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Science and Technology Options Assessment

S T O A

The Future of European long-distance transport

Synthesis Report
Interview meetings on long distance transport and global warming

(IP/A/STOA/FWC/2005-28/SC21/27/37)

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Executive Summary

The participants in the three interview meetings are generally very concerned about global warming and oil dependency. The majority of the participants from all three countries also find economic growth and mobility very important, but when forced to choose their priority is on limiting global warming and protecting nature resources. Many participants, in particular the Danish, express a feeling of big personal responsibility for growth in transport and the CO2 emissions from this. They point to their overspending of transport and goods and their welfare based on heavy energy consumption. A smaller part of the participants tend to be more worried about a decline in standards of living – especially Hungarians and also some of the Greeks – than about limiting global warming.

The majority of the participants from all three countries are not used to consider the transport history of the goods they buy. The price of the goods and the quality means more for them, and they don't think about whether the products are manufactured or transported in an environmentally friendly way. However, in the group debates they added that information could change their attitude.

There is a strong confidence in technological development among the participants, and they believe that the problems of CO2 emissions from long distance transport should primarily be handled with technological solutions. In the group debates many suggested to make existing clean transport solutions available as soon as possible, so that citizens can choose these technologies if they wish to reduce their CO2 emissions. Some – especially the Danes – also want to motivate citizens to change their behavior in a more sustainable direction, while the Greek and Hungarian participants did not believe in changing life style. All participants however seem to agree, that the technological options needs a push to be developed and implemented.

In line with this, the Danes may be more receptive to pricing as a way to force people to change behavior. All participants are against general increases in transport price, but many can accept higher prices in relation to the size of a goods' carbon footprint. Polluter pays principle is supported by the majority as a fair principle, though some fear that it wont have much impact on CO2 emissions. The stick-and-carrot balance was widely discussed in the interview meetings. The Hungarians argued that they would rather reward the environmentally friendly behaviour than use duties and penalties to punish polluters.

The participants generally consider modal shift from car or airplane to train to be a good idea, but there is a major challenge in the lack of quality offered by the national rail systems. Trains have to be able to compete on price, comfort and punctuality to become more attractive. To move freight transport from trucks to rail got a major support from the participants.

Even though the participants don't want a general reduction in passenger transport nor transport of goods, many of them are willing to take personal responsibility by reducing their travel and goods consumption in relation to CO2 emission.

There are many means of reducing CO2 emission from transport. Reduced speed for airplanes and cars is widely accepted in all three countries. Reliability and punctuality (arrives on time) and traffic safety will support the acceptance. Reduce traveling by introducing virtual meetings is an option but seems a bit too futuristic to be really taken on board by the participants.

One of the most popular means is information. More information to the Citizens of the consequences of transport for CO2 emissions, specifically a carbon footprint label and a bio fuel label, and more research and development in CO2 lean transportation are the most popular policy measures among the participants in the interview meetings in Greece, Hungary and Denmark.

Another policy measure is road pricing which is accepted by a little less than half of all the participants. Road pricing is most popular among the Danish participants where two out of three find it to be a good policy measure. Some find the measure to be most relevant in urban and congested areas.

Individual carbon allowances and carbon tax is seen as a good measure by almost half of the participants, with the Greek and Danish participants to be far the most positive to this, with the argument that it is more equal and highlight the responsibility when given to the individual. But more than half of the participants in the three interview meetings are not in favor of using carbon taxation in order to reduce CO2 emissions. They find the tax burden to be high already, and some doubt that it will have the desired impact. It is remarkable that both the Greek participants and the Hungarian participants distrust their political leaders and the public authorities. Often they give this as a reason for not wanting to pay more taxes. The Danish participants seem to trust the authorities and political leaders more in this field.

The participants in general see a need for joint efforts in EU - and globally - in fighting global warming, and thus see EU as the most important actor for governing the transport sector towards reduced CO2 emissions. They were even prepared to move more power to the EU to enable standardization and regulation that will make the transport system CO2 lean European wide.

The group discussions reveal that many participants don't trust industry to take responsibility on reducing CO2 emission.

Even though many of the participants, in particular the Danish, feel a big personal responsibility for reducing CO2 emissions, they stress that leaving the initiative to the individual will include the risk of chaotic response to global warming. Citizens need support from politicians - role models and guidelines are asked for.

Investing in research and development of CO2 lean transport technologies is given highest priority from a very large proportion of the participants in all three countries (more than 80 percent). Second comes investments in ITS, and rail investments are third. It is remarkable that no participants - zero respondents - support investing in more airports in Europe. The support for investments in new roads is rather low as well, with the Hungarians and Greeks being a little more in favour of this than the Danes.

Document purpose and destination

This document is Deliverable 6 of the Project on “The Future of European Long-Distance Transport”. It provides the synthesis report on the interview meetings carried out in Phase III of the project. The interview meetings are based on a scenario study in phase I and II (Deliverable 5). The objective of the project is to contribute to policy clarification by providing scenarios for the year 2047 that will meet targets for reducing oil dependency by 80 percent and CO2 emission by 60 percent in European long distance transport, both passenger and freight, without reducing accessibility. The project will be completed in October 2008.

The scenario study was worked out together with a group of experts established for this project. The methodology used is the back casting approach. The scenario study aims at giving an idea of the magnitude of change that is needed if certain targets should be fulfilled and it aims at assessing and illustrating potential options for policy measures and technologies in the light of different situation.

For further information about the project and the STOA panel and the project, please visit the project's homepage at:

http://www.tekno.dk/subpage.php3?article=1386&toppic=kategori11&language=uk&category=11

Preface

Between the 17th of June and the 1st of July 2008 three so-called 'interview meetings' were carried out in Hungary, Greece and Denmark. The interview meeting is a method that combines debate, completion of a questionnaire and group discussions. An interview meeting takes three hours and is normally held as an after work event involving 25-35 participants. The three interview meetings of the STOA long distance transport project resulted in three national reports. These national reports are the basis for this synthesis report. The synthesis report combines the results of the national reports and gives an overview of the participants' attitudes towards long distance transport and global warming and points out the national differences.

Occasionally, the report will use the terms Greeks, Hungarians and Danes when naming the participant groups from the respective countries, but these only represent the attitudes of the group, not the population.

Methodology

The organisers in the three countries carried out the national interview meetings on the basis of a predefined manual that describes the method and gives thorough instruction in how to carry out interview meetings in the context of the STOA long distance transport project – the manual can be found in Annex 1. This part of the preface will briefly address the relevant methodological issues and the value of the collected statistical results.

The interview meeting

The interview meeting is a method to gain knowledge of what a group of people think of and how they feel about complex technologies. It is not a method that claims to represent the whole population; rather it seeks to include a diverse selection of citizens selected on the basis of demographic criteria such as age, gender, education and occupation.

Using group interviews and a questionnaire, a group of 25-35 people are asked at the interview meeting about their perceptions and preferences in relation to a technology, or a technological development, challenge or problem. As a rule, interviewees do not possess any expert or professional knowledge of the technology in question. However, prior to and during the meeting, the participants are informed of the advantages and disadvantages of the technology in order to give them a balanced and factual common starting point. In the STOA long distance transport project, this information was based on the results of the scenario study in the previous phase of the project. The information material can be found in Annex 2.

The methods of questionnaire and group interview complement each other well; the questionnaire ensures that all the participants are heard and that there is comparable data relating to the most important areas. The group interview, on the other hand, creates a lively debate and ensures that the participants can include aspects that are not addressed by the questionnaire and that different arguments are voiced.

National recruitment and group composition

Due to national differences, the participants for the three interview meetings were recruited in different ways.

The participants in the Danish interview meeting were recruited for the purpose of creating a differentiated group. The purpose is not to have a representative cross section of the Danish population, since this would require a far larger selection of participants. The participants were selected on the background of gender, age and educational level. 2000 invitations were sent out to randomly selected people aged 18-75 in the greater Copenhagen area. A group of 40 people were selected from among the positive responses. Not everybody showed up at the meeting, so even though the final group had the expected composition of age and gender, there was a lack of people with shorter educational backgrounds, which resulted in an overrepresentation of medium and long educational backgrounds – for more details on the selection process, please refer to Annex 1.

The Greek participants were recruited by using a 'Consumers' Data Base' as statistical frame. Initially, 200 members fulfilling the criteria (both genders, aged 18-65, living in Athens) were selected from the database since, in our experience, the final participation rate is estimated to be about 30 percent. Having contacted the selected sub sample of the Consumers' Data Base by phone, 55 were found available and willing to participate in the interview meeting. 35 out of these 55 were selected for the purpose of fulfilling the gender, age and education quota and to have four times each specific profile (gender, age, education, working status), in order to be able to form four compatible groups for the group discussions after the first phase of the interview meeting. Two weeks prior to the meeting, these 35 people received a letter of confirmation and various interview materials by mail. In addition, they were contacted by phone at least twice prior to the meeting in order to remind them of the meeting, to help them understand the material sent and to confirm the final participation. Not everybody showed up at the meeting, but the final group had the expected composition of age, gender and educational level – for further details on the description of the participants' backgrounds in relation to the selected matrix, please refer to Annex 1.

The Hungarian organiser used telephone recruitment instead of letters. The methodology of the random selection of participants and telephone recruitment might prove to have a higher degree of randomness, as the human contact makes it possible to encourage people to participate in the meeting – people who would have been unlikely to reply to a written invitation in any country.

Statistical approach

This report will feature several statistics based on the collected data from the meetings. The three meetings gathered a total of 84 participants, 44 or 52.4 percent of the participants were female, 47.6 percent had children, and 16.6 percent had tertiary education.

The participants were distributed as intended between the three age groups and the two genders. However, the subset consisting of people with long education was bigger than originally intended. The figures on the composition of participants are listed in Annex 2.

The composition does not seem to influence the qualitative results significantly, as we find no indications that certain arguments were repressed in the debates. We find the same arguments presented in all three countries, which validates the findings. However, the quantitative results could be slightly biased towards a more critical view of the climate change impact of long distance transport, as this is the general tendency in the available data for people with higher levels of education.

Since the report is not based on a random selection of citizens from the participant countries, it will only rarely feature specific numbers and percentages, but rather speak of tendencies. In general, the focus is on the results and arguments that are shared by the participants from all three countries. Significant national differences, however, will be highlighted.

For the actual statistics, please refer to Annex 5.

Purpose of the report

Interview meetings are one of the crucial elements in the STOA project: *The future of European long distance transport.*

The Danish Board of Technology (along with ITAS) is conducting the project on behalf of the European Parliament's Panel for Science and Technology Options Assessment (STOA), which funds the project. The objective is to contribute to policy clarification by providing scenarios for the year 2047 that will meet targets for reducing oil dependency by 80 percent and CO2 emission by 60 percent in European long distance transport, both passenger and freight, without reducing accessibility. Citizen consultations in the form of interview meetings are part of the project. The project will result in recommendations of policy options for the future development of long distance transportation in the European Union. The views presented at the meetings are an important element in the project.

This synthesis report sums up the attitudes and arguments presented at the interview meetings in the three countries Greece, Hungary and Denmark.

1 General attitude

1.1 Differences in general attitude to transport and global warming

Before going into details on the results of the three interview meetings, it is interesting to look at the differences in general attitude in the three countries.

In Hungary, the issues of long distance transport and its impact on global warming is not high on the public agenda. Issues such as the relationship between CO2 emission from transport and global warming, new technologies and better conditions of travelling are rarely discussed in public in Hungary. People have experiences with traffic jams and congestion from their everyday commuting to work in the city, but the public awareness of the environment and the consequences of consumerism is rather low. However, a positive tendency can be seen in this field as the Hungarian media have dealt with environmental issues more often within the last couple of years. Though Hungarians are concerned about nature, environment and quality of life, what they fear most is a decline in their standards of living. In general, the Hungarian participants had not reflected on the connection between transport and global warming before, and at the meeting they expressed that they had learned a lot about the topic by being part of the interview meeting.

> *"One thing is for sure, that we are not that informed in Hungary that we could take into consideration these many opportunities" (Hungary)*

The Greek participants expressed that modern lifestyle including high mobility, economic growth and access to goods from all over the world is very important to Greek people. They see this as part of their right to freedom, and they believe that Greeks in general are rather less sensitised to environmental issues compared to other Europeans and almost totally unaware of the impact on the environment of long distance transport. They mainly blame industries for CO2 emissions and global warming, and also they find transport to be of less importance than other sources of pollution, for example from industry.

> *"I am aware of global warming but I could not imagine how the transport sector contributes to it." (Greece)*

> *"I still cannot think that individuals have the main responsibility for environmental pollution, as industry and corporations don't respect the environment." (Greece)*

Meanwhile, it is difficult for them to connect the transport sector with environmental pollution. They believe that long distance issues do not concern them, since Greeks rarely travel more than 150 km; so it is not a part of their everyday life. They point out that the material they read for the interview meeting had surprised them.

The Danish participants are generally well aware of environmental problems. They are also increasingly aware that transport contributes significantly to global warming, and congestion in urban areas is often discussed in public a along with infrastructure and energy efficiency issues. The Danish participants stressed globalization as an important driver for transport growth and that skipping global trade could harm less developed countries. They described the welfare of Western countries as strongly related to oil consumption. Still they were rather surprised by the close connection between consumption, transport and global warming. They expressed the view that consumption in the Western countries today is characterized by overspending and the hope that recently developed countries will not make the same mistakes regarding overspending of energy due to travel and consumption of goods.

"We have used a lot of energy and fossil fuel to reach the level of welfare we have here in the West. I guess there is also a responsibility towards the developing countries. You cannot say that they should not pollute. Well, you can say it, but then you have to give them some means, technologies, to develop to other conditions" (Denmark).

There is a general concern among the citizens about global warming and the dependency on oil, and the participants do not question that global warming must be taken seriously.

1.2 Participants travel long distance

The participants generally travel long distance quite often. One third of the participants travel long distance at least once a month and 4 out of 5 at least once every six months. The most used means of transport is car followed by aeroplane and train, and most traveling is related to vacation and visiting friends and family, not work related. Danes travel much more LDT by aeroplane than Hungarians and Greeks, who rarely travel by air. 3 out of 4 of the Danish participants travel at least once a year compared to less than a third of the Greek participants and 1 out of 10 Hungarian participants. The habits of long distance transport by car and train are more similar in the three countries.

1.3 Economic growth or limiting global warming

The vast majority of the participants (all but two) in all three countries find mobility and economic growth to be highly important and interdependent. But they are more split when it comes to how important they find it to be easily transported across Europe and they are much more reluctant about the importance of being able to buy goods from all over Europe and from all over the world.

When comparing the answers from each of the three countries, one will see some differences between the three countries. The Greeks find it more important than the Hungarians and Danes to be able to buy goods from all over the EU and the whole world, and as an argument they point to their own dependency on export of Greek products.

"It is not only the grapes in winter, it is also the olive oil, our traditional product that has to be exported to boost our economy" (Greece)

Protecting nature resorts and fighting global warming is also very important to the participants in the three countries as almost all participants find it highly important. Furthermore, they are worried about both CO2 emission from transport and the oil dependency in the transport sector.

When they are forced to choose what is most important, there is a clear tendency to prioritize the fight against global warming and the protection of nature resorts over economic growth and mobility. About half of the participants prioritize nature protection and limiting global warming while the other half find it to be just as important as economic growth and only 2 out 84 participants stress economic growth as more important.

The general results cover some national differences. A vast majority of the Hungarian participants consider the importance of mobility to be equal to the importance of limiting global warming, while most of the Greek and Danish participants find it most important to take action on climate change. When comparing importance of economic growth and mobility with protection of nature resorts, we find the same trend.

1.4 Overspending of goods and travel

Some participants express that they find today's consumption to be characterized by overspending. Both as far as travelling and as far as consumption of goods is concerned. We have developed habits that are not good for the environment and we must change these habits:

> *"It has become quite cheap e.g. to fly and we have gotten into some habits both personally and work related, and I think that we should think about how we can change our habits and only use it (aeroplane) when necessary." (Denmark)*

The inhabitants of Denmark and other Western European countries are spoiled, some Danes argued:

> *"We have much more expensive habits compared to e.g. the Eastern European countries, they don't have the same economical means as we, so talking about who is travelling and flying most, it will be people from the old Western European countries." (Denmark)*

The Danish participants emphasize that demands are created by the availability of new technologies, in particular relatively cheap electronic devices such as the mobile phone, which we tend to replace every time a new model enters the market. Among the Greek participants, it is argued that aeroplanes and cars are convenient and comfortable means of transport that we have become used to and will find it hard to skip again. Some argue that we are governed by the technological development and not the other way around.

> *"I believe that technology has played a rather negative role in environmental behaviour" (Greece)*

> *"Use of cars is part of Greek culture and we cannot understand how devastating this is to the environment, as great CO2 emissions are caused by cars" (Greece).*

From Hungarian participants the arguments are more focused on the economical limits of the consumers.

> *"People ... cannot afford, although they know that more money should be spent on the things which are closer and make less pollution" (Hungary)*

For all participants, it seems difficult to act in opposition to existing consumption patterns.

1.5 Limited awareness of the transport history of goods' transport history

When buying goods, regardless of whether it is food or non-food, the choice of the participants in the three countries are very much influenced by the quality of a product, a little more than by the price. However, the price also influences their choice quite a lot. To a lesser degree, they are influenced by whether the product (food and non-food) is produced under environmentally safe conditions, and they are only to some degree influenced by the country of origin when choosing their goods.

When it comes to the travel distance of food and non-food goods, only a minority of the participants state in the questionnaire that they are aware of how far the goods have travelled and that it affects their choice of goods. The majority of the participants are either unaware or aware but not influenced by the travel distance of the goods they consume. The same goes for the country of origin.

