to move the rest of the world in a similar direction?

I think that is what the debate in The Hague was all about. The equity questions come back in. There is clearly a much more complex equity issue when you start to extend mitigation obligations beyond the OECD countries or beyond the Annex I group.

I have not followed the global COOL dialogue much but I have heard some echoes from the people who have been in it that there are some interesting ideas there. It would be interesting to try to map what your solutions are or what your concepts and recommendations are. In the end the motivation for your politicians will have to be linked to the whole public perception and the whole private sector perception, that we are moving on this pathway together.

Greening of the investment regimes is a point that is largely overlooked. The OECD drives many of these investment regimes. We run the export credit group, but it is barely on the agenda. Climate change is one of those concrete issues where you can start to say: yes, we are interested in environmental guidelines. We are not just interested in the guidelines, we are interested to see them implemented, and to monitor progress, and to report back on how well we are doing. It is not just vaguely environmental guidelines, it is greenhouse gas emission reductions. So you have to look at ways to actually make these communities accountable over time.

The appropriate institutions exist. It is not a question of creating new institutions, it is about integrating this issue into the existing institutional infrastructure.

Representative of the transport group

You mentioned that 80 per cent reduction as a target for the transport sector may not be useful from an economic efficiency perspective. Generally speaking I would agree to that. But I would emphasise that the more you approach a 100 per cent overall emission reduction target, the less the remaining flexibility will be. It may strengthen the transport document if we can show what zero reduction of emissions in the transport sector would imply for the other sectors. It is always easy to say that economic efficiency may hint to a different direction. If we put forward this argument the sectors will immediately start arguing: 'it is not us to do all the work that is necessary, let the other ones do it'. Therefore if we try to take a clear picture on what the remaining flexibility with 80 per cent overall emission reduction is, then we will find that the flexibility is not that enormous. This does not mean that there is no flexibility. We may demonstrate that with a figure or something like that in the paper to get a clearer view on that.

Representative of the energy group

Has the climate change issue peaked? I very much doubt it. We see a very much solidifying science base behind our understanding of climate change. Greater public awareness of that issue and the ancillary benefits that Jan referred to are also becoming more and more clear. I think this is probably going to be the main driver of climate change policy. In realising how those ancillary benefits manifest themselves, it is important to bear in mind that there is a tendency implicitly to show a business-as-usual forecast or a trend forecast, and to regard that implicitly as a sort of economic optimum. Any deviation from that is in some ways seen as a cost, and yet of course it is a business-as-usual forecast based on a market that is saturated in subsidies, in perverse incentives, in market distortions of all kinds. So in fact diverging from that is quite often a cost reduction, not a cost. Specifically you referred to the large capital investment that is going to be required in transmission, and where this is going to come from.

It strikes me that perhaps ten years ago we could have had the same discussion about the telecom industry. What could be less likely than that fresh capital was going to be invested into such a dull industry, which is basically just a bunch of wires owned by natural monopolists. Now we have billions of dollars being spent on investing in mobile licences. If we are trying to look ten years ahead and identify where the capital spending is coming from we are not necessarily just looking at large energy incumbents or the whole thing being unfeasible. Quite apart from the fact that we are spending enormous on distribution infrastructure right now, a lot of structural funds spending goes into the trans-European networks, into electricity rings around the Mediterranean Sea, to gas links with Algeria and so forth. So what we are talking about is not creating a new energy infrastructure where there is none, but in part at least diverting existing investments.

I want to reinforce one of the points on the developing country participation. When we talk about the kinds of volumes, markets, renewables, and so forth, we need to bear in mind that we are spending literally tens of billions of dollars a year, undermining those markets. Not only in the developed countries but also in the developing world. It is estimated that the last five years of World Bank projects during their lifetime will emit more greenhouse gases than the planet emitted in 1997.

Kevin Leydon

I think the market for climate will grow. I will buy in by 2003-2004, that is my projection now. It will come back, it is not off the agenda, that was not my message. My point was just simply that all of the inherent problems of the Kyoto Protocol are going to take longer to unravel than we had imagined. Particularly anyone who sat in on the Buenos Aires meeting could not be anything other than pessimistic. But more importantly we have to focus now on how to match these agendas. Let me just give you an example. If you are talking about climate change and you are looking at urban transport problems, what is the match with congestion? If you want a programme that addresses congestion, which is a here and now problem, and a problem that is going to deteriorate over the next five to ten years, then you have an agenda which is very similar to the climate change agenda. So instead of focusing on climate change, on which we can take a view whether this is a driving force at the moment or not, I am a little bit pessimistic that it is not a driving force now. But congestion is a driving force. So therefore try to link at each point in time something that has an agenda point now, which has a constituency that wants to address it. When you want to address congestion, you are talking about changes in behaviour. That is a here and now job. The good news is you can actually deal with it, the politicians want to address it, but it is very sensitive politically. So that is the good news: try to get back to something that has a here and now policy link, that is my advice.

The perverse subsidies: I leave that for a moment. Let's talk about the technology boost in the telecom business. It is going on at a 35-45 per cent turnover per year. I do not know any energy sector that is yielding anything more than 3-5 per cent per year. It is a different world. So I do not think you are going to see someday or another Electricite de France going into 30 per cent turnover per year. But what is true is that the whole question of technology development and I think we are being pessimistic about that too much.

We do not understand the dynamics of society. I have published forecasts stating that 1990-2000 there will be a 40 per cent increase in the carbon dioxide emissions. They got it wrong, absolutely wrong. Each year since then we found that we were reducing our forecast. Today we are lower in the European Union on carbon dioxide output than we were in 1990. Why? No one really knows. We have to try to understand the dynamics of society, because our statistical systems are not sophisticated enough to capture this. So if you make a forecast, you tend to be pessimistic. I would come back here now and say: get an agenda that is matching a

short/medium-term political agenda with a long-term climate change agenda, and focus then on implementation.

Representative of the transport group

I wanted to comment on an issue that was discussed a couple of minutes ago, where we spoke about the global EU climate change policies. I see that a very important and crucial issue for the further development of the EU policy is to renew and to improve the discussion and dialogue between the EU countries and the accession countries. I see this as really very important because in our countries there is quite a lot of opportunities for emission reduction. Of course such a dialogue has already started. But the dialogues that were arranged in The Hague were sometimes really disappointing. I think it is necessary to significantly improve this dialogue on the principle of balanced dialogue.

Anders Wijkman

Two brief comments with regard to EU and accession countries and the EU and developing countries. Kevin Leydon mentioned congestion. It could be a driving force for change. The same applies to developing countries. If you come to a developing country and tell them to do something about climate change, they will look at you and say: 'come back tomorrow, we have other problems to solve'. It is much better to say like this: 'look, you need modern energy carriers, sophisticated energy services for all those people who are without electricity or where you have extreme shortages, etc.' Then you have another type of discussion.

Since we have a totally new situation today with technology options that did not exist 5-10 years ago (and even more can be expected in the near future) it should be possible through an intelligent combination of partnerships with the private sector to use development co-operation money and soft loans from the major financing institutions, like the World Bank, more cleverly. We are talking about tens of billions of dollars yearly that could be spent in a different way. This has been totally overlooked, it is not a priority. I remember when I worked at the UN, I was responsible for policy at UNDP, and I had the Swedish energy expert Thomas Johansson as one of my closest advisors. We presented a report that made the point that energy is a very critical tool for poverty reduction. We organised a seminar, but people like gender specialists, social development specialists, poverty reduction specialists did not show up. Why? They said that energy is an issue that has nothing to do with their fields of activity. I think we can be more intelligent and more pragmatic in our approach, and this is a major issue in terms of the global responsibilities.

Last but not least, one reason why the discussion is so limited between the EU and the accession countries is precisely because energy is not part of the Treaty. It is practically not part of the so-called *acquis*. I once asked Commissioner Fishler: "What are you doing to do to promote that some of the farm land that may be abandoned, in Poland for example, can be used for energy production?". His answer was: 'It is a good idea but we are not discussing that because it is not part of the agenda.' Energy policy making outside the main responsibility of the EU is a disaster.

Representative of the energy group

I am very interested in the comments that were made on the implementation gap. I wonder whether it is a matter of an implementation will as well. In most political spheres the future vision is no more than three or four years because that is when the politicians are back to the next election. The issues that we are dealing with are on a 50 years horizon. So it is easy to argue that on energy policy we need to have a long-term vision but we actually have changed the political debate to focus on short-term agendas. You move from a policy analysis role into an implementation analysis role. What do you think we should do to bridge that gap? I think it

is absolutely fundamental that the sooner we start the better. So getting things like renewable energy directive in place is quite an important catalytic change. What should we be doing?

Marcel Kok

I also want to address this implementation challenge. Within the COOL national dialogue on transport it has been very clear that a lot will have to be dealt with at the EU level. All participants agreed that there is currently a lack of coherence in the EU climate transport policies. They mentioned three things: (1) pricing and the inclusion of external costs, (2) the development of new transport systems and (3) prospects for long-term standard settings for the promotion of climate neutral technologies. Which role should the EU play here?

Representative of the energy group

I think this exercise is very useful for the vision you try to develop, at least for the policy makers. It will take them away from the short-term ideas of the Kyoto Protocol. Recently the Commission has embarked on two major exercises. At the political level there is a process on sustainable development and governance. I wonder what it gives if we try to see climate change problems, not in the context of the environmental policies, but through the sustainable development policies. It will help us to see these kinds of complexities between agriculture and energy, EU and developing countries, industrial interest and industrial opportunities, and at the end the role of the institutions. I am not completely convinced that current institutions are conducive to sustainable development. Not so much in the EU but more at the international level. We have to look at this.

Kevin Leydon

I have spent fifteen years in transport and about twenty years in energy. Last year the Commission merged transport and energy, and I got the offer to take up urban transport policy. Why should the European Commission be involved in urban transport - have you not heard about subsidiary? The answer to that question is: every city, whether you start in Dublin, Athens, Helsinki or Lisbon, or across the Mediterranean basin, is concerned with urban transportation. So the first thing we are going to do is to try to get a debate going on the agenda, the urban transport agenda.

The politicians have a three to four year long time horizon. But they are concerned and want to know how to move forward. You need to shake the agenda, and I hope we in our Green Paper are going to shake the agenda. It is a political paper, addressed to the politicians, not to the research world.

The second point is that you need an instrument to do that, you need money. We have put together 50 million Euro and we have just announced a programme which looks for five to six leading cities in the European Union, matched with five or six cities in the associated countries. We want to present an integrated radical programme addressing the urban situation.

We want to create a critical mass with politicians in the lead, not consultants, not research institutes, to address these issues. We are trying to build momentum, and shape the agenda, but also send out a message that there are people addressing each of these issues in very practical terms.

The other area that we are working on is to address urban transport, public transport. The major players if you want to move away from the car. Our primary concern is the use of the car.

We have to change the use of car in the city and at that point in time you meet the political situation. We have to look at several instruments. Standards do work, so I think the politicians should begin to set standards. The car industry will protest but we can find a way out. I think it is underestimated what we can achieve with technology, we are always behind with ourselves. We have to try to penetrate the clean cars into the market much quicker. So you are into behaviour, and you are into physical situations, from the technology side.

Politicians are going to be really careful about pricing, but we have to address this. That is why in the Civitas programme we are working with cities who are trying to address it. So I conclude that dialogue, working with politicians and creating a momentum is important.

The intellectual work that you have done is an inspiration to us. You need this injection of long-term strategic thinking. But it has to be translated back in programmes. Research work is important but that is not were the urgency is.

The green paper, research money and addressing legislatively public transport reform and restructuring. These are three instruments we are using now to try to get the implementation phase going.

Anders Wijkman

In my opinion we have political problems in applying economic instruments. We also have increasingly, in parts of our societies, a situation where the price elasticity is very low. Even when you raise prices for certain groups of individuals they do not care. They just pay, because incomes have increased sharply for certain groups. This is also an equity issue. You have the bizarre situation now in my own country, Sweden, that the moderates (the conservative party), who usually have not cared much about the poor, they are the ones in the debate about economic instruments and transportation, who say: 'the poorer section of the population cannot survive'.

This whole question of economic instruments versus mandatory standards and maybe also voluntary agreements is a very tricky issue and we need more discussion on it. There is no thumb rule - I think for each situation we have to apply the best possible instrument.

I believe a lot in research, but my impression is that the European Union, because of shortage of staff, has not enough money to really make serious follow-ups. I have participated in several very good seminars on public transportation, on clean fuels etc. But where is the follow-up? How do you share the knowledge about best practices? How do you turn these research results into policy making? I see a great gap there.

I think the comment about governance is extremely important. We have a tendency now, at the international level, to say all the time that the WTO is undemocratic, let's move to the UN. I have spent three years at the UN, at a very senior position. I left it because I felt not only that it is a slow and bureaucratic organisation, but that change is almost impossible. If you believe the UN could solve these problems in a better way, you are just naïve.