“When shopping, I have never been thinking: I wonder how far this sweater has been transported? No, I have been thinking: This looks good on me, I'll buy it.” (Denmark)

"If I see something that costs 117 forints and the other product costs 280 forints, I don't look to see where it has been transported from, I buy the cheaper one" (Hungary)

Regarding how the products have been transported, the majority of the participants in the three countries do not think about it at all. Also the CO2 emission during the manufacturing of commodities is something that only a minority is aware of, and even less is influenced by it when consuming.

Some participants express that they find it silly to buy food that have been transported very far. For others, it is a simple question of price.

“There is no reason to buy garlic from China for example” (Greece)

"One litre of milk coming from Poland costs 160 forints, the Hungarian milk costs 220 forints. It is a significant difference. It is 25-30 percent of the price that stays in my wallet" (Hungary)

When analyzing the countries separately, we find some differences between participants from the three countries. In Denmark, a third of the participants answered that 'country of origin' had a high/very high influence when choosing their goods. This share is significantly lower than in Greece and Hungary where approx. half of the participants gave positive answers in the same category.

1.6 Conclusions

- The participants from Greece, Denmark and Hungary travel long-distance frequently – the majority at least once every six months. While the Hungarians and Greeks rather rarely travel by aeroplane and most often use car or train, it is more common for Danes to travel long distance by air.
- The majority of the participants from all three countries find economic growth and mobility very important. When forced to choose between this and limiting global warming, they tend to prioritize the latter. However, as stressed by the Danes, there is a need for solutions that will not be damaging for developing countries with weak economies and for the new member states in EU.
- The majority of the participants from all three countries are not used to consider the transport history of the goods they buy. The price of the goods and the quality means more to them, and they do not think about whether the products are manufactured or transported in an environmentally sound way. However, in the group debates they added that information could change their attitude.
- The participants are generally concerned about environmental issues, but the Hungarians and also some of the Greeks tend to be more worried about a decline in living standards.

- Many participants, in particular the Danish, express a feeling of great personal responsibility for the growth in transport and the ensuing CO2 emissions. They point to their overspending of transport and goods and their welfare based on heavy energy consumption. Participants from Greece said that industry also has a great responsibility, and that pollution from this sector may be worse than from transport.
- Global warming and oil dependency is a major concern for the participants from all three countries.

2 Solutions to the problem of reducing CO2 emissions from long distance transport

2.1 Change of behaviour or technological development

Overall, the participants in the three countries believe that the problems of CO2 emission from long distance travel should be primarily handled by technological development. Change of behaviour was also mentioned and especially the Danish participants pointed to the need for a change of behaviour, stressing that it should go hand in hand with technological development.

> *"I think it has to be a combination because we are so far behind in developing the technology. So we have to concentrate on both, that's what I believe. Also because I think there is connection between our behaviour and the technological development. What can you do? Where does science-funding go? And how much are things set going? That also has something to do with whether we are willing to change our behaviour because then we will push for it to happen." (Denmark)*

Many of the participants find that our behaviour today is based on a culture where we have to move fast and be efficient. And our consumption is based on force of habit; we have become used to consume what we like without the limits of seasons and geography.

> *"We want strawberries in January, we want bananas from Chile… Everything has to run so fast, we don't want to wait. If a travel time of six hours can be done in eight we take the six because we have to get there. It all has to be fast and efficient." (Denmark)*

Greek and Hungarian participants point more to technological solutions, because they do not believe in changes of behaviour.

> *"I strongly believe that solutions will come from technology because we aren't willing to limit our living standards." (Greece)*

> *"I'm sceptical about it. It doesn't matter what is written on the box or on the label of the product. You can write a text about protecting the environment, if the other product is cheaper by 2 forints, then people will buy that one. … In most cases, comfort and routine plays so important a role, besides price, that it also strangles many good initiatives." (Hungary)*

Participants also express that they are not willing to give up comfortable living for reducing CO2 emission:

> *"I don't believe that if I limit my choices I will help decisively to less CO2 emissions." (Greece)*

However, during the group discussions some participants from Greece admitted that changes of behaviour could be an option:

> *"I would live without grapes in the winter, and I could avoid buying expensive imported products with large CO2 footprints" (Greece)*

2.2 Confidence in the technological development

In general, there is a strong confidence among the participants in technological development. When asked about which three means should be emphasized if the aim is to limit CO2 emission from long distance transport, most of the participants point to further development of CO2 lean fuel and propulsion technologies, the use of less CO2 emitting transport modes and increased use of ITS (Intelligent Traffic Systems).

Some participants go so far as to say that technology is the only feasible way of limiting global warming:

> *"When it comes to the point, I don't believe that any of us really will accept that we have to have lower living standards than today. This means, to the best of my belief, that we have to solve the problem technologically, so that we don't have to do that much to solve the environmental problems." (Denmark)*

> "*When we talk about solutions, we shouldn't talk about restrictions. Greeks have difficulties conforming to measures. It will be more effective if technology come to give them choices". (Greece)*

> *"I strongly believe that solutions will come from technology because we aren't willing to limit our living standards." (Greece)*

Others were sceptical about the future of technological development and innovation as economic interests are also present in this field. Corruption was also mentioned as it hinders technological change and efficiency.

> *"The lobby pays a horrible amount of money to keep this technology. … Consumption is the aim. They won't allow you to use solar energy or that your car goes by hydrogen made from water. … Ordinary people cannot do anything. Producers will force oil and the products made from it and cars will go always with these stuffs. We need to reach the point where cars and vehicles are produced in series that use these new people-friendly and environmental-friendly products, solar energy and wind energy." (Hungary)*

Some argue that technology must be prior to change of behaviour, which they see as a potential threat to the economics of the society.

> "*If we could make transport environmentally friendly, energy efficient and cheap, there would be no problem in driving goods around over long distances" (Denmark)*

Many participants point to efficiency in transport management and use of capacity. They see the use of ITS – intelligent traffic systems – as an important means to make better use of capacity and avoid congestion, both for freight and passenger transport on road and rail.

> *"Intelligent traffic management is worth gold for anyone driving, even if you are on your way to work or you are transporting goods to some place. To sit in your car on the highway and being informed by the signs that now you should take this or that route…suddenly traffic becomes more smooth" (Denmark)*

> *"In relation to the Intelligent Transport System, I could imagine that all transporters would get the information about transporting opportunities from a central database. And they would always go by loaded trucks on the roads, and the unloaded ones would not have emission. I think it would be a huge step. I don't know the proportion of unloaded trucks going on the roads, but there may be quite a lot." (Hungary)*

In spite of many examples of CO2 lean fuel and propulsion technologies and other technological solutions, several of the participants realise that implementing these solutions will not take place without a strong push for it.

> *"I don't think that anything will come by itself. I think one should put pressure on developing and implementing technologies." (Denmark)*

Hungarian participants believe that those who use CO2-lean technologies should be rewarded to encourage change of habits because of environmental awareness:

> *"It would be good if we incorporate penalties, sanctions into production. Or allowances. Because it sounds better that I disburden those who switch to environmentally friendly technologies." (Hungary)*

The costs of all these technological choices should be taken into consideration, since they serve as motives to consumers.

> *"I don't want to pay a fortune to buy a hybrid car" (Greece)*

2.3 Increased prices on transport

The price of transport is a sensitive issue for almost all participants. When asked which consequences they are willing to accept in order to limit the CO2 emission from long distance transport, 4 out of 5 are against an increase in taxes and duties. They find it much easier to accept a smaller variety of goods from abroad (3 out of 4), and a third of the participants can accept fewer business as well as holiday trips.

There are a number of striking differences between the countries. In Denmark almost half of the participants are willing to accept increased prices on clothes compared to almost none in Greece and Hungary. The same tendency, although not as strong, seems to apply for increased prices on daily necessities with a large CO2 footprint. The Danes seem to be more prepared to accept increased prices, or to be in a better economical position to do so.

In the group debates, the participants from Greece seemed to be rather negative towards increased prices for passenger and freight transport. The Hungarian participants also mentioned that if any price increase was introduced, it would fall back on the consumers, but it could be acceptable if they saw the result in reality.

> *"If the product is transported by trucks, then they should pay, because they don't transport by train. … The result is that the consumer has to pay, because the extra cost is incorporated into the product's price. … But if they say that they incorporate it and we will be there in a couple of years that this and that will end, then I say it's good. Because I see it, I experience it, and not only after 50 years." (Hungary)*

2.4 Change the mode of transportation

In the questionnaire, participants were asked to indicate how much more expensive travelling by plane or car it should be if it were to make them shift to train. It turned out, that participants can be convinced to change mode of transport in favour of more environmentally sound modes, depending on how much the price is increased. Some already mostly travel by train. And only a small minority would never exchange car or aeroplane travelling with train. But in order to make people change, you have to use both stick and carrot:

"My comment is that is has to be both stick and carrot because if cars are taxed there has to be another well-run alternative." (Denmark)

A major obstacle for changing from car or aeroplane to train is the standards of the railways. Especially in Hungary and Greece the participants say that the condition of the trains and railways makes it a bad alternative to taking the car, for instance.

"Ok, to change from car travel to train, but what trains are we talking about? Greece has a limited and rather old fashioned railway network." (Greece)

"The steps of the train wagons running in Hungary are 80 cm from the ground. And it is also a problem for young people, not only for the elderly to get on. … Comfortable and usable railway should be made. … Debrecen (the second most populated city in Hungary after the capital – E.B.) is 240 km away and it takes three hours by train and two and a half by car. … A train is needed which would run to Debrecen in one and a half hour, there should be a comfortable railway station that can be heated, trains with comfortable wagons and prices that aren't higher than by car." (Hungary)

In order to make people shift to travelling by the train, it must be comfortable and worthwhile – and the price is what participants from Denmark, Greece and Hungary rank as the most important argument to make them shift. Limiting climate change is the second best argument for them. Comfort on board the train and that the travel time is the same is also important to the participants.

"It is catastrophic what you can find on the trains! And also, the toilet is disgusting. No food! I don't know, we could make a long list. On the other hand, it is really great to travel by train, because it would be really more comfortable than by plane, and you sit and can stretch your leg." (Hungary)

"One of the reasons for driving more by car is that it may even be cheaper than going by public transport and it is faster than public transport…" (Denmark)

"In my opinion, a lot of people don't take the train, because it's dirty, smells bad and it is full, they have to stand up during the whole trip" (Hungary)

"If the public transport is actually cheaper and more efficient, if the trains arrive on time – if it works, then people would probably prefer this to taking the car, if it actually pays." (Denmark)

Travelling comfortably is important to the Hungarian participants, and they are willing to pay more for using plane and car to avoid the low standards of the train. Even if they saw higher prices for car and rail transport as a way to limit global warming, they argued that travelling by plane could save a lot of time compared to rail transportation.

"One can get there faster by plane. Let's say, in an hour. Yes, let's say, you have one week for holiday, then you don't want to spend four days travelling …" (Hungary)

For freight transport, the train is seen as a good alternative to trucks – and with more unambiguous support than for passenger transport. However, some participants argued that, today, in many cases trucks would be the most efficient and flexible means of transport, depending on where the goods are produced and where the markets are.

"Clearly, if we could move much more of the freight transport to rail transport instead of trucks, it would be a big advantage. The problem is flexibility, since trains can only stop at certain places…" (Denmark)

2.5 Paying for polluting transport

Generally, more than half the participants support paying more for long distance transport to reduce global warming. Most of them are willing to pay ten percent more for long distance transport, while 1 out of 8 are willing to pay 50 percent more. Compared to Hungary (5 percent) and Greece (10 percent), a larger share of the Danes (33 percent) are willing to pay 50 percent more for transport that reduces global warming.

A little less than half of the participants find that travelling by aeroplane or car should be more expensive. When comparing the three countries, a bigger share of the Danes (70 percent) find that travelling by air should be made more expensive while only a smaller share (30 percent) of the Hungarians and Greeks feel it should be more expensive. The same tendency can be found with regard to increased prices on car travels although the Hungarians and Danes are more similar in this respect and the Greeks less reluctant to support increased prices on car travels.

"There is something completely unnatural about that it costs 250 DKK or so to go by aeroplane to Amsterdam, …it cost the same, 250 DKK to go by train to Falster."[150 km south of Copenhagen] (Denmark)

The vast majority do not think that travelling by train should be more expensive.

2.6 The polluter pays principle

Almost all participants agree that the tax system should be regulated in such a way that it is cheaper to buy and run an environment-friendly car and more expensive to drive a car that pollutes a lot.

> *"Taxes should relate to the levels of CO2 emission, so one should pay for great levels of CO2 emissions while another should have reduced taxes for his environmentally conscious behaviour." (Greece)*
>
> *"A more fair taxation system, so that when you really pollute, you also have to pay." (Denmark)*
>
> *"Well, I like the polluter pays principle very much." (Denmark)*

The Hungarian participants also supported the polluter pays principle, and they would not take any social considerations:

> *"Those who use more must pay. This is obvious. … Compensation to the people in worse economic conditions? Those who could buy a car and can use it are not in bad economic conditions. … Moderator: Should the system differentiate in the areas where there is no public transport? Participants: No. No. They also consume petrol." (Hungary)*

However, they were not sure what effect it would have on limiting climate change. They argued that not that many people in Hungary drive in SUV's and other cars that consume a lot of petrol, and those who did would still do it, even if they had to pay a lot for it.

"Those who pollute more have to pay. – We are not that sure about it, because the one who has an I don't know how polluting car which was very expensive, s/he doesn't care at all how much his/ her car is polluting, s/he will drive it the day after again. … It won't prevent him/her from driving. … But in reality, this is a rather small group of people. Not too much money would flow in from that." (Hungary)

Others were very critical towards the polluter pays principle:

"Ok, we will pollute environment and then we will pay for it! Is this a serious solution?" (Greece)

2.7 Paying more for goods

A little more than half of the participants are also positive towards to increased prices on food products in order to reduce global warming, but the price increase should not be too high. The pattern is the same for non-food products, although the willingness to pay more is a little higher (65 percent). And while almost no one can accept increased prices on everyday commodities in general, half of the participants can accept increased prices on goods with a large carbon footprint. In particular the Danes were willing to accept higher prices on goods with a large carbon footprint.

Many participants find that it ought to be profitable to buy local goods instead of imported goods.

"It must pay to buy Danish goods instead of buying goods from far away (…) but you can always take the Danish strawberries instead of the Spanish that is right next to them, and maybe not buy potatoes when it is not the season." (Denmark)

Asked directly, the vast majority says no to a general reduction of freight transport. Some participants emphasize that not all goods can be produced locally and that some countries can produce specific goods very cheap and they should still do that.

"But it's not only the grapes in winter; it's also the olive oil, our traditional product that has to be exported to boost our economy. What happens then?" (Greece)

But then again, they want these goods to be transported by way of the least CO2 emitting means, and they think it should be more expensive to use the most CO2 emitting means of transport:

"I would like the most polluting modes of transport to be most heavily taxed. Meaning that if you drive a tomato in a truck from Spain then it has to be more expensive than if you drive it from Spain to Denmark on a train. Solely because you put more CO2 into the air… They simply have to pay for it!" (Denmark)

"I believe that exchange of goods is healthy and basic need for welfare societies. The point is to tax transportation means according to their CO2 emissions or paying more for products that have travelled many miles. This whole idea needs to be well planned." (Greece)

When discussing the pricing of polluting means of transport, some participants feared that this would be at the expense of the consumers – in the end, they would be billed for the pollution.

2.8 Reduce travel

When it comes to reducing personal travel, the vast majority (81 out of 84 participants) do not think that there should be a reduction in passenger transport. But when they are asked, whether they can personally accept fewer holiday trips and fewer business trips, a third says yes. So while they do not want a general reduction, many of them are willing to take personal consequences in terms of reducing travelling.

The Greeks, however, state that they travel mainly for vacation, for relaxing and they have no intention of changing this need for nothing. They argue that fewer trips cannot save the world.

> *"I am working all year in a totally polluted environment and someone comes to limit my choice of travelling away from Athens twice or three times per year? I am not willing to change this! Sorry!" (Greece)*

The argument of reducing global warming is what can make one third of the participants (approx. 50 percent of the Greeks and Danes and 10 percent of the Hungarians) accept to travel less, while longer travel time will make 1 out of 4 consider travelling less. Easier use of virtual meetings (e.g. by video conference) will make about 40 percent of the participants consider travelling less. In the group debate, ICT is mentioned as a technology that can reduce the need for travel. A Danish participant gave a personal example:

> *"Yesterday I had my first Skype call ever with web cam and all – and suddenly I could see my colleague in the U.S. and I kept speaking with her for 45 minutes…it was fantastic!" (Denmark)*

But virtual meetings, videoconferences and the like are not an option that participants are familiar with in general.

> *"Technology has the possibility to limit some business trips but Greece needs more education on this." (Greece)*

One of the Hungarian participants stated that he would be ready to travel less, if the opportunities of teleworking (working from home) would become better as this type of work is very rare in Hungary.

2.9 Reducing speed

Many participants can accept prolonged travel time if it helps reduce CO2 emission. Reducing the average travel speed by 20 percent for aeroplanes in order to reduce CO2 emission is an acceptable solution for a majority of about 70 percent of the participants, while a little more than half can accept reducing the average speed limit on motorways to 80 km/h.

> *"It appeals a lot to me, partly of course because it can reduce some of the emission, but I also think that we can get some spin off, at least if it is the cars (…) we may reduce many of the traffic accidents there is." (Denmark)*

If the transport is reliable and on time and if security is increased, reduced speed is even more acceptable, while the acceptance of longer travel time for about a third of the participants is increased by better comfort and easier combinations of different modes of transport.

> *"Every year many people die from accidents. We have to reduce speed for our own safety." (Greece)*

"I am willing to prolong my travel time to save the environment but mass transportation has to be more punctual to save me from additional delays!" (Greece)

On the other hand, time can be a factor when choosing means of transport:

> "*Time has become such an important factor in our everyday life, so often you are not willing to spend more time in order to save the environment." (Denmark)*

2.10 Better information

The participants in all three countries emphasize the need for better information about CO2 emission from long distance transport to help them in their daily doings. Long distance transport and CO2 emission is not an issue they think about daily, but if the information was there when they are shopping or travelling, many of them say they would act on it.