We need to reform the global institutions or we need to create new ones. Probably we have to create new ones, because there is some kind of inertia built into the walls of the existing institutions. The governance issue is very important and you have not dealt with that.

I should also encourage you to read some of the books and literature by a man called Orio Diarinie, a member of the Club of Rome. He has dealt with the emerging service economy. Both the Wuppertal Institute and the Factor 10 Club have been looking into what would it mean if we as individuals were more interested in the functions of products than in owning the products. The consequences of leasing and hiring things instead of owning them would be quite dramatic from the point of view of energy and resource efficiency. I know there are

strong cultural and behavioural aspects here, and a lot of resistance, but I think you should give it a bit more reflection. It represents a very interesting alternative. It offers comfort and service but it is organised in a different way. It would increase, not decrease, employment.

Representative of the transport group

In my country biomass has started to be discussed by especially local communities and local businesses. Of course it is at a small scale. But I am very afraid that, because the political process takes place very slowly, that soon there will be some conflict. People will recognise that there is no political framework to make the changes. I think that we need to address this in our paper.

The ISPA fund for the accession countries in Central and Eastern Europe spends part of its money for environmental purposes, for waste water treatment facilities etc. But when we ask for a part of this money to be used for saving the water nobody wants to discuss this. In some cities you can save 30 to 40 per cent of the water.

The last point I want to raise relates to what was said about congestion as some kind of good slogan for politicians. What I discuss quite often in Poland is the issue of job creation. The countries in transition are losing jobs in heavy industry. If we have no alternatives for these people there will be a strong political opposition against these changes. If we sell it by using the slogan 'we can create green jobs for people who lost their jobs in the heavy industry', then we can discuss with many people. That I think is one way to attract the politicians.

Representative of the energy group

I come back to what I said before about implementation and the dynamics in the European Union. All EU Member States agree that the new energy sources are extremely good. But they will not even accept indicative targets. It took an enormous amount of political negotiations to get the indicative targets through. You see exactly the same thing on energy efficiency. Energy efficiency is inherently sensible, it is economically sensible, it is socially sensible. Yet the moment you start to talk about some way of measuring progress, they all turn back and say 'we don't want that'. So I come back to what I said: you cannot see the will to implement it. A dialogue might get you some way down that route, but somehow in this process if we are really going to deliver what needs to happen we have to get out of the mindset of what appears to be very short-term self interest.

Kevin Leydon

I had some visitors from Stockholm. In the city council of Stockholm traffic is a political game between the different parties. Somebody will be in power, or not in power, depending on whether they touch the right buttons on transportation and traffic problems. This is part of the normal political life.

The great problem in transportation is the asymmetry between the transportation problem as such and the transportation dynamics as such and the administrative and political system. Those of you who live in Brussels know this very clearly: 19 communes, can they agree? Yes but reluctantly. Who do you deal with if you want to do the most simple things like traffic or road pricing? This is the challenge. We need to make things actually happen.

Let us be very clear: at the moment there is nothing more political than transportation. Closely followed by energy. I thought that energy was political, but transportation is really political. You are dealing with day to day things, but that should not stop us. That is why the Commission has, rightly or wrongly, decided to deal with urban transport. Not because we know the right answers, but because we want to facilitate this debate and to give some momentum to change.

Tomas Kåberger

When you say it is political, what exactly is the problem of an issue being political?

Kevin Leydon

It is that there are genuinely different views, and the political systems we have in each country, have a view on transportation and have an interest in transportation. This is over and above the actors. The public utility operator has a relationship with his city, the freight man has a relationship with his city.

Anders Wijkman

The government system was already touched upon. The political party structure is quite old fashioned. The political parties were formed during the early industrial age, when the main division was between labour and capital. Now this main division is not at all there. Then these parties try to take on these issues that have to do with the future but they do not have a good analysed agenda. There are very few of these people who have sufficient knowledge about the issues. They rely on the tradition and ideological patterns such as the freedom versus collectivism.

Transportation and mobility is looked upon as freedom. People want their bloody cars, and they want to move around exactly when it is convenient to them, and they don't want to be penalised by charges at peak-hours, etc. The public at large is rather negative to charges, taxes and fees. Intellectually they may agree with you that something has to be done, but they do not want it imposed upon them. We have the whole problem of short-term legislative periods and strong lobbyists. It is only a few years ago that the coalition of car manufacturers, road constructors and energy companies dominated 30-40 per cent of our economies. When they said no, it was no. So we are up against very strong interests and opposition parties. I still think that many people perceive that there is an inherent conflict between economic well-being and environmental protection. I may sound pessimistic but we have to nail down what is really the problem.

Jan Corfee-Morlot

I think Anders is right on target. Part of the problem is that we as environmental community are here because we want to think about the future and think about how an environmental sound future can come about. We have not been able to make the convincing argument that these current indicators of economic progress are failing us. We have not been able to say: yes, we can measure the growth of our economies in dollar value but have not taken into account some of the changes in quality of life that urban congestion has brought about. And loss of human lives, and sickness in our families because of air pollution, and no more places to walk or be quiet, to find a quiet peaceful place.

You can think about how to come up with quantitative indicators for the long-term side-effects of GDP growth to tell us how we are doing. This is why I think that no matter what, the policy coherency agenda is really the top one of the greenhouse gas question. Start to take existing policies, turn them inside out and ask: what does this mean for climate policy? You are never going to get the long-term on the agenda in another way.

Subsidy reform is one of the top ones that is extremely complicated from a constituency point of view. The reason that subsidies exist was to satisfy the existing constituencies, whether it was a coal-mining community etc. Many governments thought they were picking winners

when they subsidised coal. They thought they were picking winners subsidising nuclear power. But look where we are.

In some ways I found in the document too much of a tendency to go to what we know is right for the future. We do not know. The point is to move to policy instruments that provide incentives for these targets. We cannot provide the quantified targets. You need political will, yes, but you need huge amounts of flexibility to allow the business communities to adapt and the investments to come along in a rational way. You have to work with the economic dimension much more if you are going to make convincing arguments.

Kevin Leydon

I just look at a country like Ireland that was a poor country 30 years ago, but now is a leading country with growth rates of 8-9 per cent per year. To stay in this game they have to increase education and bring more people into third level education. But the real constraints on growth and wealth are housing, land use and transportation. These are fundamental issues that are restraining their growth and putting their prosperity in peril.

It is in fact the lower income groups that are more car-gearred in Ireland, simply because the jobs are scattered around. The lower income groups live in the peripheries of the urban areas, they have got to move. The amount of inertia in the system and the difficulties in addressing these issues are major problems of governance. This is where we have to understand much better the social dynamics of our societies. This has to be filtered into the type of work that we are doing around the table here. Even if you cannot bring it in to 50 years forward, just try to understand today what the social dynamics are.

In transportation and in energy, we have done the easy things, we are now going to do the hard things. And therefore I am a pessimistic optimist.

Final round: discussion about the usefulness of the COOL Europe process

Anders Wijkman

All the four of us have said that we feel that this is a very useful process. Focus on a few things including the economic and social dimensions and present something convincing there. Literary say, 'it will not cost us much, and in the long-term perspective we will all be better off'. I think that could be tremendously important. Particularly if you can show that there is a sort of possibility to go step by step about it. And that nothing has to happen overnight, but if you take a long-term perspective you threat very few immediately. I think that is the beauty of the whole exercise. I believe very strongly in it and I would be happy if we could have something of a presentation in the European Parliament.

Jan Corfee-Morlot

I also agree with the general statement that it is a useful process. The real question is what you can do with your product.

I think the key here is on connecting climate to other priorities; policy priorities, investment priorities, that are at this moment completely unrelated to climate. I would really like to see those connections brought out before you get into communication. In Europe you can address local audiences, local governments and local community meetings. Communicate with people on the street, people who vote for politicians.

This is the type of tool that is useful now. There was a huge amount of press in The Hague. Some recent science press is very convincing, combined with the extreme weather events that we have seen in Europe. That is a window of opportunity. People are attuned to this issue now. I get many more questions from people who know nothing about this issue in the recent weeks coming out of The Hague. You have this opportunity now, it is really the question now. Try to make your message clear and short. For me one of the main messages here is that the technological possibilities are there, it is really a question of starting to push for those, through the different instruments that we have. In order for the politicians to be able to do that it will need the support of the people.

Kevin Leydon

I would like to pick up on the people part. What interests me is that by 2050 I am not going to be around, but my children and my grandchildren. Therefore 2050 is not an abstract number for me. I know people who will be there, and I think in reaching out for that, what we are trying to do is to shape their future. Therefore it makes clear why 50 years is a necessary time horizon because you are actually talking to people who either will be there, the younger generation, or people whose children will be there. So I would go along with this to try to link this back from the abstract, which is the job that analyst has to do, and try to hang this on the coat of where your youngest son or eldest son will be in that world. Are we going to give them a better world?

Jan Pretel

If I analyse this COOL process in a broader context (when I speak of a broader context I mean the medium and long-term perspectives) it seems to me that this project is a really good challenge for the future research agenda. It can also be useful for the improvement of public awareness, which is one of the most important issues. There is another challenge in setting the policy priorities of the local, regional government levels. It seems to me that continuing the process would be really useful, not only from the context of EU policy, but from the context of European policy.

Part III Afternoon sessions

3.1 Energy group

3.1.1 The role of the private sector

The group concluded that there is a need for transparency and consistency in the policy context so that investment decisions can be made and business cycles can be analysed with some degree of confidence as to what the regulatory framework is going to be like.

It is critically important that those companies that are taking voluntary early action on reducing their emissions are not penalised of subsequent rounds of legislation. It is extremely important to have an engagement between the private sector and the public sector to make sure that does not prove to be the case.

There is a general awareness in the private sector that the carbon constraint is coming. Whether The Hague stands or falls, something is going to be happening that is going to cause companies to think in a carbon constraint way. One of those key things for industry to do is to try and stay one step ahead of that. That is where a lot the proactive company policies are coming from. One of the crucial issues that was highlighted several times is the question of customer engagement. A lot of the right signals will have to be coming from the consumer. However, this is not actually one way of signals as it sounds. There are big marketing and advertising budgets out there which tell us that in fact companies have a very positive engagement in trying to shape the views of their customers. The role of the private sector in educating and increasing awareness of this issues was underlined a couple of times.

There is a general feeling that environmental profile of a company is going to be one of the competitive differentiators between companies in several industries in the years to come. That itself is going to be a driver of company action. That may take a number of forms but one that was highlighted was the sort of corporate social responsibility and the use of environmental reporting in order to make environmental performance transparent.

The importance of industry gurus in this respect was highlighted. Companies, especially large ones, can be held up as examples of a good practice in this regard.

Finally, industry can and should take a much more proactive and positive role in lobbying within the policy context. What we have seen progressively over the last few years is a slow collapse of the old guard lobbying forces in industry. A classic example is the GCC – Global Climate Coalition – which through the death of a number of big cuts has effectively been removed. Even three years ago, prior to Kyoto, it was perhaps the single most influential political force in the whole of the climate debate. Now what we are seeing is companies trying to be more actively engaged in policy shaping rather than policy blocking. That is very important. However, it has not (a) gone far enough and (b) really spread a lot outside western Europe. We are still seeing other parts of the world where that kind of action is much less pronounced.

We tend to concentrate only on the rich part of Europe and we tend to forget the rest of Europe. We know very little about the incentives for the private sector in Central and Eastern Europe. However, to a certain extent some of the same things will apply in both western and Eastern Europe. More and more, everybody is going to be exposed to that same framework across Europe as accession continues.

A central question is how the private sector can use this kind of analysis. One possibility is that it does by giving some kind of an analysis of where the framework might be in the coming decades. It actually does provide valuable input in terms of making those second guess strategic decisions that companies are bound to make. So over very long investment cycles, we are looking at the kinds of businesses to invest in. This kind of study can give you a bit more of a flavour of where those movements might be.

3.1.2 The role of the public sector

The 80 per cent target

Several participants reacted negatively to the proposal in the draft strategic vision that the EU should adopt an 80 per cent reduction target for 2050. One participant said that "I was a little bit surprised also by the way the sentence was phrased. In fact, our exercise took as an assumption that we were working on this target. Let's take this target and look how we can go up to this target in 2050. We have not discussed the scientific basis to choose this target which is corresponding to more or less 550 ppm in the atmosphere. If the EU adopts the 80 per cent target then we could say those countries that are willing to join could set up a club of people. I do not think that we have worked really, in the framework of this exercise, on the scientific basis to adopt this target or another target." It was concluded that the 80 per cent reduction target for the EU is an extraordinarily radical position if it is unilateral.

Another participant said that if anything is to be done on this point we could suggest that a target should be adopted without proposing a specific figure. He emphasized that all the ideas which are in the strategic vision document are based on the fact that if we assume that there is a carbon dioxide problem these are the actions to be taken. We have all participated under that precondition. This precondition needs to be mentioned. It has to be clear.