> *"There are many things that I really don't think about when I go shopping." (Denmark)*

> *"That's for sure that we are not that informed in Hungary that we could take into consideration these many opportunities." (Hungary)*

A good example of this kind of information is the carbon footprint that many of them would like to see on daily necessities as for example foods.

> *"It would make us think and consider what we are actually buying, but this may not change our choices eventually." (Greece)*

> *"I'm not thinking about how many kilometres some product has travelled before it reaches the supermarket shelf. I think it is an on-going process towards people getting more informed and aware of the significance of long distance transport." (Denmark)*

Some participants also pointed to how difficult it could be for the consumer to act on the basis of a lot of confusing information, and therefore the choice of behavioural change based on information is not that simple.

> *"It is very difficult to navigate, as a consumer…you think you do the right thing, and then you learn that this turned out to be wrong." (Denmark)*

> *"There is an immediate need for more and better information because reducing travel is absolutely beyond our intentions, for example." (Greece)*

2.11 Conclusions

- There is a strong confidence in technological development among the participants, and they believe that the problems of CO2 emissions from long distance transport should primarily be handled with technological solutions.
- The Danes also want to motivate citizens to change their behaviour in a more sustainable direction, while the Greek and Hungarian participants did not give this alternative much of a chance; it is very difficult for people to change life style, they think.
- In line with this, the Danes may be more receptive to pricing as a way to force people to change behaviour, and they argue for both stick and carrot. The Greeks and Hungarians reject the idea of increasing prices; they want more carrot than stick.

- All participants however seem to agree, that the technological options need a push to be developed and implemented.
- All participants are against general increases in transport price, but they can accept higher prices in relation to the size of the goods carbon footprint. They can also accept a smaller variety of goods from abroad.
- Modal shift from car or aeroplane to rail transport/train seems to be more attractive to the Danish participants, in particular if high-speed rail becomes an option. The Hungarian and Greek participants refer to their bad experience with national rail systems and would only shift from car and plane to train if travel by car or plane was twice as expensive as travel by train. Further comfort and punctuality would make trains a more attractive option for passenger transport.
- To move freight transport from trucks to rail was met with major support among the participants.
- Participants do not want a general reduction in passenger transport nor in transport of goods, but when it comes to their personal willingness to forgo travels and goods, they are more prepared.
- The polluter pays principle is supported by the majority as a fair principle, though some fear that it will have little impact on CO2 emissions.
- To compensate for social inequities is not supported by the Hungarians, even for people living in rural areas. They argue that if one can afford to have a car, one should also pay the same as others to use it. This attitude to road pricing is quite different from the attitude of the Danes.
- Reducing travel by introducing virtual meetings is an option, but seems too futuristic to be really taken on board by the participants.
- Reduced speed for aeroplanes and cars is widely accepted in all three countries. Reliability and punctuality (arrives on time) and traffic safety will support the acceptance.
- More information is asked for, however, the participants warned against too much confusing information.

3 Policy measures and responsibility

3.1 Overall attitudes towards different policy measures

The participants were asked to assess different policy measures. They were most positive towards information, specifically a carbon footprint label and a bio fuel label, and they were more reluctant towards road pricing and taxation measures. In the group debates, many participants argued against paying higher taxes – they find that the pressure of taxation is rather high as it is.

> *"Do we want another tax? Others say and I also say that it is enough." (Hungary)*

> *"I don't believe that taxes will save the world or contribute to less CO2 emissions." (Greece)*

But some – especially the Danish participants – do support the idea of taxing for the benefit of the environment; only compensation in lowering taxes elsewhere should ensure the balance.

> *"In principle, I would like to pay more in tax if it benefits of the environment. Then the tax should be lowered in other places – I mean a re-distribution (re-allocation) of taxes." (Denmark)*

3.2 Road pricing

A little less than half of the participants from all three countries find road pricing to be a good policy measure for reducing CO2 emission from long distance transport. But they also emphasize that road pricing should be accompanied by a reduction in other taxations. The Danish participants are the most positive towards road pricing. Here two thirds of the participants stated that they find road pricing to be a very good or good tool for reducing CO2 emissions. The share of Hungarian participants in favour of and against road pricing is almost the same (around 40 percent). A third of the Greek participants find road pricing neither good nor bad, and slightly more participants dislike the measure.

> *"For me, road pricing is OK, but then we need to get rid of vehicle excise duty." (Denmark)*

> *"These cars that pay road pricing, a rake-off let's say, it is incorporated into the product at the end, and we will pay more in the shop. After all, the amount of levying road pricing will fall back again to us. … The solution is not that I impose road pricing, but that I build two new bridges." (Hungary)*

> *"The Greeks will always find a way to escape the law, so this measure is rather indifferent except if regulations are very strict." (Greece)*

In the group debates, some emphasize road pricing as a measure intended not only to reduce CO2 emissions, but also to reduce congestion in urban areas, saying that perhaps it is better suited for that.

> *"I prefer this measure for urban roads because I don't know how it will work on long distances." (Greece)*

> *"I think it solves the problem in the city neighbourhoods but I don't believe in it on long distance. But it is a good idea in the heavy traffic." (Denmark)*

Road pricing was not too popular in the group discussion at the Hungarian interview meeting. Some participants argued to improve the infrastructure rather than imposing another tax on the citizens, if the purpose is to solve congestion problems.

3.3 Individual carbon allowances

Also slightly less than half of the participants find individual carbon allowances to be a good policy measure, and here the Greek participants were most positive (64.5 percent). Some participants find it good because it counteracts the social inequality that they perceive as a side effect of carbon tax in general. The Hungarian participants are the least positive towards individual carbon allowances as a policy measure; only 1 out of 5 support it. They don't trust that it will have an effect in reducing CO2 emissions.

> *"An individual CO2 allowance to distribute it. Because if you only do it by tax, then the people with most money… then it will have an unequal effect." (Denmark)*

> *"It's good because it refers to each one separately and forces him to be careful in relation to CO2 emissions." (Greece)*

> *"Individual carbon allowances… The situation is that if his/ her emission is higher than s/he will be penalized and s/he will pay the penalty, but reek remains reek and we will still not get fresh air." (Hungary)*

3.4 Carbon tax

Exactly half of the participants (from the three countries together) find Carbon tax to be a good political tool. In Denmark and Greece, two thirds answered in the "very good/good" category compared to 20 percent of the Hungarians.

Judging from the group debates, it seems that some participants find it difficult to understand carbon taxation, and whether it could have a different impact on CO2 emission than road pricing. The Danish participants pointed out that they could accept carbon tax from a polluter-pays-principle, meaning that transport with a high CO2 emission could be taxed, while there should be compensation/benefits for less CO2 emitting transport. This would leave the passengers with a choice. The argument is in line with their opinion of pricing (tax and charges) in general.

At the Greek interview meeting there was a discussion about carbon tax and both the effect and the fairness of the measure was questioned, even though a majority of the participants were in favour of carbon tax. They would rather tax corporations and industry that pollute the environment much more than individuals do. They talked about groups of people (poor people, farmers, unemployed, senior citizens etc) for who there should be an exemption, as their level of responsibility is almost insignificant or because their socioeconomic status cannot afford additional taxes.

> *"Industry and corporations pollute nature much more than individuals and I find it totally unfair to pay for something I have too little responsibility for." (Greece)*

> *"Simple and innocent citizens pay for everything. It's time to protect them, especially some groups, from taxes that don't concern them exclusively." (Greece)*

3.5 Carbon footprint label

The most popular tool among the participants is the carbon footprint label. The majority of the participants in all three countries find it to be a good tool.

> *"Maybe you could have these carbon footprint labels on goods. I, for one, am not aware of how far a product has travelled. Some things which have travelled far you have to buy, but other things you might be able to prioritize a little different if you were aware of it."(Denmark)*

In the group debates, the need for information on the carbon footprint and the transport history was widely discussed. On the one hand, participants stressed that the information on country of origin is mostly available. But this does not necessarily make consumers aware of the carbon footprint.

> *"It would make us think, it would force us to react and consider what we are actually buying." (Denmark)*

> *"It would make us think and consider what we are actually buying but this may not change our choices eventually." (Greece)*

The bio fuel label was also seen as a good tool for informed consumption by more than two thirds of all the participants.

3.6 Bio fuels could be problematic

3 out of 4 participants find it problematic, if bio fuels are produced at the cost of foods. But then again, they have faith in the technological development also when it comes to bio fuels.

> *"I have heard that bio fuels are made from cereals. I cannot accept people dying from hunger while modern Western societies are looking for alternative ways of transport." (Greece)*

> *"We can cultivate goods especially for this purpose without depriving people that really need them." (Greece)*

> *"(…) And then they say that it is at the expense of foods that you grow fuel on the fields, but that is first generation, if it is second generation it is produced from waste and that I definitely support." (Denmark)*

3.7 Political responsibility

The participants were asked who they felt should have the main responsibility for reducing CO2 emission from long distance transport in the future. The biggest part (almost 40 percent) of the participants indicate that the challenge of reducing CO2 emission from long distance transport should be handled on a European level.

Considering each country in turn, the Hungarian participants' opinion is markedly different from that of the Danish and Greek participants. Half the group thinks that corporations and industry should be made responsible for reducing CO2 emissions, and only a small part will give EU the biggest responsibility. 10 percent of the Hungarians find that the EU have the primary responsibility for reducing CO2 emissions from long distance transport compared to 40 percent in Greece and 66 percent in Denmark. Both the Hungarian and Greek participants give the individual citizen a larger responsibility than the Danish participants do.

However, the European Union gets strong support from the Hungarian participants when the question concerns political responsibility in organizing the infrastructure and making decisions in favour of reducing carbon-dioxide emissions from transport.

Participants from all three countries are very much in line when listing arguments for and against placing transport decisions at EU level. Participants argue that all of Europe must act together. It is no good that one country reduces CO2 emission if another goes on polluting as before. They also talk about CO2 emission as a global rather than a European challenge.

> *"Without a proper and coordinated policy for all of EU, I find it hard to see how we can deal with the global problems." (Denmark)*

> *"Here is the European Union. Yes. But the authorities, the national authorities, these factories make a significant part of the GDP, so…?" (Hungary)*

> *"I can see real changes only if joint efforts take place, without regard for personal profits." (Greece)*

> *"Global warming is a worldwide problem and concerns us all." (Greece)*

Half of the participants in the three countries state that decisions about European transport systems should be made at EU level rather than national level, and the vast majority believes that EU regulation is necessary to ensure efficient planning of land use infrastructure (cross-border rail network, cross-border road network, airports).

> *"I also think that it should be governed by the EU, that they fix it by law. There shouldn't just be a policy with some declarations of intent of the ways they want to limit global warming. It must be fixed by law so that it will have an effect and we act on it in the member states." (Denmark)*

Also the vast majority of the participants believe that it is necessary to move more power from the states to the EU in order to enable a European-wide standardisation and regulations that will make the transport system CO2 lean.

> *"All European politicians have the main responsibility of managing these problems that concern all humanity." (Greece)*

> *"I would give the politicians the overall responsibility. If we are to change society, the individual citizen, the industry… then the initiative should come from the politicians. No matter if they are red, green or black. If the question is as important as we seem to agree around this table, then the national parliament must understand it too and change attitude and say in agreement: We will go in the direction that will be the best for Denmark, for Europe and finally global." (Denmark)*

During the group discussions, a critique was raised of the responsible politicians and decision makers. Especially Hungarian participants expressed that they had not noticed any efforts by their national leaders and authorities to make improvements in this field.

> *"The approach of the responsible leaders, state institutions and ministries is missing. They are a bit neglectful. I mean, it cannot be noticed that they try to do anything in favour of reducing this terrible amount of truck traffic." (Hungary)*

> *"At state level, those who should deal with this, they don't deal with it." (Hungary)*

> *"I blame politicians for all these problems; not only the Greek ones but also those of the European Union." (Greece)*

"I strongly believe that if politicians really wanted to change the situation, this could easily happen. But I don't see anything changing and I am not sure of their motives." (Greece).

3.8 Industry responsibility

A third of the participants find that corporations and industry (car manufacturers, flight operators, freight companies etc.) must have the main responsibility and make and keep voluntary agreements to develop more environmentally sound technology. As mentioned, almost half of the Hungarians answer that corporations and industry have the biggest responsibility. This share is a quarter for Greece and Denmark.

But the majority of the participants do not believe that industry will live up to that responsibility:

"It is utopian to believe that business like that can have conscience. The politicians will have to regulate it." (Denmark)

"*I am afraid that one should push very hard before industry will do something that they will not benefit directly from." (Denmark)*

"It's very hard to believe that industry and corporations will change their attitudes and policies. They care only about profits." (Greece)

"Money ranks higher than environmental conscience." (Greece)

Some suggested that pricing, taxes, charges, propositions, carbon allowances and carbon footprint label may motivate industries to do something in case the government is willing to implement all these measures.

"*If politicians don't take the responsibility to impose measures on industry, nothing is going to change." (Greece)*

3.9 Individual responsibility

Some participants are aware of their personal responsibility. A relatively large share (12-17 percent) of the Hungarian and Greek participants considers the individual to carry the main responsibility for reducing CO2 emissions. During the group debates, the Danish participants talked a lot about personal responsibility, while the Greek participants expressed that the individual does not have much of a chance of influencing big issues like CO2 emission and global warming.

"But we also have to go down to the individual citizen in the individual country, who has to make the right choices when buying cars and everyday necessities and (…) travels." (Denmark)

"I still cannot think that individuals have the main responsibility for environmental pollution, as industry and corporations don't respect environment." (Greece)

Some argued for the responsibility and power of the individual as a voter and as a consumer.

"At the end of the day, the responsibility can only be our own. In principle, the politicians have to do what we tell them to." (Denmark)

3.10 The role of the politicians is crucial

Thus, the participants do not leave all responsibility to the politicians; they see themselves as important actors too. Yet they point to a need for guidance, a need for political governance in this field. In the group debates at the Danish interview meeting, the participants talked about politicians as role models.

> *"I think that it is very important to have some role models, for example our ministers here and in the EU." (Denmark)*

Politicians should support changes in behaviour with legislation.

> *"Each individual should do what she finds is in line with her conscience. But it can seem a bit chaotic, if you think you do the best you can, but nothing really happens, there are no changes of legislation that support it." (Denmark)*

The Greek participants worry about the Greek way of thinking and acting as far as environmental considerations are concerned. They also point to a need for guidance, a need for political governance in this field, because politicians have the power to play a determinant role in environmental protection.

> *"Ok, I want to help to this issue but if the Government cannot give me the right directions, nothing is going to happen." (Greece)*

> "*As a Greek citizen, I want to ensure that I am not the only one that tries to save the world, I want to know that legislation concerns everybody without discriminations and exceptions, for the cousin of the Minister for example." (Greece)*

Almost all of the Greek participants were sceptical towards the politicians' motives and they were wondering why they are so reluctant to implement strong regulation e.g. of the car industry, to make them produce more energy efficient cars. This line of reasoning was represented in all three countries.

> *"I strongly believe that if politicians really wanted to change the situation, this could be easily happen. But I don't see anything changing and I am not sure of their motives." (Greece)*

> *"Government should say: If you produce these cars, then we will do this and that and put a tax on it, and suddenly it will pay off to produce [energy efficient] cars…" (Denmark)*

> *"Politicians must think about what is best for the country, so I am wondering what the argument is for not doing it." (Denmark)*

Also the Hungarian participants were very sceptical towards the politicians and authorities. Many Hungarians distrust national authorities and institutions, and this atmosphere of suspicion has been intensified by recent scandals where it turned out that many shopkeepers in Germany and Hungary changed the labels of the products to show that these were supportable and saleable longer than they really were. It was especially bad in the case of meat products.

3.11 How should future investments be prioritized

When asked to prioritize the future investments in long distance transport, more than 80 percent of the participants point to research and development of new CO2 lean technology. The participants in the three countries are also very supportive towards investments in Intelligent Transport Systems (75 percent) and improvement of European railways (63 percent).

There are some differences in how the three national groups of participants prioritize regarding rail, high-speed train and road investments.

Almost all the Danish participants support investments in rail, (87 percent), while the Greek and Hungarian participants are not as supportive (48 and 58 percent). However, the Hungarian and Greek participants are more convinced of the value of high speed trains than the Danes (45, 45 and 17 percent) - altogether every third participant wanted investments in high-speed trains, and 1 out of 4 wanted investments in new roads. The Hungarian and Greek participants are more supportive of new roads, which slightly more than a third of the participants gave priority, while only 1 person from Denmark prioritized new roads.

All participants were against new airports - none gave this investment priority.

When asked more specifically what they are willing to pay more in taxes for, the pattern is the same but the willingness is not as high, and 1 out of 3 state that they do not want to pay more in taxes. Confidence that the individual contributions, and not least paying taxes, would make a difference in limiting global warming was mentioned as a precondition.

> *"I think we lack some information that could help us make our choices. As a starting point, I would be prepared to pay more for the goods, if I felt confident that this would actually help reduce CO2 emissions or pollution in general." (Denmark)*
>
> *"I am willing to pay more for goods or to change my behaviour if someone can convince me that global warming will be reduced." (Greece)*
>
> *"We pay all the time for something but I really doubt about the right investment of my money." (Greece)*

When asked what the revenue accrued from road pricing should be used for, there was a little higher (a third) proportion of the participants giving priority to new roads. None of the Danish participants, but almost half of the participants from Hungary and Greece, prioritized spending the revenue from road pricing on new roads. However, investments in research and development of CO2 lean car technology is given the highest priority, followed by ITS and rail ways – in line with what solutions they believe most in.