It was also pointed out that it should just be stated that the basis for this exercise was the assumption that climate change is a serious problem and to address this serious problem over the long term you need radical reduction in emissions. For working purposes the 80 per cent target was used.

Contracts between farmers and biomass-fuelled plants

In the draft strategic vision it is mentioned that guaranteed supply contracts between farmers and biomass-fuelled plants would be beneficial for the biomass option. This proposal caused some confusion in the group. "You have two parties in the market that are doing a deal. Is the government making that deal? What is actually thought of here? Are there some kind of guarantees involved? I do not understand that. If one supports that in order to reduce the risk for the supply side, then there will be longer term contracts. Is it perhaps about finding a solution as regards how to support the establishment of these kind of contracts?"

Support to wind power

Regarding support to wind power one of the stakeholders explained that his company is in favour of wind mills but has decided to abstain from going into large-scale operations in wind power. "We considered it better to support small producers by offering them long-term contracts. On a commercial basis we said that we would like to promote their development and therefore we support them with long-term contracts as a commercial player. In this way they could do the investments and feel secure of their money, revenues and so on."

Demand side issues

Another comment related to a proposal in the draft strategic concerning an appropriate regulatory framework for the liberalisation in the energy sector. This proposal needs

clarification. It is about an environmental regulatory framework, or an environmental framework, it does not have to be regulatory. An environmental legislative framework for the liberalised energy markets. Otherwise perverse things can happen to the environment in an liberalised market. Efficiency is part of the story but it is not the only part.

Internalisation of external costs

The next issue on the agenda was the proposal in the draft strategic vision that: "The EU should introduce a carbon dioxide tax. The sinking electricity costs in some countries in Europe is a window of opportunity to do this."

One could discuss the first sentence; is the tax the most appropriate instrument? Or should one use a fee instead? You can also use carbon dioxide certificates. Because if everyone is included in the system the result will be the same. What is important is that most of these things – the construction of a tax or a fee, and especially the carbon dioxide certificates – have to be created in a way that they will influence the pricing mechanism in the electricity market. They will only do so if they will be regarded as a variable cost, that is, to be changed with the marginal costs of the producer. If it is not, if it will be seen as a fixed cost. If it is a tax based on the emissions or the fuel it will work perfectly.

Regarding carbon dioxide certificates (for emission trading) it was argued that wrongly designed they will not have the price effect and thereby not having the customers into the solution. One participants said: "I like the tax more than the carbon dioxide certificates even though it is much more problematic in political sense. The tax is much more efficient to get the customers is. Because the customers will then see the price of carbon dioxide. They will not see the cost if you do this wrong. Then you will increase the demand for politicians to go in and tax finance demand side activities."

Emissions trading has to be created in the right way. The following example was given by one participant. "You get a reduction target and you reduce total emissions constantly which will increase the price on carbon dioxide certificates. But if this is not seen as a variable cost for me as a producer I will not take this into account when I am deciding whether to produce or not to produce. If I do not take that into account I will not factor the spot market which will be the pricing mechanism in the European market as well. So the price will be too low. We will have a tax at the bottom but it will not affect the price level. That means that you will not find the most cost-effective solutions in reaching that goal because the customers are not involved in the solution. I want to have the customers in the solution. A tax brings in the customers into the solution."

In reaction to this statement the following dialogue ensued:

- There is something interesting in seeing that European electricity companies do not understand how pricing electricity in a deregulated market will work. It is a pity to create a system that does not take into account how it works. The pricing level will be set by the spotmarket.
- If they are in an emissions trading system, the utilities will have to report the costs somewhere. They will report of the end on the spot market. You will not have only a spot market but you will have a future market also.
- Yes. But the thing is: if this market works, that is, if the competition authorities do what they should be doing, the spot market will be the reference market for contracts. Why should I buy a one year contract which is one pfennig higher than the spotmarket? I will not, it will

collapse. And the understanding of how this market works is very low. I am afraid that the policy measures which are taken now are based on the historical knowledge how these markets work, not how they will work in the future.

- That is what some of the pilot programmes set up by governments, working with companies, address.

- Many of the companies included do not know how this actually works.

- I do not agree. We have many experiences where we have set up virtual emissions trading schemes with many electricity companies. We have created a spot market, a future market for electricity for carbon dioxide certificates. And it works.

- What I say is from the experience of being (a) one of the largest producers in the Nordic market and (b) having been one of the largest buyers of electricity and gas in Europe as well. I have been buying from you. My previous company was one of the two companies who made the first external delivery in France. I have a good understanding of where the thinking is in most of the European power companies.

It was suggested to add something on carbon dioxide certificates and change the tax to a fee. Fee is better because tax is a fiscal instrument while fee can be earmarked to finance something.

One participant pointed out that there is not sufficient analysis to have concrete recommendations of one type of policy or another. "Rather you have sensed that you should adopt market policies to create and use markets. You can get these taxes, fees and carbon dioxide certificates permits, you can also mention subsidy reform as market instruments. A carbon dioxide tax is not a new topic. So you need to think about: is that the only avenue to get this? It does not matter so much which exact instrument you choose."

The chairman said that we could make a broad general statement and give some ways of dealing with that and then we could annex the controversy and provide an explanation for that.

Decentralised decisions

One participant argued that we have a decentralised search for the right solutions. "To use decentralised decision systems means to change the way of addressing the problems. This is something we discussed quite a lot in the second COOL Europe workshop. This is a major shift in thinking. One part is the single thing of enterprising mechanisms of the deregulated market. How to use non-direct policy tools to get these changes? Not going in and say: here you have 500 SEK to do this. But to use simple rules of getting mainly the prices right. Decentralised decisions can help to get all these small solutions into place. You do not have somebody saying "this is the right solution".

The chairman concluded that the market solutions should have a more prominent place in the strategic vision.

One participant suggested using the phrase agreed upon during workshop three: pricing of emissions. We are talking about a trial to use the asymmetry of information access which is different at the private level and the public level. Both of them should be used for different things. For that we need some specific instruments and institutions.

It was argued that taking the information gap away is one way of increasing the efficiency of the market.

It was pointed out that the key messages are coming through the way the problems are phrased, the words that are used.

The chairman concluded that there was a call for a general philosophy, making special emphasis on market dynamics and the way authorities come in. Something should also be done in making correct prices via different kind of mechanisms. Then we have the detailed specific issues. The group agreed that this is a feasible and desirable way of amending the text.

It was emphasised that it is important to make clear that getting the market to work for the environment has a long-term value. Some very specific suggestions should be made here. The regulatory measures are actually quite different. The instrument that crosses the bridge is emissions trading because it is a market instrument form of regulation.

The chairman concluded that the group had agreed that there will be an appendix explaining the controversy between fees, taxes and other approaches. The major innovation will be to have a more general philosophy first, focussing on market-based solutions and then put all submeasures into that framework. So it will be a reorganisation and a reprioritisation.

The hydrogen option

Next one participant brought up the hydrogen option. "How to present the image related to the growth of the share of hydrogen? I suppose that for the short term it could be presented as an option to improve or increase the security of energy system operation. Because with this idea we can store renewable energy in the form of gas. It could be used as a peak supply option because of some problems with load direction curves. For the short term, this idea could be presented most as a peak time related option, not as a base line, for energy systems. I think that it would be more arguments to increase investment interest to pay for the costs which are extremely high."

Creation of an energy service market

It was proposed to look for the creation of an energy service market, which will regulate some options related to energy supply technologies and energy efficiency technologies together. For this purpose the market needs an institution. It also needs some formal decisions, which will be transparent for private companies. For this reason we also have to have liberalised and competitive energy markets, but also competitive markets for appliances. All of them can and should be managed within the public level. A good institutional environment should be created for that. We need to create a specific market for energy services that will bring energy suppliers, suppliers of appliances, and financial institutions together and clarify which options are really the most competitive ones. "This proposal will require some specific regulation of the market. Deregulation need some frame, such as the stock exchange. You need to bring companies together, make decisions transparent, make it possible to compare offers from France, Greece, Poland etc. on one place. Because we have now globalisation and this should be really possible."

It was noted that this idea is similar to the Energy Efficiency Trust in the UK. The proposed energy market would not operate only at the national level but also at the EU and global level. Every company which is able to propose economically competitive solutions should be able to participate.

The energy service market would minimise transaction costs. As one participant put it: "Transaction costs are a short-term barrier for energy efficiency. For that reasons it would be really profitable to concentrate the energy trade on a kind of a market, a kind of a stock exchange."

The proposal would provide a way for demand-side options to compete with supply options. But there would also be competition between demand-side options and between supply-side options. As opposed today we have plenty of energy service companies and each of them are operating on its own. What is needed is a good framework to make transactions transparent and make companies compete to find the best solution.

The public sector has a fundamental role for achieving this. Because rules have to be established by public institutions and governments and the market has to be controlled. These requirements have to be established by public institutions.

The potential value of the idea was illustrated by an example from Poland. "We have many problems with thermo-modernisation. We know quite well that we have a huge potential to save energy in existing buildings. But because of high transaction costs and because of lack of standardisation etc. many projects are never undertaken. There is the same problem with Joint Implementation. The transaction costs for Joint Implementation, at least in Poland, are up to 30 per cent. It is unreasonable for business. Only if we can standardise baselines you can really accelerate decisions from the private side. Because then the risks for private companies could be under control."

The question was raised whether this is the only means to have transaction between companies. Is it also conceivable to have bilateral agreements between energy service companies and the client? It was concluded that it should be an open decision for the actors.

It was noted that public purchasing can be a tool to create a market so the demand for that kind of services increase. But without the proposed mechanisms the cost of investment for public buildings, for example for insulation material, will be much higher. Having a well-established market we can diminish marginal costs. By increasing competition we can support a process of growing. Even specific investments for public institutions, for hospitals, schools etc. could be much cheaper.

Conflicts between options

It was noted that some options conflict with each other at some point. For example, if public resources are mobilised to get biomass off the ground, it could cut off some of the options of some of the other desirable technologies. One example is that if you would put public money into supporting bioethanol or some other type of biofuel in the transport sector, then you might actually slow down the ability to bring in hydrogen fuel cells later. Because different kinds of fuels require different kinds of distribution systems and they will be competing with each other at some point.

This issue is related to the importance of setting criteria for policy-making. What is good for the short term and medium term may not be the optimal solution for the long term.

This aspect is also related to the issue of flexibility. It is wise not to invest too much on one option.

In the last part of this session sticker voting was carried out to set the priorities for short-term actions. The outcome of this exercise is presented below.

FOCUS ON THE LONG TERM	Number of votes
The EU should elaborate a vision about how the climate policy regime should develop for the long term to meet the ultimate objectives of the UNFCCC. Various stakeholder groups should be invited to participate in this process. It is desirable that this issue is addressed already during Sweden's Presidency in the first part of 2001.	*****

The EU should adopt the 80 per cent target as an indicative target for 2050. Those countries who are willing to agree upon this ambition level could work together on a voluntary basis. The "30 per cent club" and its role in promoting acid control measures is an interesting precedent here.	
The Working Party for Climate Change, that is the main forum for climate policy in the EU, should devote at least one (extra) meeting per year for addressing issues which go beyond the time horizon of the first commitment period of the Kyoto Protocol.	
It is desirable to strengthen the European Commission's capacity to deal with long term climate policy. For this purpose a cross-DG strategic unit for long-term climate policy should be set up by the European Commission.	****

EU ENLARGEMENT	Number of votes
<i>With respect to the EU's enlargement we propose that the EU creates mechanisms and a strong policy framework that make it easier for the candidate countries to leap-frog in developing its infrastructure, technology mix and consumer cultures. This could involve the creation of a financial mechanism that creates advantages for the long term without causing economic disadvantages for the short term and policies channeling the current dynamic transformation towards low-carbon pathways.</i>	
<i>Centres for Sustainable Energy Transitions (CSET) could be set up in all candidate countries in Central and Eastern Europe (and elsewhere in Europe) to (1) promote quick diffusion of good ideas; (2) initiate strategic dialogues with key stakeholders; (3) use internet for distance education and courses; (4) promote relevant research; and (5) generate new business opportunities.</i>	*****
EU enlargement will free up new land for biomass and add an immense potential for energy efficiency in Central and Eastern Europe – if acted upon in time.	*

SUPPLY SIDE OPTIONS	Number of votes
The EU should initiate a large-scale R&D programme for solar PV. Furthermore, mandatory requirement of installing PV in newly built houses and commercial buildings can be considered.	
The European Commission should promote the solar hydrogen option. Firstly, an information campaign should be launched. Secondly, a dialogue should be initiated with the oil and gas industry and with car manufacturers. Thirdly, the first preparatory steps towards a standardised European network for hydrogen distribution should be taken.	***
<i>Allow set-aside subsidies to continue for land used for energy crops.</i>	
Close guaranteed supply contracts between farmers and biomass-fuelled plants.	
Investigate possibilities for combination of land uses. This task will require action by DG Agriculture, research organisations and farmers organisations.	
Start experiments with biofuels (limited distribution e.g. gas stations	**

from one big oil company along major highways). This is an area where co-operation with the oil industry could be very fruitful.	
Subsidies or procurement programmes for the development of biofuel (or hydrogen) dedicated cars.	
Subsidy gas stations/oil companies to provide biofuel outlets.	*
Co-ordination is required between EU waste policy and EU biomass policy. This issue should be addressed by several DGs of the European Commission (DG Agriculture, DG Energy and Transport, DG Environment and others).	****