In the group discussions, the Greek participants pointed to the need for more roads, bridges and tunnels in Greece.

> *"If we want better transport in Greece, we have to focus on improvement of national road network. In this case, I would be more positive to be taxed." (Greece)*

The participants were also asked what the revenue from carbon taxation should be spent on, and here the options of prioritizing research and development of CO2 lean sea or air technology were both supported by two thirds of the participants. Half of the participants also wanted to spend money from carbon taxation on ITS and railways.

Many participants stressed, that the different modes should play together in an efficient way – and this should also be a focus for investments.

Some - mainly Danish - participants saw high-speed rail as a good alternative to travelling by aeroplane, but most of the participants stress the need to improve the European railway system in general.

> "*… A (high-speed) train that connects the larger cities of Europe, that would be very flexible compared to air transport. I could see huge benefits in this." (Denmark)*

> *"I am disappointed that the EU has not been more far-seeing when it comes to transport on railways. It is something they should prioritize much more, rail transport." (Denmark)*

> "*We talked today about shifting from aviation and car to trains. We are in Greece! Railways are too slow and old fashioned to meet these needs." (Greece)*

The Hungarian participants complained about the standard of national railway services in the group debate as a reason for not prioritizing investments in this mode of transport. Some of them also expressed their worries that railways use a lot of power and people do not know if this power was produced in a way that is totally environment-friendly.

> *"Railways should be improved, but it does not solve the problem of CO_2-emission and wastage, because railways also need a certain amount of power. There is nuclear power and then nuclear waste that we cannot dispose anywhere. We are in a situation where there is always something wrong." (Hungary)*

Some of the Hungarian participants also mentioned that the governments should pay more attention to improving the road network and the highways than to develop the railway system.

> *"They are constructing highways with a huge effort. If water and railway transport could be developed by this, then basically, everybody would choose these." (Hungary)*

Finally, more information to raise awareness of long distance transport's contributions to global warming was strongly emphasized by the participants.

> *"…Yes, and information, it is also an important investment." (Denmark)*

3.12 Conclusions

- More information to the citizens on the consequences of transport for CO2 emissions, specifically a carbon footprint label and a bio fuel label, and more research and development in CO2 lean transportation are the most popular policy measures among the participants in the interview meetings in Greece, Hungary and Denmark.
- Road pricing is accepted by a slightly less than half of all the participants - two thirds of the Danish participants consider it a good policy measure. Some find the measure to be most relevant in urban and congested areas.
- Individual carbon allowances and carbon tax is seen as a good measure by almost half of the participants. Here, the Greek and Danish participants are by far the most positive; with the argument that such measures are more equal and help highlight responsibility.

- In general, the participants in the three interview meetings are not in favour of using carbon taxation in order to reduce CO2 emissions. They find the tax burden to be high as it is, and some doubt that it will have the desired impact. However, when asked specifically about different types of taxing and pricing measures, around half of the participants tend to support it, the Greeks and the Danes being the most positive.
- The participants in general perceive a need for joint efforts in the EU - and globally - to fight global warming. Thus, the EU is seen as the important actor in governing the transport sector towards reduced CO2 emissions. They were even prepared to move more power to the EU to enable standardisation and regulation that will make the European transport system CO2 lean.
- When asked whether national governments or the EU should take decisions regarding reducing CO2 emissions from long distance transport, half of the participants point to the EU. The role of the EU is stressed even more when it comes to cross border infrastructure planning.
- It is noteworthy that both the Greek participants and the Hungarian participants distrust their political leaders and the public authorities. Often they give this as a reason for not wanting to pay more taxes. The Danish participants seem to have better experience in this field.
- When pointing to who has the main responsibility of reducing CO2 emission from long distance transport in Europe in the future, the European Union is picked as the most important actor. The Hungarian participants, however, find that industry carries the main responsibility. The group discussions reveal that many participants do not trust industry to live up to its responsibility.
- Many of the participants, in particular the Danish, feel a great personal responsibility for reducing CO2 emissions. However, they stress that leaving the initiative to the individual will include the risk of a chaotic response to global warming. Citizens need support from politicians - role models and guidelines are asked for.
- Investing in research and development of CO2 lean transport technologies is given highest priority from a very large proportion of the participants in all three countries (more than 80 percent). Second comes investments in ITS, and rail investments are third.
- The Hungarian and Greek participants are more critical to rail investment, arguing that the current conditions are very bad and thus that it thus does not seem to be an attractive alternative. Furthermore, they are not convinced that it will be a solution to the problem of reducing CO2 emissions; some fear that nuclear power will be used for electrification of trains.
- Both the Danes and the Hungarians are critical of the negligent attitude on the side of the authorities as far as maintaining and improving the rail network is concerned.
- It is noteworthy that no participants - zero respondents - support investing in more airports in Europe.
- The support for investments in new roads is rather low as well, with Hungarian and Greek participants being more in favour of this, in particular for using the revenue accrued from road pricing.

4 Additional points

4.1 Change in attitude towards long distance transport

The vast majority of the participants state that they have changed their attitude towards long distance transport by being part of the interview meeting. While most Danish participants in the questionnaire answer that they have not changed their attitudes, in the group debates several participants stressed that they had learned a lot and that they wished more people could be engaged in this type of debate.

> *"It has opened my eyes a little towards how these global problems should be tackled politically." (Denmark)*

3 out of 4 of the Greek participants and two thirds of the Hungarian participants answer in the questionnaire that they have changed their attitude.

Most of the Greek participants felt more worried about what they have read and learned from this interview meeting. Specifically, they said that there was a lot of information they had never heard of. They felt very lucky that they had been given a chance to participate in this interview meeting and wished more people could be engaged in this type of debate. Global warming is a rather complicated issue and concerns all of us individually, nationally and internationally.

> *"I was really surprised by what I heard today and I really feel more worried about my own responsibility."(Greece)*

> *"But I still believe that the transport sector is only a part of the problem."(Greece)*

Half of the Hungarian participants had become more worried about global warming and the transport contribution to this, and many felt they needed more information on the issue. They find it difficult to be aware of the problems of CO2 emission if people do not know the reasons and connections behind the key words and campaign slogans.

> *"I am quite certain that I will be shopping totally different from now on and that I will think more about from where goods were transported." (Hungary)*

> *"My opinion has changed, I learned certain things. But not too many people are aware of this, or why it happens. They can hear about global warming, they note it and then life goes on." (Hungary)*

Annex

Annex overview

The following is included in the annex (separate):

- Annex 1 – Method handbook
- Annex 2 – Information material
- Annex 3 – Questionnaire and interview guide
- Annex 4 – Frequency tables

Annex 1 – Method handbook

STOA Transport Interview Meeting Manual

Description of interview meeting

By The Danish Board of Technology (DBT)

1 Intoduction

1.1 Summary of the STOA Transport Project

Long distance transport will face some serious challenges during the next 20-40 years regarding sustainability, oil dependency and accessibility. This STOA project on long distance transport identify the policy measures for achieving a 60% reduction in CO2 emissions and 80% reduction in oil consumption compared to 2007 without reducing accessibility. This is done in a back casting scenario process that includes the relevant timing of introducing the policy measures within the 40 years period.

It is very likely that technological solutions alone will not make it possible to meet the targets. Change of behaviour in terms of travel pattern that can be supported by pricing measures changes in consumption, working and lifestyle etc is included in the scenarios as well.

Thus the scenarios include trade-offs in individual and societal limitations of long distance transport in exchange for sustainability. The acceptance of the scenarios therefore involve normative considerations. These considerations are facilitated by an overview of the preferences made by sets of European citizens in a cross-European citizens' assessment of the scenarios. This is performed through "Interview-meetings", which involve qualitative and semi-quantitative data selection from national citizen panels – as more detailed described in this manual.

1.2 Introduction to the present manual

"Human factors" play a big role when shaping and applying new technologies and priorities to the long-distance transport sector. As a part of the STOA Transport Project citizen participatory activities – each involving about 30 citizens – will be carried out in three European Union member states – Hungary, Greece and Denmark. The purpose is to establish a combined quantitative and qualitative insight into public perceptions.

This part of the STOA Transport Project (phase 3 of the project) will provide insight into the public perceptions and citizens' preferences based on the scenarios that are developed in the phase 2 report of the project.

The participatory methodology for phase 3 is "the interview meeting". The interview meeting includes a questionnaire and a subsequent group interview.

This manual describes the methodology of the interview meeting. It further describes what to do when carrying out an interview meeting – step by step.

1.2.1 Who is the manual for?

This manual is designed for the partners and subcontractors that will carry out the interview meetings in connection with the STOA Transport Project. The manual helps define the division of work and each partner's responsibility, making it possible for partners to efficiently plan their work, taking into account the workload and making sure that personnel with the necessary qualifications is available.

1.2.2 Overview of the manual

Chapter 2 is a general description of the method combined with more specific descriptions of how it will be implemented in the STOA Transport Project. Chapter 3 focuses on the people involved in the interview meeting and chapter 4 is a step-by-step guide on how to carry out the interview meeting in the STOA Transport context, as well as a timeline for the whole process, including preparation.

2 The interview meeting

2.1 What is an interview meeting?

The interview meeting is a method to gain knowledge of what a group of people think and feel about complex technologies. It is not a representative method but it aims at including a diverse group of citizens who cover a broad spectrum of demographic criteria such as age, sex, education and occupation.

Using group interviews and a questionnaire, a group of about 30 people are asked at the interview meeting about their perceptions and preferences in relation to a technology, a technological development, challenge or problem. As a rule, interviewees do not possess any expert or professional knowledge about the technology under exploration. However, prior to and during the meeting, the participants are informed about the advantages and disadvantages of the technology so that they share a balanced and factual starting point. In the STOA Transport Project, this information is based on the scenarios developed in the phase 2 report.

The interview meeting method employs a combination of a questionnaire and group interviews. These two methods complement one another well; the questionnaire ensures that all the participants are heard and that there is comparable data relating to the most important areas. The group interview, on the other hand, creates a lively debate and ensures that the participants can include aspects that are not addressed by the questionnaire. Interview meetings are particularly suitable in cases where:

- There are complex issues (technically complex and/or ones posing dilemmas)
- Prior public knowledge is limited
- An ethical dimension is involved

2.2 The purpose of the method

The purpose of the interview meeting is to gain insight into the various notions, wishes, concerns and attitudes prevalent among the interviewees. The interview meeting must provide an indication of the general views of the interviewees and the underlying reasons for these. The purpose is thus not to conduct an actual opinion poll. The interviewees' answers provide insight into:

- Fundamental attitudes towards a given technology
- The underlying reasons for these attitudes
- The variety of arguments that exist among the interviewees
- How citizens weigh different arguments and ethical principles against one another

The purpose of the interview meetings is to get citizens' feedback on the dilemmas, priorities and attitudes towards policy measures that are described in the scenarios. The questionnaire and the interview guidelines combined with an analysis guideline will decide the more specific focus of the interview meetings. The development of the questionnaire, the interview guidelines and the analysis guideline is coordinated with the development of the scenarios.

2.3 Procedure description

The interview meetings are held in the respective national languages. Scenarios, questionnaire and interview guidelines must be translated from English to the respective national languages prior to the meeting – if necessary by a professional translator. After translation, the material must be reviewed by a security technology expert who can correct the technical terms that a translator may get wrong. The material should also be evaluated with reference to possible national or cultural differences.

2.3.1 Before the meeting

The interview meeting is held in the evening and takes the form of a three-hour after-work meeting. Two to three weeks before the interview meeting, introduction material is sent to the participants along with practical information about the interview meeting. The scenarios will give the participants an insight to security technology and privacy issues, as well as the dilemmas connected to the subject and what is for and against the different technologies.

In addition to the written material, the meeting begins with an introduction to the scenarios and dilemmas.

2.3.2 Expert presentations and time for questions

The interview meeting begins with an introduction. The introduction is presented by one or more experts in the field. Following this, participants can put clarifying questions to the presenters. Alternatively the presentation is given by the organizer, but questions from participants are still answered by the experts.

In the STOA Transport Project it is important that the introductions and answering of participants questions are as similar as possible. The citizens should as far as possible get the same information in the different countries.

The presentation will be done by a national expert on security technology and privacy issues or by the organizer. The expert/organizer will present the multiple aspects of the scenarios in an oral introduction. A template for the oral introduction will be developed by DBT and translated to national languages (by the organizer). That insures that the introduction includes the same aspects in all the interview meetings. After the introduction, the participants can ask questions to the expert. The answering of the participants' questions can differ from country to country and consequently the information to the citizens may differ. To avoid to many differences the national expert shall be introduced properly to the STOA Transport Project, the scenarios as well as the concept of the interview meeting.

The organizer in the final report shall sum up questions and answers

2.3.3 Questionnaire

After the introduction, participants are handed the questionnaire. Participants have 30-45 minutes in which to complete the questionnaire. The questionnaire focuses on the same dilemmas as the scenarios. Questions can be put to the organizers or the experts throughout the session if necessary.

2.3.4 Group interviews

After the questionnaire, participants are divided into four groups of 6-9 people and group interviews are subsequently carried out. The group interviews focus on the same topics as those of the questionnaire. The group interviews are tape-recorded and follow an interview guide but smaller variations are allowed. The interviews are monitored by an interviewer whose task is to ensure that all of the participants are heard and that all themes and questions are discussed and answered. The group interviews last one hour.

2.4 Results

An interview meeting provides both quantitative and qualitative results. Questionnaire answers provide comparable, measurable, quantitative results and the group interviews are used to gather the more qualitative results that give nuance to those of the questionnaire. Comparison and analysis of the two sets of results offer a balanced indication of public attitudes towards a given technology. After the meeting the group interviews are transcribed and statistics on the questionnaires are prepared. In the final analysis the quantitative and the qualitative data is combined.

2.4.1 Indirect results

The interview meeting creates debate and participants gain new knowledge about – and often a new interest in – the topic. Participants often continue debating the issue with their acquaintances.

2.4.2 Handling the results in the STOA Transport Project

In the STOA Transport Project the results of the interview meetings will be analyzed by each partner/subcontractor on the basis of an analysis guideline so that the national results will be comparable. The reports shall offer an analysis of both the qualitative and quantitative results. The report shall also contain a transcript of the group interviews and a list of questionnaire responses. All reports and results shall be presented in English, except the transcript of the group interviews, which does not have to be translated into English.

The results will basically give insight into the participating citizens' priorities and their evaluation of dilemmas connected to security technology and privacy. The citizens will give their unique input from their "citizen logic".

The national reports will be compared in a synthesis report made by DBT. The aim of the synthesis report is – as far as possible – to compare the results of the national interview meetings.

The involved partners will review the synthesis report.

3 Necessary qualifications

3.1 The various roles and necessary skills

3.1.1 The role of the Danish Board of Technology

DBT will support the organizers by the present manual. DBT will also:

- Develop interview guidelines and questionnaire
- Develop guideline for data processing and report
- Write experts introduction template to participants at interview meeting
- Make a template for invitation, confirmation and refusal letter
- Collect quantitative material from all interview meetings and run them through SPSS before sending the data back for analysing
- Write the synthesis report build on the national reports

3.1.2 Organizers

Each national partner/subcontractor will function as organizer in carrying out their national interview meetings. Overall this means responsibility for preparing and running a national interview meeting. This includes a number of tasks that is described further in the chapter 4. Basically it requires that the organizer:

- Has experience in the planning and running of a workshop
- Has experience in conducting qualitative group interviews and can engage four trained interviewers and one or two long distance transport experts
- Has experience and academic qualifications in analyzing both qualitative and quantitative data
- Is trained in English at scientific writing level

It also requires that partner/subcontractor is:

- An independent non-stakeholder
- An established organization

3.1.3 Interviewers

Four trained interviewers are present at the meeting to conduct group interviews. These interviewers must have experience in conducting qualitative group interviews.

The interviewers must also be informed about the method as well as the STOA Transport Project at a face-to-face meeting with the organizer prior to the interview meeting.

3.1.4 Expert

A long distance transport expert shall be present at the interview meeting to do the introduction to the scenarios and answering questions from the participants. The expert should be balanced in relation to the subject. The expert should also be informed about method as well as the STOA Transport Project prior to the interview meeting, and the expert can also be used when evaluating the translation of the scenarios.

3.1.5 Participants and recruitment

The recruitment of citizens is an important aspect of the legitimacy of a participatory initiative. The process needs to be effective in terms of its consistency so that results are comparable, and it needs to be a transparent process so all participants are aware there are no vested interests being pursued. The process should also be effective with regards to cost and response rate.

About 30 people take part in an interview meeting. Participants at an interview meeting will never be a representative cross-section of society. However, as the aim of the interview meeting is to determine attitudes among the general population, selection should focus on those candidates offering the best possible representation (variation) in terms of age, gender and education. The selection should also take into consideration that there is a variation in employment and that participants have no special prior knowledge of the topic of the interview meeting (e.g. no experts on privacy or employers from security technology companies).

The participants are selected on the basis of the applications from invited citizens, and should as far as possible be based on the following matrix:

Selection matrix

	18-34 years			35-54 years			55 + years		
Men									
Women									
	l	m	h	l	m	h	l	m	h

L = low education (secondary school, leaving age 15/16)

M = medium (college or equivalent; leaving age 18)

H = higher education (university or equivalent)

It is important that there are at least 25 participants. There are almost always some registered participants that do not show up on the day of the interview meeting (normally app. 10 percent). To make sure that there is at least 25 participants the organizer must have at least 30 registered participants and at best 35.

Recruiting the citizens should be done by sending out an invitation letter to 2000 randomly selected citizens (addresses). The random selection of addresses is within the capital (or regional capital) centre and surroundings (meaning within up to the radius of approximately 100 km from the city hoisting the interview meeting).

The invitation shall be send out along with a short presentation of the project and the interview meeting, a reply form and a return envelope. The reply form asks for information about age, gender, education, employment and prior knowledge to the subject. There should be a relatively short answering deadline (e.g. two weeks).

If more than 35 citizens register, the participants will be selected on the basis of the matrix above.

If sending out 2000 invitations does not provide 35 registered participants, the organizer must proceed inviting citizens by selecting 100-200 random telephone numbers and calling citizens personally to make them interested.

If there are still not 35 registered participants, citizens can be invited by the co-nomination method, where invitation starts in the organizers own personal network and is spread out from here.

4 What to do – step by step

4.1 Find location

At an early stage the organizer must find the location for the interview meeting. The location should offer one room (app. 50 persons) for the plenary sessions and 3-4 smaller rooms for conducting the group interviews. All rooms should be available from app. 2 hours before the meeting for preparation (testing recording equipment etc.) and until the end of the meeting. The location must also be easily accessible for participants, e.g. close to public transportation, and services such as food and beverages should be provided.

4.2 Translate all material into national language

All material (15-20 pages) is to be translated from English to the organizers national language. If necessary the partners must hire a professional translator. The material includes invitation template (and other letters), questionnaire, interview guidelines and scenarios.

4.3 Run a small pilot test of the questionnaire and the interview guideline

Before the interview meeting, partners must run a small pilot test to investigate whether the questionnaire and interview questions is understood or not. The partners report the results of the pilot test and possible need for changes back to DBT.

4.4 Recruit citizens for national interview meeting

Each partner or subcontractor must recruit 35 participants according to the guidelines made by DBT.

4.5 Arrange and carry out national interview meeting

Arranging and carrying out the interview meeting involves a number of organizing tasks, e.g. finding location, providing food and beverages, finding one or two persons who can introduce the scenarios, finding 4 interviewers, make sure the A/V equipment and other technique is in order.

As a separate task, organizers must hold an eye on public debate and the media to register if there is any security or privacy issues that might affect citizen’s attitudes at the meeting. This should be done the last two weeks prior to the interview meeting.

4.6 Complete the national data processing

After the interview meeting partners must complete the data processing. Data processing includes transcribing the group interviews, analyzing both the qualitative data from the group interviews and quantitative data from the questionnaire. The quantitative data from the questionnaire is sent to DBT, who will do the data processing before sending it back to the organizers for further analysis. Analyzing of the data shall follow the analysis guideline made by DBT.

4.7 Write the national report

Each partner describes the results in a national report that will be part of the synthesis report. National reports shall be 10-15 pages of analysis plus a transcript of the group interviews and a list of questionnaire responses. Specific criteria for the national reports will be a part of the analysis guidelines.

4.8 Review the synthesis report

The national reports will be part of a synthesis report. All organizers must review the synthesis report.

4.9 Timetable

Time plan 2008	**Partners tasks**
April 14th - 17th	Find locations for interview meetings. Find people who can carry out and transcribe the group interviews. Find translators for the written material and the transcriptions
April 21st – 27th	Start to recruit citizens. Find people who can do the oral introduction at the interview meeting
May 13th – 19th	Translate interview guide, questionnaire and introduction papers for citizens
May 19th – 23rd	Carry out a pilot test and report back to DBT
May 23rd	Deadline for recruiting citizens
May 26^{9h} – June 6th	Send out introduction papers to citizens
June 9th - 20h	Carry out national interview meetings
June – September 1st	Write national reports (including data processing, transcription of interviews and translation of report)
September 1st	Deliver national reports in English according to guidelines
September 29th – October 3rd	Review Synthesis report and mail comments to the DBT

Annex 2 – Information material

The Future of European long distance transport

Information material for interview meeting

17 of June 2008 from 17 - 20

DSB conference centre Østerport

Folke Bernadottes Allé 7

2100 København Ø

Foreword

This information material is produced to support the Interview Meetings on The Future of European long distance Transport. These meetings are part of a project that The Danish Board of Technology is conduction on behalf of the STOA-Panel at the European Parliament. (STOA: Science and Technology Options Assessment). The objective of the STOA project is to contribute to policy clarification for sustainable, efficient and less oil dependent long distance transport in Europe, including both passenger and freight transport.

The interview meetings focus on long distance transports contribution to CO2 emissions and thus climate change.

The information material includes the following:

- Two articles written by a science journalist given an overview of some of the challenges from long distance transport regarding oil dependency, CO2 emissions and infrastructure expansions to enable mobility
- The stories of John and Maria, illustrating different views on the possible solutions to long distance transport and climate change
- A list of technologies and policy measures mentioned in the stories of John and Maria.

We encourage you to read and reflect upon the articles and stories before the meeting, as many of the questions and much of the discussion at the meeting will relate to the dilemmas presented here. If you do not overcome it all, we recommend reading the stories of John and Maria.

The information material is based on a report produced in the STOA project. For the facts, Wikipedia has been used to add information where it was not covered by the report. The articles are from a special transport issue of a magazine published by The Danish Board of Technology called Technology Debate.

Introduction

During the past decades the European transport sector has been characterised by impressive increase in overall transport volume and by exceedingly growth rates in road and air transport. The European enlargement, expansions of the economy in modern societies and improvements of general standards of living are driving forces for the growth in both freight and passenger transport.

An efficient transport system plays a key role for economic growth and social wealth in modern societies. But the increases of congestions and bottlenecks in the European transport network restrict the free flow of goods and people, especially in the centrally located and densely populated regions of the European Union. At the same time, the increased amount of traffic has led to a strong reduction of the quality of life because of the major environmental consequences.

The climate change and the human activity induced CO2 emissions have set focus on the contributions to this development from the transport sector and the growing transport volume. To this can be added the fact that nearly the entire transport sector depends on oil. Oil that is a finite resource, vulnerable to political instabilities and dramatic changes in price, and a source for greenhouse gas emissions.

The EU has stated that to keep the impacts of climate change at a manageable level, meaning that we will be able to adapt to them, the global temperature should not exceed the pre-industrial level by more than 2 C. To achieve this target, developed countries and regions, including EU, should reduce their emissions by 60-80% over the period 1990 – 2050. EU's environmental ministers agreed in 2007 to reduce GHG emissions by 20% in 2020 – and if a global agreement would be made at the Copenhagen Summit in 2009, EU would oblige itself to reduce emissions by 30%. The European Commission confirmed this in January 2008.

In line with the general European targets for reducing CO2 emissions from the use of fossil energy, the transport sector using big shares of fossil fuels should live up to similar targets. For the STOA project targets were set in line with this:

- The consumption of oil should be reduced by 80%.
- CO2 emissions should be reduced by 60%.
- Accessibility: to offer an efficient, effective transportation system at affordable prices

These targets should be achieved within **long distance transport,** meaning transport **exceeding 150 km**. Long distance transport includes both passenger and freight transport on road, rail, via air, rivers and sea.

To meet these targets and yet provide mobility in terms of transport is a huge challenge. What are the options?

Basically, there are three possible ways to reduce oil consumption and CO2 emission from long distance transport.

- Decrease transport volumes, e.g. by spatial planning in order to prevent transport growth without jeopardizing citizens mobility, or by substituting transport with virtual mobility
- Shift to sustainable transport modes.
- Transport efficiency, improve transport technologies and transport flows, Improving energy efficiency and carbon intensity.

These different options have been investigated in two slightly different scenarios:

- Strong and rich High-Tech Europe, with focus on technologies
- Slow and reflexive lifestyles, with focus on changing transport behaviour

The story of John and Maria reflects the differences of the two scenarios.

Article 1: Transport in Europe – it must be changed!

The growing traffic in Europe will be out of the question in the long run. Global warming, energy supply, security and waste of resources limit the future possibilities. The demands of the future transport system involve far more effective means of transport, independency of oil, prevention of waste of resources, limitation of unnecessary traffic and development of flexible and environmental-friendly transport systems of high capacity.

BY JOURNALIST EBBE SØNDERRIIS

Shopping in Vienna or Rome, holidays at the Mediterranean, studying in Czechoslovakia or Spain, working far away from home – all this is part of living in modern Europe. As well as being able to buy fresh strawberries and chantarelles flown in, Italian design and French wine – the European common market means distribution of local goods to all European citizens. And of exotic goods from remote countries, distributed from the big harbours of Antwerp, Genoa etc. We import flowers from Kenya, Colombia, India– and each bunch of flowers travels 54,000 km by air before being sold at our local florist (counted as the added number of kilometres of each individual flower).

Carbon footprint

Roses from Kenya are six times better for the climate than roses from Holland. This is the result of a survey by researchers at the Bedford University. In Holland, roses are grown in greenhouses by artificial light. In Kenya, the climate is warm and the sun is shining, also in the month of February. Kenyan rose gardening has 70 percent better output than Dutch - and part of the energy is geothermal.

The survey was ordered and paid for by the company World Flowers and the supermarket chain Sainsbury's. Nevertheless, the point is not revolutionary. It has been known for a long time that the worst scenario is to grow fruit and vegetables as well as flowers in a greenhouse in the middle of winter. Transport by flight is number two. Truck and vessel are number three. The best is to use the vegetables of the season and stay away from summer flowers in the wintertime. Sir Terry Leahy, head of the major supermarket chain Tesco, carrying 31.3 percent of the British retailing, has promised that all Tesco's goods will in future be labelled, informing the consumer how heavily the goods influence negatively on the global climate - called carbon footprint labelling.

And especially, the consumers want experiences. They will not settle with the growing number of offers from the media industry to have virtual experiences from the entire world. They want to go there themselves, and they prefer low fare air tickets. Tourism is growing explosively.

Just in time and internationalisation

The companies earn more and more by splitting up production and move goods and components around. Even simple things are made up by components from all over the world.

Online connections and technical standardisation make it possible to take advantage of both large and small differences in wages. This goes for the world as a whole as well as within the new borders of the EU. More and more things are produced at one specific location for the entire world. Containers keep arriving at Europe's major deep-water ports from which they are redistributed, mostly by truck.

Because of this development, logistics are becoming more and more important. It is expensive and ineffective to manufacture for storage. Both manpower and goods should be mobile. The products should arrive at their destination just in time and in the correct amount and quality. The companies and customers do not have time to wait for governmental commissions promising improved freight trains, if they can solve their transport problems right away with an extra truck and driver. Intermediate and end warehouses are stationed on rubber tyres.

Transport is increasing

For the last 15 years, freight transport has increased by 43 percent and passenger transport by 20 percent, says the European Environment Agency in its 2007 report on transport and environment. Air passenger travel alone has increased by 49 percent between 1995 and 2005, and freight transport by road has increased by 38 percent in the same period. In the new EU countries, road transport has increased from 40 to 60 percent and traffic by rail has decreased accordingly. In the air territory of the EU, traffic of passenger flights has doubled and airfreight increased even more. The airports of the EU now carry almost 800 million passengers and more than 11 million tons of freight a year. The prognosis of the EU Commission for the years 2000-2020 predicts 50 percent more freight transport (mostly by road, least by railway) and 35 percent more passenger transport, thereof a doubling of transport by air.

To continue this development without other technologies and changed behaviour is out of the question. The EU has realised that the global warming must be kept below two degrees in order to avoid the risk of catastrophic, self-increasing disturbance of the climate. It presupposes that the emissions of greenhouse gases are reduced by one third for the next twenty years, and by four fifths for the next forty years.

But in the area of transport in particular, words and action are far from each other. It does not help to make limitations of the emissions for all other sectors, if the emission from transport will still increase. Over the last 15 years, it has grown by 26 percent, whereas the emissions from energy supply, business and households have fallen.

The oil dilemma

Furthermore, the development is out of the question because of the insecure future energy supply. In theory, there is oil, gas and coal for still many years. In practise, the growing imbalance of an increasing demand and a stagnant production of cheap crude oil present a limitation that can already be felt.

About one third of the final energy consumption in the EU-25 (today's level) is related to transport. The transport market today is almost entirely dependant on oil-based fuels and is responsible for about 70 percent of the final oil demand in the EU-25 (both urban and long-distance transport). Emissions from the transport sector are significant and contribute increasingly to the EU's overall GHG emissions: in 2005, transport contributed to the total GHG emissions in the EU-27 with a share of 24.1 percent (one fourth).

If the world consumption of crude oil will increase by just 1.5 percent a year, it will take 100 million barrels of oil a day in ten years. Many oil experts consider this unrealistic, even if they include unconventional sources such as Canadian oil sands and discover new oilfields, for instance in Greenland and the deep sea.

The price of oil will increase dramatically when production can no longer meet the growing demand. This will affect all other pricing. Furthermore, the world will see millions of environmental refugees because of global warming as well as an increasing tension between wealthy and poor people.

Security policy is another reason to find new ways of sustainable development, also within the transport sector.

New energy to the EU transport politics

The present means of transport use only a small part of the energy for the actual purpose - mobility. And they drive around with empty cargo space and seats. Part of the time they stand still, not only in the densely populated urban areas, but also on the trans-European highways and motorways.

The EU transport politics do also aim at increasing the efficiency of the means of transport, decreasing pollution, developing alternative fuels and moving cargo from truck to rail or vessel. The collective traffic and the express rail connection should be strengthened. The capacity of the trans-European net of rails, roads and waterways should be improved.

The railroads have experienced a certain success of passenger transport in express trains on time. But by far enough to equal the growing car traffic and the low fare air tickets. It looks worse when it comes to cargo. The load of a freight wagon moves through Europe with an average speed of 20 kilometres an hour. And it does not arrive on time.

An effective and modernised rail service could solve many of the European transport problems. In theory, time, energy and money could be saved. But the EU's attempt to move cargo from road to rail has been a disaster. Now, they have lowered their ambitions and instead emphasise an improved combination of the means of transport.

Article II: More asphalt in Eastern Europe

The economic growth in the new member countries of the EU is far higher than in the former countries. The Eastern Europeans want jobs and wages, cars and roads, consumption and holidays like in the Western countries. They repeat the same mistakes on their way.

BY JOURNALIST EBBE SØNDERRIIS

- 'We recognise Poland's need for an improved infrastructure, but the development must conform to the EU legislation', says Marta Wisniewska from The World Wide Fund for Nature in Poland about the motorway that the Polish government wants to construct through a protected nature resort in the Rospuda valley. The road will cross a wet area rich in bird and plant life. It is protected under the Natura 2000 regulations.

The organisation CEE Bankwatch Network has similar examples from Czechoslovakia and Bulgaria. 'The countries in Central and Eastern Europe follow the Western model, without restraint, of being car dependant. The breakneck speed of the development is alarming. The EU funds and banks such as the European Investment Bank and the European Bank for Reconstruction and Development help supporting the controversial change of the transport sector of the area. From 1998 to 2003, they gave ten billion Euro as subsidies and loans, primarily for transport infrastructure that is not sustainable', writes the CEE Bankwatch on their website. The European Investment Bank themselves inform that 65 percent of the money goes to the construction of roads, and only 27 percent for railways.

The road is undermined

In the case of the Polish motorway the EU Commission is determined. And the Court of Justice of the European Communities sustained the decision. In April 2007, the court decided that the road construction in the protected nature area should discontinue until further notice. Since then, a new Polish government has stopped the project and summoned all parties involved, also environmental organisation, to a meeting about an alternative route.

The contested road section is part of the Via Baltica from Tallinn to Warsaw, the connecting road of Finland, Estonia, Latvia and Lithuania to the EU inner market. And it needs severe improvement, concludes the Finnish journalist Esko Nurmi to the newspaper The Helsingin Sanomat. Certain sections in the Baltic countries are quite as good as a motorway, whereas other sections have big holes in the road. The very foundation of the road has broken down from the weight of heavy traffic. The number of trucks has tripled in ten years, he writes. In Poland, the road quality is even worse than in the Baltic countries.

More traffic in the future

The big need for improved roads is closely linked to the economic growth and the economic inequality of Eastern and Western Europe.

The wages in the new member countries of the EU are typically less than half the wages in Western Europe. In Poland, it is 47 percent below average. In Rumania and Bulgaria 62-63 percent below average, the latest figures from Eurostat show. Therefore, it is highly beneficial to move production to the new member countries. At the same time (and partly for the same reason), their economic growth is far higher than in Western Europe. The growing affluence is converted into cars, construction, consumer goods and travels.

But even if the growth in the East will in future stay two-three times bigger than the growth in the West, it will take 15 to 30 years until the eastern EU countries will reach the western purchasing power. Until then, the road traffic (and air traffic) will grow. More Eastern Europeans will have time to drive a car. They will buy more goods transported from Western Europe.

But at the same time, it will still be economical to move production to the east. And transport the goods back to the west, where the major purchasing power will still be present for a long time.

Scenarios: Meet John and Maria

Europe some 5-10 years ahead of now

John loves life in the fast lane and believes that technology will be the solution to climate change

John is 33. He lives in the south of Spain. He is a logistics manager at a large transport company distributing vegetables to all of Europe.

Being married and having 2 small children, he sometimes misses the free life as a bachelor. He loves life 'in the fast lane', always being on-line, travelling a lot and driving fast cars. Stress is not an issue – he likes to be very active and to change environment often.

He likes to go on weekends alone and with his family, to visit far-away holiday resorts, buy exotic foods, clothes and cheap electronic equipment from all over the world.

New fuel and propulsion technologies will help us

John knows that climate change also originates from human activity including transport. But he is very optimistic about technological solutions. He expects that researchers and engineers in a few years will provide us with clean technologies for transport. Perhaps something new like **hydrogen powered fuel cells** or **purely electric vehicles (1)**. From his point of view, electricity can be supplied from nuclear power plants or windmills, as long as it has the required impact on the CO2 emission.

He and his business colleagues often discuss the issue of fuels for transport in the light of the rising oil prices that put hard pressure on the freight sector. He always speaks in favour of using all possible energy sources and CO2 lean propulsion technologies. “If necessary, and I think it is, Europe must buy energy from other parts of the world. Also **bio fuels (1)**. This was what we did with oil, to make our economic growth possible. And why not import electricity from northern Africa, where the sun always shines”?