<i>DEMAND-SIDE OPTIONS</i>	<i>Number of votes</i>
An appropriate regulatory framework for the energy sector liberalisations counteracting the interest in just increasing energy sales. It is also important to establish the institutions in a liberalised energy market which will be responsible for energy efficiency.	**
Strict energy performance standards should be imposed for new buildings. European guidelines are needed here. DG Energy and Transport could have a crucial role to play in this respect.	**
Mandatory energy performance certificate for existing houses upon sale. This could be coupled with subsidies for retrofit and in a later stage (e.g. 2020) be replaced with minimum performance standards. To benefit from this opportunity, the EU should initiate co-operation with the construction industry and the real estates industry.	
Minimum efficiency standards for all appliances, updated every five years, in which the lowest efficiency classes are eliminated, combined with good labelling for all energy energy-using equipment. EU Member States could establish voluntary agreements with manufactures to make this happen.	
The EU should take appropriate action to benefit from the immense window of opportunity for efficiency improvements in Central and Eastern Europe in the short term.	
Provide tax incentives for public transport users, car poolers (e.g. through tax rules for lease/company cars) and bike riders. These options can be explored by EU Member States, employers (together with their associations) and municipalities.	
Create institutional possibility for energy services trade on specific stock exchange for: <ul style="list-style-type: none"> - Concentration of demand and supply for that services on one platform and than standardization of products and transparency of trade, - Better security and efficacy of the energy services contracts, - Easy access to information related to energy services for every potential actor. As an effect it should lead to eligible: <ol style="list-style-type: none"> 1. Increase of scale of energy services related activities, 2. Decrease of the transaction costs for DSM, 3. Increased competition in/between DSM and SSM options. 	*
With respect to <i>industrial transformation</i> : the European Commission could create a new institutional body to deal with the product chain in a more integrated way.	*

OTHER POLICIES AND MEASURES	Number of votes
The EU should introduce a <i>carbon dioxide tax</i> . The sinking electricity costs in some countries in Europe is a <i>window of opportunity</i> to do this. Immediate action is required to benefit from this window of opportunity.	***
The EU should develop strategies to <i>avoid the creation of stranded assets</i> in the future and to <i>deal with the losers of the transformation</i> .	
A <i>European task force</i> should be set up to elaborate new and effective strategies aimed at involving the general public in the fight against climate change. This is an issue we hope Sweden will address during its EU Presidency in the first part of 2001.	***
<p>The EU research agenda have emerged from the COOL Europe process:</p> <ul style="list-style-type: none"> • The feasibility of a far-reaching decentralisation of the energy system in Europe should be investigated thoroughly. • The opportunities and constraints for renewable energy sources and energy efficiency in the liberalised energy markets in Europe need to be studied more. • Research is needed about the decision-making criteria that should guide the transition towards a low-carbon energy system in Europe. • The EU should devote a higher percentage of its GDP for R&D to come in line with the current level in Japan and the USA. 	*

To conclude, the highest priority was attached to the following actions and options:

- The EU should elaborate a vision about how the climate policy regime should develop for the long term to meet the ultimate objectives of the UNFCCC.
- Centres for Sustainable Energy Transitions (CSET) could be set up in all candidate countries in Central and Eastern Europe (and elsewhere in Europe).
- Co-ordination between EU waste policy and EU biomass policy.
- It is desirable to strengthen the European Commission's capacity to deal with long term climate policy. For this purpose a cross-DG strategic unit for long-term climate policy should be set up by the European Commission.
- A *European task force* should be set up to elaborate new and effective strategies aimed at involving the general public in the fight against climate change.
- The EU should introduce a *carbon dioxide tax*. The sinking electricity costs in some countries in Europe is a *window of opportunity* to do this.
- The European Commission should promote the solar hydrogen option.

3.1.3 Building commitment for the strategic vision

Magnus Andersson informed the group that a list of possible target groups for the strategic vision has been prepared. After the final version of this document has been prepared there will be an interactive phase with communication with key stakeholder groups and within our own policy communities. All persons in the group are invited to take some degree of personal responsibility for this process. Some of the priority target groups could be the Working Party on Climate Change of the European Union, European Parliament, various DGs of the European Commission, European Investment Bank, Central European University in Budapest and various institutions in Poland.

One participant pointed out that there is a danger in this process that we invent something which suits just about all audiences but does not suit any of them at all. Moreover, 20 pages could be too long if we try to engage senior people. But if we want to address technical people it is probably too little. The message can be exactly the same. It is just how we write which is different.

The group agreed that the messages should be slightly different for different audiences. For example, the kinds of messages we are trying to get to policy-makers should be different than the messages that will be sent to consumer groups. The messages can be boiled down to the simplest level. One participant argued that it is important to work with children and teenagers. It could be useful to interest media to look for the reaction from policy-makers.

For the document to be of practical use for NGOs the thing to emphasise is that the long-term perspective has brought some short-term policy implications.

The chairman said that the outcome of this project is not only the document itself but also the experience accumulated in the group of individuals. It is not very common to get a group of people with busy jobs staying on to a series of workshops of this kind. At this final workshop there are now more people than in previous workshops. It means that the process has been attractive. Perhaps we can build upon this experience in getting the document out to other audiences. It is not only a matter for the project team to work with the dissemination of the results. It all depends on the commitment and interest in the group contributing to the future life of the strategic vision. The chairman then closed the energy sector group proceedings.

3.2 Transport

3.2.1 Actors and actions: government and transport sector

In the afternoon session of the transport group the section in the strategic vision document concerning “Actors and actions” was elaborated.

First ideas were collected:

Actors and actions: government and transport sector

- both should be working together more
- start doing something and what should we stop doing
- integration of modalities

Government (=European Commission?)

- responsible for infrastructure
- focus on services and dematerialization *
- need for transparent policies
- integration of external costs ****
- create opportunities for experiments *

Transport sector

- large customers and transport companies should work together
- get customers to set standards
- industry needs an international framework
- How to balance short term and long term actions: what priorities?***

With regard to one of the actions mentioned under “Government”, it was noted that integration of external costs is rather a precondition. We should show what options exist to integrate external costs and under which circumstances they can work: describe what we mean, propose a stepwise approach, formulate framework conditions, and let it be accompanied by other measures. Infrastructure R&D and experiments are needed as well! It explains why there are so many measures in the path analysis table. Measures furthermore should be connected to timing. In 15 years, prices can be gradually increased three times.