John thinks that the market will solve the problems. If it becomes even more expensive to buy oil, well, then new technological solutions will be profitable to invest in. With CO2 lean technologies at hand, John sees no problem in expanding the European infrastructure: highways from east to west, south to north, airports, harbours and 'motorways of the sea' for big bulk freight transport. He knew from experience, that transport is a growing trade, but the positive development can only continue, if bottlenecks, for instance through the Pyrenees, are removed and the roads become accessible.

Of course, better use of existing capacity is also on his want list, and therefore he would go for more investments in **Intelligent Traffic Systems (2)** as well. When driving his own car, he likes very much to use Global Positioning system for route guidance, and of course for supply chain management in his job it is crucial. Combining RFID tagging of the vehicles and loads with GPS or GSM would really make a difference for tracking and tracing goods and improve reliable and just-in-time delivery.

There must be a limit to pricing and taxing transport

John is not really in favour of more taxes, but he can accept the idea of **road pricing (3)**, if it is used for optimising transport flows and reducing congestion. It worked in London and other European cities and it is now the plan to implement road pricing on certain motorways in Europe, based on the German MAUT model. He hopes this will provide more room for trucks that cross Europe. It will of course make long-distance transport by truck more expensive. But transport prices are on their way up anyway due to increasing oil prices. And the consumers should pay for this.

John could also accept to have a general **carbon tax (4)** for the entire transport sector – this seemed to be a fair solution as a polluter-pays-principle. But to put extra carbon tax on air transport within Europe at the expense of passengers who need to travel a lot across Europe for business purposes, or even for leisure, he could not accept. The real effect was an increase in costs of the services delivered to customers, and this would limit the development of the intra-European market and cooperation.

Fast transport for shopping tours - virtual meetings for business?

He was aware that his personal preference for flying was perhaps at stake here. Having a busy working life, he really would prefer fast transport. He also liked to take his wife and children on weekend trips to European cities. Not only for shopping, but also to experience a different atmosphere. He likes the idea of eating the best Italian food in the outskirts of Florins, to buy the best red wines from Bourgogne after a personal visit to the local vineyard. And he liked to make his children think like Europeans by getting familiar with the different cultures of Europe.

He was also for aviation inclined to believe in salvation through technology. He had read about the so-called **flying wing (5/12)** for energy efficient and fast CO2 lean air transport – this sounded promising.

For business purposes, **virtual meetings (6)** could be a way to reduce air transport. John's company has made an internal agreement with all business relations to keep physical meetings at a minimum. The objective is that 80 percent of all meetings in 2020 should take place virtually. To meet that objective, improvements in ICTs would be necessary, John thought. Today, it was not that easy to share ideas on virtual whiteboards together with a bunch of colleagues sitting in offices far away - or to check the look on the face of someone not saying anything.

And John would miss the beer-sessions of old-time physical meetings. Being relaxed and sharing jokes was not just fun; it also established a trust needed for achieving a fruitful cooperation.

High-speed rail is an option

John does see the point of climate change. Of course he does. He would like to see his children grow up in a safe world, which would also mean a world not dominated by serious climate change and consequences of lack of food, increasing poverty and health problems, wars on fresh water supplies etc. When travelling distances of 5-600 km, **high-speed rail (7)** in some parts of Europe could be a better option than air transport. 'I will take the train when the rail network starts living up to the standards that were promised years ago', he usually argued, when his wife appealed to his bad conscience.

John is not sure that further investments in rail infrastructure were really the answer to the growing transport demand. To his knowledge, there was still a hidden potential in using the existing capacity more efficiently. One should really consider the costs before just building more railways. How about improving the rail management systems? There were still huge differences between the European countries, creating unnecessary waiting time. John believed that the rail system should be privatised. Only in this way will the rail operators be forced to become more efficient and to improve the rail infrastructure.

Maria prefers a relaxed life and is worried about climate change

Maria is 46 and lives in North-eastern Germany with her teenage son. She works as a consultant for the government's healthcare programme. Lately, she has taken up a more relaxed lifestyle with a good working life balance, meditating each morning and mainly enjoying vegetarian food.

It is about behaviour, not technology

Both through her work and among her friends she has met many people with stress who, she believes, have burned out due to stress at work and a too active life as such. Some years ago, she chose to reduce her working hours and consequently also her income. Because of that, she also chose not to have her own car and joined a **car sharing service (8)**. She is no fan of luxury goods and prefers locally produced food and quality goods. To her, buying new things all the time is not the road to happiness. She tends to keep things until they are really worn out.

Maria is worried about the climate change. She thinks that it is about time Europeans take responsibility for their CO2 producing travelling and consumer habits in general. She is sceptical about technological solutions. No technology has so far been capable of solving the CO2 negative impact that transport has. She fears that the demand for CO2 lean technological solutions such as electrification of the railways will increase the demand for CO2 lean electricity to an extent that paves the way for building more nuclear power plants in Europe.

Europe should go for sustainable energy

She obviously finds it wise to strive for electrically driven cars and trains. She is reluctant to fill her shared car with **bio fuel (1)** when she wants to take the long drive to visit her parents. Even if the **labelling of bio fuels (9)** was added, and she could at least check how the bio fuels had been produced, she would often feel uncomfortable. Could one be sure that land used for bio fuel crops has not been used for producing food before? Can those Brazilian heads of government really be trusted in this matter? She thinks that Europe should be pioneers and strive to have the total energy consumption covered by all kinds of sustainable energy.

Air carbon allowance could give priority to rail transport

She supports regulation, preferably for the entire Europe, forcing people to change their consumption of transport in a CO2 lean direction. She finds it reasonable to pay a particularly high **air carbon tax (4)** when you know how much air transport damages the environment. Air transport had really become a major problem after the enormous growth caused by low fare tickets. Before, she and her son often went by air. Maria had spent some years working and studying in Italy and here she met the father of her child.

They were together for some years, but then decided to split up. When Maria went back to Germany with her son it involved visits to the father several times each year – and flying was simply the cheapest and fastest way of travelling.

Nowadays, her son travels alone, but still prefers to travel by air, though Maria has tried to convince him to take the train.

Instead of higher prices, she personally better liked the idea of **individual carbon allowances (10).** This, she thought, would make it easier to convince her son to take the train and save some of his carbon credits for the big tour around the world he was planning to do, when finishing school in some years. Frankly, it would also save her some money.

Road pricing and social inequality

Recently, she discussed the price of protecting the environment with one of her friends who is a single mother just like Maria. This friend lives in the countryside, in the same village as her parents. She wants her children to grow up in close contact with nature and the animals. And her parents could look after the children sometimes, so she could go out on her own.

With the new suggestion of **road pricing (3)** in most of the road network, Maria's friend feels that she is financially punished for her choice of living in the countryside. There is no railway station and no public transport that can bring her to the city in a cheap way, without having a lot of waiting time. She is dependant on her car. Of course the rising oil prices had made car driving more expensive. This made her invest in a hybrid model. Road pricing would really be a problem for her. 'It isn’t fair', she said.

Maria shared her critique to some extent. 'I find that the cars that use most fuel and produce the largest CO2 emission should pay most. People like you, who live in the countryside, should of course be compensated, if there is no alternative transport'. Maria, on the other hand, found it acceptable that prices of goods that were transported thousands of kilometres on the roads were more expensive as a consequence of road pricing. 'It makes sense to adjust the prices in this way according to the carbon footprint of the goods', she said.

The slow speed train to pleasure and comfort

Maria's own favourite mode of transport was the train, and not just the expensive **high-speed rail (7)** like the one from London to Paris. She enjoys the cheap and **slow trains (7/11)** because they are very comfortable. On holiday trips, she did not mind spending some days on a train in a very nice compartment, having a massage and watching and listening to operas in the best sound and 3-D quality. She could also lean back into the soft armchair and watch the shifting landscapes passing by through the panorama window and read small leaflets on the various locations on the screen next to the window. Though she lived in a big city, she enjoyed nature sceneries very much. She really hoped that much of Europe’s wild nature would be protected. And not only the wild nature; she also liked to see the small villages and farms, and rivers that were not changed into some sort of water motorways. The eagerness lately of having the **infrastructure (12)** extended and developing new industrial areas had left too much scandalous damage to nature, in Maria's opinion.

To her, it seemed to be really urgent to allocate more **investments in the railway infrastructure (12)**, and to make international agreements to make sure this would happen. This should be given higher priority than to build roads and tunnels to remove all the bottlenecks in Europe. Would it not just give more traffic, if the accessibility to motorways and highways were improved?

Facts about technologies and policy measures

The highlighted words in the stories about John and Maria are explained, discussed and illustrated in the following text. Numbers refer to the numbers in the text, to clarify where this information is relevant.

1) Fuels and propulsion technologies to reduce CO2 from transport

A wide range of non oil-based options for transport has been developed for the last decade, and some are already in use. The following technological mainstreams for road transport (cars, trucks, busses) are discussed today:

Hydrogen and fuel cells. It sounds like a very good idea, simply to put hydrogen in the car and make fuel cells turn the hydrogen into electricity and only water as output. However, it takes energy to produce the hydrogen for the car. Hydrogen-powered vehicles are only as clean as the energy that is used to produce electricity or hydrogen. So, the crucial question is where the ”clean” hydrogen or “clean” electricity is taken from – will it be from renewable sources, from fossil sources like coal and natural gas, from nuclear power?

Experts estimate that it will take 15-20 years from now, until we see the hydrogen car take over.

Hybrid technology. A hybrid car is run by means of a combination of a fuel motor (petrol or diesel) and an electricity motor. Through stop-and-go driving energy is loaded into the battery. Hybrid cars are already on the market. The hybrid technology is also under development for trucks.

Plug-in hybrids are discussed as an interesting alternative for long-distance car transport.

Battery electric vehicles. The purely electrically driven vehicle depends on the development of suitable devices for the storage of electric energy (batteries or condensators) and would therefore mainly be related to car transport. Considerable improvements in battery technology (range and loading times) are needed to enable a significant commercialisation of battery electric vehicles. Now they are mainly for urban transport. And as for hydrogen and fuel cells, the question is where the “clean” electricity comes from.

The next two technologies should mainly be considered as bridges till new solutions such as hydrogen and fuel cells will penetrate the markets sometimes in the future.

Bio fuels. First generation fuels made by corn and grain, soy and oilseed rape such as bio-diesel and bio-ethanol used to blend with diesel or petrol, are already commercially deployed. Second generation bio fuels based on straw and other bio waste are still under development.

To use bio fuels for transport in Europe we need to import biomass, which might go at the expense of ecologically sensitive areas and might be in competition with the production of food. The EU commission is currently discussing, if the target of 10 percent bio fuels of all road vehicle fuel by 2020 should be changed, when considering the present food crisis. The restricted potential of domestic biomass might be used mainly for long-distance trucking, while urban transport should use other fuels and propulsion technologies.

Natural gas and LPG (auto gas). Gaseous fuels based on fossil feedstock offer environmental benefits at a relatively low cost. The technology is popular in many European countries, and is already used for trucks.

Fuel and propulsion technologies for rail

For rail transport, both passenger and freight, electrification seems to be the simplest way ahead to CO2-free transport. As for hydrogen, the question is how the electric power is generated. Higher load capacities, longer trains and double-deckers are measures to optimise capacity use.

Fuel and propulsion technologies for aviation

For air transport research on alternative fuels and propulsion technologies is at a very early stage. There is currently no promising fuel alternative for kerosene. Hydrogen is discussed, but for many reasons, and most importantly security reasons since hydrogen is an explosive, it has a very long-term perspective. Bio-kerosene is discussed as well. But again, tough security standards hamper commercialisation. Furthermore, it seems to be easier to use the limited amount of biomass for road transport or power generation.

Fuel and propulsion technologies for shipping

For ships, hydrogen and fuel cells might be relevant and first prototypes are being tested. Recently, the so-called Skysails systems offer promising potentials to reduce energy and emissions. The system is a wind propulsion system based on large towing kites. It is said that by using the Skysails-System, a ship‘s fuel costs can be reduced by 10- 35% on annual average, depending on wind conditions. Market penetration of this system is just about to start.

2) Intelligent Transport Systems – ITS

Intelligent Transport Systems focus on better organisation of transport through information and communication such as real time information for public transport passengers; on the steering of traffic flows for example by dynamic speed control on highways and route guidance; on optimising logistics chains in freight transport. It is strongly related to optimised use of infrastructure in terms of capacity, and it enables new options for financing infrastructure via road pricing. The Global Positioning System can be an integrated part of ITS both for route guidance and road pricing purposes.

Towards reducing the CO2 emissions from transport, ITS has the potential to reduce fuel consumption by making traffic run more smooth and reduce stop-and-go driving. ITS can also be used for intelligent air management, e.g. for issuing landing slots and avoid that airplanes are circulating for a long time before landing.

Visions are that some day cars and trucks will join to form road trains of automatically controlled vehicles that travel closely together. In such automated highways one could imagine a centrally controlled speed system.

3) Road pricing

Road pricing is an economical concept regarding the various direct charges applied for the use of roads. The road charges include tolls and congestion charges, which may vary by time of day, by the specific road, or by the specific vehicle type, being used. Road pricing has two distinct objectives: revenue generation, usually for road infrastructure financing, and congestion pricing for demand management purposes.

Congestion Road pricing in urban areas has been introduced in European cities such as London and Stockholm. The LKW-MAUT was introduced in Germany on 1st January 2005, followed by Austria and Switzerland. **MAUT** is a toll for freight vehicles based on the distance in kilometres, the number of axles and the emission category of the vehicle. The toll is restricted to highways and some specific roads. In Germany, it has been discussed to also include passenger cars.

Global Positioning Systems (GPS or Galileo) enable the MAUT sort of road pricing system. The pricing can be differentiated in a way that the highest prices are in the peak hours and on certain sections of high congestion risk. It could be free of charge to travel by night and thus spread out the use of the roads over 24 hours.

Benefits and disadvantages: Road pricing could mean better accessibility**,** because of less congestion; increasing average travel speed without increasing absolute speed. Road pricing will have an impact on transport volume by reducing the number of travels and reduce long-distance weekend trips. This will save energy and reduce CO2-emissions.

Road pricing like the MAUT system for freight transport by road will increase prices for trucking and thus make the railways more competitive.

If road pricing only includes some roads, there is a risk of trucks and cars taking detours to avoid the charges.

Road pricing has potentially negative consequences in terms of social and geographical inequalities. People with low income commuting to jobs in the cities will need to find alternatives, meaning that public transport should be cheaper. People living in rural areas with no alternatives to car transport should be offered compensation. Otherwise, the rural population will decline faster.

For the consumer, road pricing on freight transport means higher prices for goods that have been transported over long distances by truck.

4) Carbon tax and emission trading

Carbon tax is a taxation based on how large emissions of CO2 and other greenhouse gases are. It can be used for transport, for power stations using coal etc. Taxing something that is undesirable is a method to confront users with the external cost of carbon and hence reduce emissions to efficient levels.

Carbon tax could have an immediate impact on CO2 emissions, but only if the price is high enough.

Benefits and disadvantages are somewhat similar to road pricing.

Emission trading and **carbon allowances** are administrative approaches used to control pollution by providing economic incentives for achieving reductions of the emissions of pollutants. It is sometimes called **cap and trade**. A central authority sets a limit or *cap* on the amount of a pollutant that can be emitted. Companies receive an emission permit and are required to hold an equivalent number of *allowances* (or *credits*), which represent the right to emit a specific amount. The total amount of allowances and credits cannot exceed the cap, thereby limiting the total emission to a certain level. Companies that need to increase their emissions must buy credits from those who pollute less.

Air carbon tax and ETS

The European Parliament and the Commission are currently negotiating the Green Paper on market-based instruments for environment and related policy purposes. One suggestion is to include air transport should be included in the EU's Emissions Trading Scheme (ETS). This is strongly supported by the European Parliaments Environment committee, who voted for a proposal to include airline traffic in the (ETS) by 2011. It was discussed if this would be in conflict with having a specific air carbon tax – which some MEP's thought, and others disagreed. So far, aviation has not been exposed to energy taxation but it is brought up as a proposal in the Green Paper.

5) The flying wing

The so-called '**flying wing**' has long been a designer's dream of an energy efficient form of air travel. It owes its efficiency to the fact that it has no fuselage and therefore a smaller area exposed to drag from the wind. There are expectations of reducing CO2 emissions by 30-40 percent (by increasing the energy efficiency per passenger kilometre), but the demands for investments in research and demonstration are high. Long lifetimes for airplanes, up to 40 years, means that designs like the flying wing will have an even longer time perspective.

6) Virtual mobility

It is often discussed whether improved communication facilities for virtual mobility in the future will substitute transport to some extent. Typical examples are videoconferences, teleworking, online shopping. So far, experience has shown that this will not be the case. Telephone calls, letters and e-mails are not known to have reduced transport; and having more international contacts to keep in touch with via new information technologies seems to induce more transport. But when transport gets more expensive, virtual mobility could be an alternative.

A breakthrough for virtual mobility could be *telepresencing*, combining videoconference and virtual reality to create a three-dimensional, high-speed, free-flow interaction across different geographical locations.

7) High-speed rail

Generally high-speed is defined as greater than 200 km/h- applying to both the train's maximum speed and the track's dimensions. Most modern high-speed trains do not exceed 350 km/h and trains exceeding this speed encounter several physical and electrical challenges; in the future this may lead to a separate designation for these even higher-speed trains. The key technologies are already available, but investments in infrastructure and a higher degree in international standardisation are missing.

High-speed rail is best suited for journeys of 2 - 3 hours (150-600 km or about 100-400 miles), for which the train can beat both air and car in this range. The speed is much higher than possible for a car. And for air, the process of checking in and going through security screening at airports, as well as the journey to the airport itself makes the total air journey time no faster than HSR.

High-speed trains are more energy efficient than aircraft on a same load factor basis, as trains consume less energy per passenger-kilometre. Compared to slow-speed trains, the energy efficiency is not as good – and neither the CO2 emissions.

It is now possible to travel from London to Paris in 2 hours 15 minutes. Spain and France are currently working on a high-speed rail corridor at the Pyrenees and connecting existing French and Spanish high-speed rail. Germany, Italy, Belgium, Sweden all have high-speed rail. The EU TEN-T programme plans for more high-speed rail corridors in the Southwest and East of Europe.

While high-speed rail is designed for passenger travel, some high-speed systems offer also some kind of freight service. For instance, the French mail service *La Poste* owns a few special TGV trains for carrying postal freight.

8) Car sharing

Car sharing is a relatively new concept starting to spread. On a voluntary basis, citizens in several European cities have established networks for standardised car sharing services. In Germany, nearly all cities with more than 100,000 inhabitants have established car sharing. Since 1998, people in Switzerland have been able to ride trains at half price with the Mobility Rail Card, which, at the same time, gives access to car sharing countrywide. In Berlin, since 2000, the Metrocard combines public transport and car sharing.

9) Labels for carbon footprint and bio fuels

Carbon footprint label

The Carbon trust issues Carbon Reduction Label and describes the purpose as follows: The label shows you the amount of CO_2 and other greenhouse gases emitted as part of a product's manufacture, distribution, use and disposal otherwise known as its carbon footprint. Those companies who label their products and services are committed to reducing their carbon footprints from the figure shown within two years. As more companies sign up to Carbon Reduction Labelling, you'll be able to make a more informed choice.

Bio fuel social label

There exist a label, which is a quality warning for consumers, but there is no label explaining if the bio fuel was produced in a socially and ethically responsible way. However, such a label could be a way to increase awareness of the conflict of using crops for food or fuels.

10) Individual carbon allowances

Individual carbon allowance is not an implemented policy measure, as the cap and trade system is.

The basic principle could be that each citizen has the right to produce a certain amount of CO2. Car, coach, airplane etc. can be carbon-credited differently, depending on how much CO2 they emit per passenger km. The result could be that trains would be more attractive than airplanes, if a person wants to travel a lot; or that she would make fewer trips, but for a longer period at a time. The allowance can be used by the owner, or sold to others. This system would benefit the poorest part of the population who do not have the means to travel a lot and who would consequently not use their carbon allowances. There should be a cap for individual allowances as well.

11) Slower speed for road and air transport

Slower speed is a “low-tech” and cheap measure that can be quite efficient for reducing CO2 emissions. For **cars** driving on motorways and trunk roads, there is a potential for 15-20% reduction in carbon emissions if a maximum speed limit of 80 km/hr is introduced. Similar speed limits could be introduced for **trucks**. It should be combined with better driving techniques – ecological driving – to reduce the fuel use.

In **aviation**, to fly 700 km/hour instead of 900 km/hour could reduce CO2 emissions by 25 %. The best airplane for this would be a Turbo-propeller aircraft. Some companies already use reducing speed in conventional airplanes, but the CO2 effect is lower than for a turbo-propeller.

12) Infrastructure and research - EU investments

Trans-European transport networks

The Trans-European transport network is a European Union strategy closely linked to the creation of the inner market with free movement of goods, people and services within its borders. It is also seen as an important element for economic growth and the creation of employment.

A central element of the strategy is to remove bottlenecks and enlarge capacities; TEN-T is a list of 30 prioritised projects to be started before 2010. It includes upgrading and building new airports, new high-speed railway lines, motorways of the sea and many other projects. Examples are the upgrading of the Rhine-Main-Danube canal. This canal connects the river Danube with the North Sea. Other examples are:

- The motorway corridor Igoumenitsa/Patra-Athina-Sofia-Budapest

- The railway corridor Lyon-Trieste-Divaca/Koper-Divaca-Ljubljana-Budapest-the Ukrainian border

- The Fehmarn Belt railway corridor between Denmark and Germany

FP 7 funding for transport research:

FP7 is the short version of the seventh framework programme for research and technological development. It is the EUs main instrument of financing research in Europe and runs from 2007 to 2013. Under the FP7, at least 4.1 billion EUR are granted to finance EU research with the aim of developing safer, 'greener' and 'smarter' European transport systems at the benefit of all citizens.

Planned activities in FP7 include:

• Aviation and air transport (to reduce emissions, development work within motors and alternative fuel, management of air traffic, security aspects of air transport, environmentally efficient aviation)

• Sustainable surface transport - rail, road and water (development of clean and efficient motors and electrical railways, i.e. reduction of the impact of transport on climate change, intermodal regional and national transport, clean and safe vehicles, buildings and maintenance of infrastructure, integrated architecture)

• Grants to the European global satellite navigation system - Galileo and EGNOS (navigation and timing services, efficient use of satellite navigation)

In addition, 2.3 billion EUR are granted for research in energy, among others including hydrogen and fuel cells.

Annex 3 – Questionnaire and interview guide

Questionnaire on long-distance transport

Welcome to the STOA project questionnaire opinion survey on long-distance transport and impacts on climate change.

In this questionnaire, you will be presented to a series of questions. *Please circle the number next to the answer you want to give.* You must give only *one* answer to each question, except when you are specifically asked to 'circle more than one answer to this question'. If you circle a wrong answer, just cross it out, and circle the correct one. You are more than welcome to ask questions along the way if you have any doubts about the meaning of the questions. To support the understanding of the questions, there is an alphabetic list of words and concepts used in the questionnaire (marked with *). You can check this list for help as well.

This questionnaire is a copy of the one, which was used in the Greek interview meeting. There are small differences between this questionnaire and the copy used in the Danish interview. The small variations are due to the experiences made at the Danish and Hungarian interview meetings and the differences in the structure of the educational system in the three countries.

Background questions:

1. Sex

1. Male
2. Female

2. Age *(open)*

- Age: ____

3. Number of persons in your household, yourself included?

1. 1 person
2. 2 persons
3. 3 persons
4. 4 persons or more

4. Do you have children?

1. Yes
2. No

5. Are there any children living at home?

1. Yes
2. No

6. What is your highest level of education?

1. Elementary school - 6 years of schooling
2. Gymnasium- 7or 9 years of schooling
3. Vocational training (skilled level/craftsman's training)
4. Secondary school (high school graduation)

5. Higher education not University
6. University Degree
7. Postgraduate

7. Please state your occupation

1. Manager
2. Worker (unskilled)
3. Worker (skilled)
4. Salaried worker/public servant
5. Self-employed
6. Apprentice, trainee, student
7. Old-age pensioner, early retirement pensioner
8. Housewife, assisting spouse
9. Currently on leave of absence
10. Currently unemployed
11. I am not sure
12. I prefer not to answer this question

Travelling habits

8. How often do you travel long distance (more than 150 km)?

1. At least once a week
2. At least once a month
3. At least once every six month
4. At least once a year
5. Less than once a year
6. I never travel long distance

9. How often do you travel by airplane (one return trip counts as one time)?

1. More than 5 times a year
2. 3-5 times a year
3. 1-2 times a year
4. Less than 1 time a year
5. I never go by airplane

10. How often do you travel more than 150 km by train?

1. At least once a week
2. At least once a month
3. At least once every six month
4. At least once a year
5. Less than once a year

6. I never travel more than 150 km by train

11. How often do you travel more than 150 km by car?

1. At least once a week
2. At least once a month
3. At least once every six month
4. At least once a year
5. Less than once a year
6. I never travel more than 150 km by car

12. What is <u>most often</u> your purpose when you travel more than 150 km?

1. Visit friends or family
2. Work related
3. Vacation
4. A mix of the three above
5. Other purpose – write in your own words_____
6. I never travel more than 150 km

Consumer habits

13. Which elements influence on your choice of goods when you buy foods? (E.g. fruits and vegetables, dairy products)?

On a scale from 1 to 5: Please circle '1', if it has high influence on your choice. Please circle '5', if it does not have any influence on your choice.

A. Price of the food article

1. Very high influence
2. High influence
3. Some influence
4. Little influence
5. No influence at all

B. Quality of the food article

1. Very high influence
2. High influence
3. Some influence
4. Little influence
5. No influence at all

C. If the food article is manufactured under environmentally safe conditions

1. Very high influence
2. High influence

3. Some influence
4. Little influence
5. No influence at all

D. The country of production

1. Very high influence
2. High influence
3. Some influence
4. Little influence
5. No influence at all

14. Which elements influence on your choice of goods when you buy other goods (non-food like clothes, electronic equipment)? On a scale from 1 to 5: Please circle '1', if it has high influence on your choice. Please circle '5', if it does not have any influence on your choice.

A. Price of the non-food article

1. Very high influence
2. High influence
3. Some influence
4. Little influence
5. No influence at all

B. Quality of the non-food article

1. Very high influence
2. High influence
3. Some influence
4. Little influence
5. No influence at all

C. If the non-food article is manufactured under environmentally safe conditions

1. Very high influence
2. High influence
3. Some influence
4. Little influence
5. No influence at all

D. The country of production

6. Very high influence
7. High influence
8. Some influence
9. Little influence
10. No influence at all

15. Do you consider how far a food article has travelled, when you buy it?

1. Yes, and it influences on my choice of goods
2. Yes, but it does not influence on my choice of goods
3. No, I do not think about it
4. I don't know

16. Do you consider how far a non-food article has travelled, when you buy it?

5. Yes, and it influences on my choice of goods
6. Yes, but it does not influence on my choice of goods
7. No, I do not think about it
8. I don't know

17. Do you consider the way an article has been transported, when you buy it (by air, train, truck, vessel)?

1. Yes, and it influences on my choice of goods
2. Yes, but it does not influence on my choice of goods
3. No, I do not think about it
4. I don't know

18. Do you consider if an article has been manufactured with the least possible CO2 emission?

5. Yes, and it influences on my choice of goods
6. Yes, but it does not influence on my choice of goods
7. No, I do not think about it
8. I don't know

General questions / importance of transport

The European expansion, growth of the economy and improvements of general standards of living are the main incentives of the impressive growth in both freight and passenger transport that Europe has experienced over the last decades. An efficient transport system providing mobility of goods and passengers plays a key role for economic growth and welfare in modern societies. At the same time, the CO2 emission from the transport sector grows, the roads are crowded and the protection of nature will often suffer in favour of the construction of new roads. Therefore, transport also presents serious threats to life quality and welfare of the citizens.

In the next series of questions you will be asked to evaluate on the importance of mobility, economic growth, global warming and protection of nature. On a scale from 1 to 5: please circle '1', if it has very high importance. Please circle '5', if you do not find it to have any importance at all.

19. How important is mobility to the economy?

1. Very high importance
2. High importance
3. Some importance
4. Little importance
5. No importance at all

20. How important is it for you to be easily and efficiently transported across Europe?

1. Very high importance
2. High importance
3. Some importance
4. Little importance
5. No importance at all

21. How important is economic growth to the general economics?

1. Very high importance
2. High importance
3. Some importance
4. Little importance
5. No importance at all

22. How important is it for you to be able to buy goods from all of Europe?

1. Very high importance
2. High importance
3. Some importance
4. Little importance
5. No importance at all

23. How important is it for you to be able to buy goods from all over the world?

1. Very high importance
2. High importance
3. Some importance
4. Little importance
5. No importance at all

24. How important is it to protect nature resorts in Europe?

1. Very high importance
2. High importance

3. Some importance
4. Little importance
5. No importance at all

25. How important is it to limit global warming*?

1. Very high importance
2. High importance
3. Some importance
4. Little importance
5. No importance at all

26. Do you worry about the increasing emission of CO2* from the transport sector?

1. Yes
2. No
3. I don't know

27. Do you worry about the increasing dependency on oil* in the transport sector?

1. Yes
2. No
3. I don't know

General dilemmas - giving transport priority

The following questions concern which values/factors should be given priority to others. They are, like above, mobility, economic growth, protection of nature resorts and limit global warming. You are asked to choose what you would give priority to.

28. Which is most important; economic growth or to limit global warming*?

1. Economic growth is most important
2. To take action on climate change is most important
3. They are equally important
4. None of them are important
5. I don't know

29. Which is most important; mobility or to limit global warming*?

1. Mobility is most important
2. To take action on climate change is most important
3. They are equally important
4. None of them are important
5. I don't know

30. Which is most important; economic growth or protection of nature resorts?

1. Economic growth is most important
2. Protection of nature resorts is most important
3. They are equally important
4. None of them are important
5. I don't know

31. Which is most important; mobility or protection of nature resorts?

1. Mobility is most important
2. Protection of nature resorts is most important
3. They are equally important
4. None of them are important
5. I don't know

Possible solutions

32. What *three* means should be emphasised, if the aim is to limit the CO2 emission* from long-distance transport?

(Circle the three solutions you prefer)

1. General reduction* of passenger transport
2. General reduction* of freight transport
3. Further development of non-CO2 emitting fuel and technologies*
4. Use Intelligent Traffic Control*
5. Increased taxes and duties on CO2 emitting transport
6. Emphasise the use of less CO2 emitting means of transport
7. Speed reduction* for aircrafts and cars
8. Improved information on the CO2 emission of transport
9. I don't know

Price increases

Increased prices for long-distance transport of passengers and goods can lower the contribution of the transport sector to global warming. Higher prices for transport can make people reduce their number of trips, avoid the most CO2-producing modes of transport and shift to CO2-free modes – if possible. But price increases may also present a number of consequences for your consumption.

33. Which consequences are you willing to accept in order to limit the CO2 emission from transport over more than 150 km?

(You may circle more than one answer to this question)

1. I can accept fewer holiday trips by air or car to distant places (more than 150 km)
2. I can accept fewer business trips by air or car (more than 150 km)
3. I can accept smaller variety of goods from abroad in the supermarket
4. I can accept increased prices of daily necessities in general
5. I can accept increased prices of daily necessities with a large CO2 footprint*
6. I can accept increased prices of clothes
7. I am not willing to accept any of the above consequences

34. How much more are you willing to pay for long-distance travel (more than 150 km), if it can limit global warming?

1. Double price
2. 50% more
3. 25% more
4. 10% more
5. I am not willing to pay more to go far
6. I don't know

35. How much more expensive should travel by car be for you to choose the train?

1. Double price
2. 50% more
3. 25% more
4. 10% more
5. I always travel by train anyway
6. I will never choose train instead of car event though travelling by car becomes more expensive
7. I don't know

36. How much more expensive should travel by air be for you to choose the train?

1. Double price
2. 50% more
3. 25% more
4. 10% more
5. I always travel by train anyway
6. I will never choose train even though travelling by air becomes more expensive
7. I don't know

37. How much more are you willing to pay for foods from other countries, if it can limit global warming?

1. Double price
2. 50% more
3. 25% more
4. 10% more
5. I am not willing to pay more for goods that have been transported over a long distance
6. I don't know

38. How much more are you willing to pay for non-foods from other countries, if it can limit global warming?

7. Double price
8. 50% more
9. 25% more
10. 10% more
11. I am not willing to pay more for goods that have been transported over a long distance
12. I don't know

39. Which means of transport should be made more expensive in order to limit global warming?

(You may circle more than one answer to this question)

1. Going by air should be more expensive
2. Going by train more than 150 km should be more expensive
3. Going by car more than 150 km should be more expensive
4. No means of transport should be made more expensive in order to limit global warming
5. I don't know

Slow speed

Reducing speed* is a cheap and low-tech solution that can be quite efficient when reducing CO2 emissions. Slow speed may mean longer time to travel, for instance by air over very long distances and by car over fewer kilometres (see box with facts). Over shorter distances, slow speed may be compensated by improved logistics and short waiting time, for instance in airports or changing means of transport.

40. What is the most convincing argument to convince you to change means of transport with a lower CO2 emission?

(You may circle more than one answer to this question)

1. That it limits climate change
2. That it is less expensive
3. That it is more comfortable
4. That travelling hours are the same
5. I would never choose means of transport based on CO2 emission
6. I don't know

41. Which arguments would make you consider travelling less?

(You may circle more than one answer to this question)

1. It limits climate change
2. Travelling hours will be considerably more
3. It will be easier to have virtual meetings (videoconference etc.)
4. Other reasons_____
5. I don't know

42. Are you willing to accept reduced speed for air and car transport in order to limit the CO2 emission?

(You may circle more than one answer to this question)

1. I can accept that the average speed by air is reduced to 700 km/h, thus prolonging travelling hours by approx. 20% (e.g. a flight that takes 2 hours today will be 25 minutes longer, or 5 hours will be one hour longer)
2. I can accept that the average speed by car on motorways is reduced to 80 km/h, thus prolonging travelling hours by approx. 30% (e.g. a car trip that takes 6 hours today will be 2 hours longer, 3 hours will be 1 hour longer)
3. None of them
4. I don't know

43. What does it take for you to accept reduced speed, which may mean prolonged travelling hours?

(You may circle more than one answer to this question)

1. That the means of transport will then have a high punctuality (arrives on time and keeps the scheduled travelling time)
2. That the travelling comfort will then be improved
3. That it improves traffic safety and gives fewer road fatalities and casualties
4. That more means of transport will be easy to combine, e.g. train and sharing car services
5. Nothing would make me accept prolonged travelling hours

Policy measures

You will find below some of the policy measures possible to reduce the CO2 emission from long-distance transport, being price manipulation of environmental costs, quota arrangements or information.

44. Please state for each policy measure, how good a tool you find it to be:

A. Road pricing*

1. Very good
2. Good
3. Neither good nor not good
4. Not good
5. Not good at all
6. I don't know

C. Individual carbon allowances*

1. Very good
2. Good
3. Neither good nor not good
4. Not good
5. Not good at all
6. I don't know

D. Carbon tax*

1. Very good
2. Good
3. Neither good nor not good
4. Not good
5. Not good at all
6. I don't know

E. Labelling of bio fuels*

1. Very good
2. Good
3. Neither good nor not good
4. Not good
5. Not good at all
6. I don't know

F. Carbon footprint label*

1. Very good
2. Good
3. Neither good nor not good
4. Not good
5. Not good at all
6. I don't know

Political and financial responsibility

Changes in long-distance transport systems, thereby emitting less CO2, take large investments in infrastructure, research and development. Investments should be given priority. The next questions concern who is responsible to carry through the investments and how the investments should be given priority.

45. Who should have the main responsibility to reduce the CO2 emission from long-distance transport in Europe in the future?

1. Each individual citizen
   - who must change habits into more environmental-friendly transport and consumption habits
2. Corporations and industry (car manufacturers, flight operators, freight companies etc.)
   - Who must make and keep voluntary agreements to develop more environmental-friendly technology
3. The individual EU member countries
   - who must adjust transport nationally
4. The EU
   - who must adjust transport on the EU level
5. I don't know

46. To what extent do you agree or disagree with the following views – please indicate your opinion of each point of view:

A. Decisions about cross-border European transport systems are not a EU matter. They should be taken on a national basis.

1. I completely agree
2. I partly agree
3. I neither agree, nor disagree
4. I partly disagree
5. I completely disagree
6. I am not sure

B. European-wide regulations are needed for efficient land use planning and planning of building infrastructure (cross-border rail network, cross-border road network, airports)

1. I completely agree
2. I partly agree
3. I neither agree, nor disagree
4. I partly disagree
5. I completely disagree
6. I am not sure

C. It is necessary to move more power from the states to the EU in order to enable a European-wide standardisation and regulations that will make the transport system CO2 lean*.

1. I completely agree
2. I partly agree
3. I neither agree, nor disagree
4. I partly disagree
5. I completely disagree
6. I am not sure

47. To which extent do you agree or disagree with the following points of view – please indicate your opinion of each point of view:

A. The tax system should be regulated in such a way that it is cheaper to buy and run an environmental-friendly car and more expensive to drive a car that pollutes a lot.

1. I completely agree
2. I partly agree
3. I neither agree, nor disagree
4. I partly disagree
5. I disagree
6. I am not sure

B. Increased use of bio fuels* presents a problem, if they are produced at the cost of foods

1. I completely agree
2. I partly agree
3. I neither agree, nor disagree
4. I partly disagree
5. I disagree
6. I am not sure

48. Who should pay the majority of the costs of new and less polluting transport systems?

1. All citizens through increased taxes
2. The users of the transport systems
3. Only those who use the particularly polluting means of transport
4. I don't know

49. Which three investments should be given highest priority?

(Circle the three solutions you prefer)

1. New road networks in Europe
2. High-speed rail*
3. Improvement of the European railways* in general
4. New airports
5. Intelligent Transport systems*
6. Research and development of CO2-lean transport technology*

50. Are you willing to pay more in taxes for the following suggestions?

(You may circle more than one answer to this question)

1. New roads through Europe
2. Investments in high-speed rail*
3. The European railways* in general
4. Investments in airports
5. Investments in Intelligent Transport systems*
6. Investments in research and development of CO2-lena transport technology*
7. I am not willing to pay more in taxes

51. On what should the money earned through *road pricing* be spent?

(You may circle more than one answer to this question)

1. New roads
2. High-speed rail*
3. Improvement of the European railways* in general
4. Intelligent Transport systems*
5. Research and development of CO2-lean car technology*
6. I don't know

52. On what should the money earned through *carbon taxation* be spent?

(You may circle more than one answer to this question)

1. High-speed rail*
2. Improvement of the European railways* in general
3. Research and development of CO2-lean sea transport*
4. Intelligent Traffic Control
5. Research and development of CO2-lean air technology*
6. I don't know

Final Questions

You have answered many diverse and detailed questions about long-distance transport. In conclusion, we would like to ask you two final questions.

53. Have you changed your attitude towards long-distance transport in general in the course of completing this questionnaire?

1. Yes, my attitude towards long-distance transport in general has become more positive
2. Yes, my attitude towards long-distance transport in general has become more worried
3. No, I have not changed my attitude
4. I don't know

54. If there are any comments concerning long-distance transport you would like to add or have not had the opportunity to express in this questionnaire, please feel free to make your comments below: *(open text box)*

Your comments

Interview guide

Questions in bold must be discussed by the participants. Subsequent to every question is a short note on the purpose of the question.

To most of the questions there are some subordinated questions. These subordinated questions are inspirational, and can be used to support the discussion if necessary. The subordinated questions do not have to be raised if it is not necessary to inspire the debate.

Interview questions

1. What are your immediate thoughts about long distance transport and global warming?
Purpose of the question: An open question to get the debate started and to give the participants the chance to present their immediate attitudes and to get an idea of how they feel about intervening in long-distance transport with the purpose of reducing CO2 emissions and fight climate change.

Subordinated questions to inspire the debate – only if necessary:
- Do you think the challenges with long distance transport are important to take up now?

- Do you think that enabling long distance transport is more important than reducing CO2 emissions from transport?

[The subordinated questions can be used under Question 2 instead – to make 1 completely open. Anyway, 1 and 2 tend to be intertwined when people answer.]

2. What did the information material and the stories about Maria and John make you think about?
Purpose of the question: Make the participants talk about what they have read in the information material to get an idea of how they perceive the different positive and negative aspects of long distance transport

Subordinated questions to inspire the debate – only if necessary:
- How are the relations in economic growth, mobility and transport, oil dependency, climate change, consumer habits, living standards etc presented in the material?
- Do the stories of John and Maria and the connected facts give ideas of different ways to meet the challenges?

3. What do you see as the most promising ways to reduce CO2 emissions from transport – technological development or change of behavior?

Purpose of question: To make the participants debate the different strategies of focusing on technological potentials or change of behavior towards less traveling and transport of goods

Subordinated questions to inspire the debate – only if necessary:

- Do you think that the technological options for CO2 lean transport are promising?

- Do you find it necessary to limit passenger transport, e.g. by airplane? To limit transport of goods from all over the world? Both or none? ?

4. What do you think about the suggested policy measures that can reduce CO2 emissions from long distance transport?

Purpose of the question: To get the participants opinion on pricing measures and specific behavioral changes, preferences and arguments.

Subordinated questions to inspire the debate – only if necessary:
- What do you think about road pricing, carbon tax and individual carbon allowances?

- What do you think about reducing transport, reducing speed?

- What measures do you in particular prefer and for what purpose?

- Are there any measures that you do not prefer, or do not see as necessary?

5. Who do you think that pricing transport should be targeted at?

Purpose of the question: To get the participants opinion on who should be subject to pricing measures, polluter-pays principle, social equity etc.

Subordinated questions to inspire the debate – only if necessary:
- Should the citizens in general be subject to pricing measures?

- Should those who use the most CO2 producing transport in particular be subject to pricing?

- Should poor people or people living in rural areas be compensated in some ways?

6. How should we spend the revenue from using pricing measures?

Purpose of the question: To get input from the participants on what the money should be spent for – investments in developing CO2 lean transport technologies, road network, public transport.

Subordinated questions to inspire the debate – only if necessary:
- Should road pricing be used for investments in road infrastructure, in rail infrastructure, in public transport?

- Should carbon tax be used for investments in road infrastructure, in rail infrastructure, in public transport?

- Other ideas for using the revenue?

7. What do you see as the most important investments for the future long distance transport?

Purpose of the question: To make the participants debate whether infrastructure for increased transport is more important than investing in technological development, and what infrastructure they will prefer to invest in.

Subordinated questions to inspire the debate – only if necessary:
- Do you find infrastructure investments most important?

- Do you find research and development of CO2 lean transport technologies most important?

- What priority would you give to infrastructure for road and air versus rail?

8. Who should be responsible for reducing CO2 emissions from the transport sector?

Purpose of the question: To get the participants opinion about the role of EU and of the polluter-pays principles

Subordinated questions to inspire the debate – only if necessary:

- How do you see the responsibility of the industry?

- How do you see the responsibility of the member states and of EU as a whole?

- How do you see the responsibility of the individual?

9. Has your participation in today's event changed your attitude towards security technologies and privacy? If so: Why?

Purpose of the question: To find out if information and debate about security technologies and privacy have changed the participants' attitudes toward the subject

10. Do you have any final remarks, points or messages that you would like to ad? (take a round)

Purpose of the question: To give the participants a change to make a last statement before ending the interview meeting

Subordinated questions to inspire the debate – only if necessary:
- Have something made a special impression on you during the conversation?

Rules of thumb

"Rules of thumb" and tips on how to carry out the group interview in a good way.

Introduction

Start by presenting yourself, "My name is … I'm from …, and I'm going to be the moderator at this group conversation. But you just talk and I will make a list of speakers if necessary.

After that you do a presentation round where people say their name and why they have come to the interview meeting

After that the TAPE RECORDER IS STARTED !! This is done in a free-and-easy way and by an easy comment. It is important to create a light atmosphere and play down the seriousness to make sure that the participants are not oppressed by the situation.

The first question is raised and the group interview is on its way.

The first question is always a "brainstorm" question, and a can affect a lot of immediate attitudes. It is important to give space, be open and listen in the beginning.

On the way

It is not important that all participants answer all questions, but the interviewer should have an impression of what they all think.

If anyone is hiding, the interviewer can always ask "Do you agree, John, or what do you think?"

It is important to touch upon all 10 questions. How much time you spend on each depends on what the participants find most important. You need not cover all the sub questions; they are only suggestions for inspiration of the debate.

There will be overlap in questions and answers. Skip questions if they have already been debated and answered

Tick of on the way, when you think that a question have been debated

It is important that all questions are debated. But questions that are more important to the participants than the ones in the interview guide can appear in the discussion and there should always be time to discuss these questions (as long as they are related to the security and privacy debate).

If someone becomes too dominating, it is the interviewers job to bring on the other participants. Ask e.g. "What do the rest of you think?" Interrupt if necessary, it is important that everybody is heard.

If the participants don't say much at the group interview, the interviewer can "take a round" saying that "at the next question I would like to take a round where everybody gives an answer".

Ask for reasons and arguments, "How come you think that… / what is the reason for…

Be aware of the participant's reactions; do they feel comfortable, do they seem under pressure or uneasy etc.

If you are through all the questions before time, you can go back to some of the questions that have not been debated that much on the way.

Closing

When there is 7-8 minutes left, it is a good idea to take a round where everybody gets to make a final remark. The final remark can be things that they have not have the time to state already or points or messages they would like to underline.

You can also ask if something has made a special impression during the conversation.

Annex 4 – Frequency tables

q1 Sex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	40	47,6	47,6	47,6
	Female	44	52,4	52,4	100,0
	Total	84	100,0	100,0	

q3 Persons in household inc self

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	23	27,4	27,4	27,4
	2	22	26,2	26,2	53,6
	3	14	16,7	16,7	70,2
	4 or more	25	29,8	29,8	100,0
	Total	84	100,0	100,0	

q4 Children

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	40	47,6	47,6	47,6
	No	43	51,2	51,2	98,8
	Missing	1	1,2	1,2	100,0
	Total	84	100,0	100,0	

q5 Children home

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	29	34,5	34,5	34,5
	No	55	65,5	65,5	100,0
	Total	84	100,0	100,0	

q6 Education Denmark

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Elementary school - 7 years	0	0	0	0
	Intermediate school - 8 or 9 years	1	4,2	4,2	4,2
	Vocational training (skilled level/craftsman's training	3	12,5	12,5	16,7
	Secondary school (high school)	2	8,3	8,3	25,0
	Short term higher education (less than 3 years of study)	2	8,3	8,3	33,3
	Medium length higher education (3-4 years of study)	8	33,3	33,3	66,7
	Advanced higher education (more than 4 years of study)	8	33,3	33,3	100,0
	Total	24	100,0	100,0	

Q6 Education Greece

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Gymnasium - 7 or 9 years of schooling	1	3,2	3,2	3,2
	Vocational training (skilled level/craftsman's training)	2	6,5	6,5	9,7
	Secondary school (high school graduation)	8	25,8	25,8	35,5
	Higher education (not university)	8	25,8	25,8	61,3
	University degree	10	32,3	32,3	93,5
	Postgraduate	2	6,5	6,5	100,0
	Total	31	100,0	100,0	

q6 Education Hungary

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Elementary (8 classes)	3	10,3	10,3	10,3
	Vocational training	4	13,8	13,8	24,1
	Secondary school	10	34,5	34,5	58,6
	College diploma	9	31,0	31,0	89,7
	University diploma	3	10,3	10,3	100,0
	Total	29	100,0	100,0	

q7 Work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Manager	6	7,1	7,1	7,1
	Worker (unskilled)	4	4,8	4,8	11,9
	Worker (skilled)	8	9,5	9,5	21,4
	Salaried worker/public servant	23	27,4	27,4	48,8
	Self-employed	6	7,1	7,1	56,0
	Apprentice, trainee, student	11	13,1	13,1	69,0
	Old age pensioner, early retirement pensioner	14	16,7	16,7	85,7
	Housewife	2	2,4	2,4	88,1
	Currently on leave of absence	2	2,4	2,4	90,5
	Unemployed	7	8,3	8,3	98,8
	I am not sure	0	0	0	98,8
	I prefer not to answer	1	1,2	1,2	100,0
	Total	84	100,0	100,0	

q8 Frequency long distance travel

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	At least once a week	2	2,4	2,4	2,4
	At least once a month	25	29,8	29,8	32,1
	At least once every 6 month	40	47,6	47,6	79,8
	At least once a year	8	9,5	9,5	89,3
	Less than once a year	8	9,5	9,5	98,8
	I never travel long distance	1	1,2	1,2	100,0
	Total	84	100,0	100,0	

q9 Frequency air travel

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	At least once a week	0	0	0	0
	At least once a month	7	8,3	8,3	8,3
	at least once every 6 months	14	16,7	16,7	25,0
	At least once a year	42	50,0	50,0	75,0
	Less than once a year	21	25,0	25,0	100,0
	I never travel by plane	0	0	0	100,0
	Total	84	100,0	100,0	

q10 Frequency train travel (>150km)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	At least once a week	0	0	0	0
	At least once a month	8	9,5	9,5	9,5
	At least once every six month	19	22,6	22,6	32,1
	At least once a year	12	14,3	14,3	46,4
	Less than once a year	31	36,9	36,9	83,3
	I never travel more than 150km by train	14	16,7	16,7	100,0
	Total	84	100,0	100,0	

q11 Frequency car travel (>150km)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	At least once a week	1	1,2	1,2	1,2
	At least once a month	18	21,4	21,4	22,6
	At least once every 6 month	28	33,3	33,3	56,0
	At least once a year	22	26,2	26,2	82,1
	Less than once a year	9	10,7	10,7	92,9
	I never travel more than 150km by car	6	7,1	7,1	100,0
	Total	84	100,0	100,0	

q12 Purpose of travel (>150km)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Visit friends or family	22	26,2	26,2	26,2
	Work related	6	7,1	7,1	33,3
	Vacation	26	31,0	31,0	64,3
	A mix of three above	26	31,0	31,0	95,2
	Other purpose	2	2,4	2,4	97,6
	I never travel more than 150km	2	2,4	2,4	100,0
	Total	84	100,0	100,0	

q13a Food price

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high influence	7	8,3	8,3	8,3
	High influence	32	38,1	38,1	46,4
	Some influence	36	42,9	42,9	89,3
	Little influence	7	8,3	8,3	97,6
	No influence at all	2	2,4	2,4	100,0
	Total	84	100,0	100,0	

q13b Food quality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high influence	27	32,1	32,1	32,1
	High influence	45	53,6	53,6	85,7
	some influence	11	13,1	13,1	98,8
	Little influence	1	1,2	1,2	100,0
	No influence at all	0	0	0	100,0
	Total	84	100,0	100,0	

q13c Environmental friendly produced food

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high influence	14	16,7	16,7	16,7
	High influence	26	31,0	31,0	47,6
	Some influence	25	29,8	29,8	77,4
	Little influence	12	14,3	14,3	91,7
	No influence at all	7	8,3	8,3	100,0
	Total	84	100,0	100,0	

q13d Foreign produced food

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high influence	17	20,2	20,2	20,2
	High influence	21	25,0	25,0	45,2
	Some influence	24	28,6	28,6	73,8
	Little influence	12	14,3	14,3	88,1
	No influence at all	10	11,9	11,9	100,0
	Total	84	100,0	100,0	

q14a Product price (not food)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high influence	20	23,8	23,8	23,8
	High influence	30	35,7	35,7	59,5
	Some influence	31	36,9	36,9	96,4
	Little influence	3	3,6	3,6	100,0
	No influence at all	0	0	0	100,0
	Total	84	100,0	100,0	

q14b Product quality (not food)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high influence	31	36,9	36,9	36,9
	High influence	45	53,6	53,6	90,5
	Some influence	7	8,3	8,3	98,8
	Little influence	1	1,2	1,2	100,0
	No influence at all	0	0	0	100,0
	Total	84	100,0	100,0	

q14c Environmental friendly produced product (non food)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high influence	12	14,3	14,3	14,3
	High influence	24	28,6	28,6	42,9
	Some influence	28	33,3	33,3	76,2
	Little influence	11	13,1	13,1	89,3
	No influence at all	9	10,7	10,7	100,0
	Total	84	100,0	100,0	

q14d Foreign produced product (not food)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high influence	15	17,9	17,9	17,9
	High influence	18	21,4	21,4	39,3
	Some influence	24	28,6	28,6	67,9
	Little influence	14	16,7	16,7	84,5
	No influence at all	13	15,5	15,5	100,0
	Total	84	100,0	100,0	

q15 Travel distance of food

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes and it influences my choice of goods	18	21,4	21,4	21,4
	Yes, but it does not influence my choice of goods	29	34,5	34,5	56,0
	No, I do not think about	35	41,7	41,7	97,6
	I don't know	2	2,4	2,4	100,0
	Total	84	100,