To elaborate government and (private) sector actions in more detail, the group was split into two subgroups. One subgroup elaborated possible actions by authorities and the other subgroup elaborated actions by the (private) sector. After one hour the groups presented their results:

3.2.2 Sub group government

The most important question regarding policy action is: What are the most effective actions by which policy level in what time frame?

The group agreed that policy should be aimed at the effects (doesn't matter what modality) but didn't evaluate effects of the measures discussed.

Suggestions included:

- ecotax
- roadpricing/kilometer tax
- CO₂ ceiling/ tradable permit/ ecopoints CO₂ permits: pilots!
- CO₂ budget → not only transport → trading system (no need for standards and ecotax)
- Transportation audit: what will the building of a new part of the city mean for transport needs?
- recognisable rewards for implementing environmental friendly things → setting criteria for what is sustainable transport
- how to address the transport sector?
- measuring/monitoring system, make reduction visible
- transition management (stakeholders, sustainable transport) intermodal travel/transport
- infrastructure for bicycles.
- economic instruments → influencing behaviour/fiscal incentives
- enhance regulatory measures, enhance infrastructure
- joint action between government and business “voluntary agreement”

The suggestions can be grouped in the following way:

Economic instruments

- taxing and exemptions
- road pricing/kilometer tax
- tradable CO₂ rights

Regulatory

- enhance efficiency, local community should have travel plan
- accountability/measurement
- CO₂ budget
- Transportation and its investments
- CAFE-regulations
- technology forcing measures

Technological

- fast intermodal public transport

Strategic

- transition management
- addressing markets on appropriate scale
- policy stakeholder approaches
- spatial planning and infrastructure
- public transport should unite: mobility providers. Link up with transport and car companies
- Increase public understanding of the problem, more windows to work on this issue (NGOs: higher credibility, support financial NGOs)
- gradual/phased introduction of measures
- collaboration between cities to increase the market for new solutions

3.2.3 Subgroup (Private) sector actions

Preliminary remarks:

- Since transport is a derived demand, we must also address the customers of (sectors who use) transport

- Energy is too cheap currently to move in the direction of climate neutral transport

Suggested actions:

- include transport in environmental reporting, ISO 14001 and EMAS
- promote environmental aspects of transport as a marketing tool (way of product differentiation)
- try to achieve voluntary agreements within the (sub)sector
- press suppliers to deliver latest technology and perform R&D into the direction of climate neutral transport
- more research on: aviation emissions, alternative fuels
- use market instruments (trading, charges)
- develop infrastructure for new modes of transport/technologies
- railways: 1) operational measures to improve efficiency; 2) use other fuels: in some countries railways use 85-100% green electricity – this could be a model for other countries as well, or use PV systems on roofs of trains, DK puts wind energy besides railways and experiments exist with PV solar panel on acoustic shields; 3) improved technology in the rolling stock – trains with fuel cells are currently under research; 4) use of information systems and Europeanisation of environmental management systems; 5) campaigning in the modal shift.
- long term targets/standards
- open the debate within the sector on the internalisation of external costs
- conduct experiments
- intermodality: invest in new services + multi-modal companies. Compete with car/product
- develop infrastructure for new technologies + new forms of organisation (PPP)?
- include transport early in the emission trading systems
- implement an EU kilometer tax for heavy duty vehicles
- start dialogue within the sector to break the walls between modalities

Clustering of these actions led to the following results:

Own responsibility of the sector

- include transport in environmental reporting, ISO 14001 and EMAS
- include transport early in the emission trading systems
- try to achieve voluntary agreements within (sub)sector
- long term targets/standards
- operational measures to improve efficiency

Improved co-operation between transport and customers

- promote environmental aspects of transport as a marketing tool (way of product differentiation)
- use of information systems and Europeanisation of environmental management systems;
- press suppliers to deliver latest technology and perform R&D into direction of climate neutral transport

Marketing

- use market instruments (trading, charges)
- promote environmental aspects of transport as a marketing tool (way of product differentiation)
- use of information systems and Europeanisation of environmental management systems;

Increase efforts in R&D, testing and application of alternative fuels and development of necessary infrastructure

- more research on: aviation emissions, alternative fuels
- develop infrastructure for new modes of transport/technologies
- operational measures to improve efficiency use other fuels:
- long-term targets/standards
- press suppliers to deliver latest technology and perform R&D into direction of climate neutral transport
- improved technology in the rolling stock
- conduct experiments
- develop infrastructure for new technologies + new forms of organisation

Government actions: prices and trading, taxes, infrastructure and long term standards.

- Implement an EU kilometer tax for heavy duty vehicles
- use market instruments (trading, charges)
- Open the debate within the sector on the internalisation of external costs
- Long term targets/standards

Improve intermodality and integration

- Start dialogue within the sector to break the walls between modalities
- intermodality: invest in new services + multi-modal companies

3.2.4 Discussions on the presentation of the document

The last part of the meeting was devoted to the presentation and the outreach of the document. How could the document be relevant for the outside world?

The following was suggested:

With regard to the content in general

- It should be credible
- It should show commitment and create general commitment
- It should present the problems: who suffers if we don't start action now?
- It should present the benefits: if we do start what will be the benefits?
- It should be targeted not only to transport but also customers of transport
- It should concentrate on creating incentives
- It should emphasise multiple policy objectives
- It should demonstrate economic benefits

With regard to it's basic messages

It should make clear that:

- Structural change is needed and that this takes time to implement. Currently policy is no success because of lack of long term thinking.
- Policy should help customers how to set demands.
- Benefits of measurements should be shown to consumers. There should be attractive options for users
- Information to actors should be improved
- Research and pilot projects should be intensified
- Dialogue between different modes of transport should be strengthened
- Public and private partnership should be developed
- Coherent win-win situations should be identified. When there are things to lose, there are also incentives

With regard to presentation of the document

- It should be presented in the European parliament
- There should be attached an executive summary of 2 pages
- The design of the cover should already deliver the message.
- It should appeal to industries: Should have EU-Logo or so
- On cover it should be clear that this is the product of different groups (companies, NGOs, government representatives) from different areas and from 14 different countries.

Upon closing the session, one of the participants illustrated the importance of having a positive and pro-active attitude in order to inspire and work from a vision:

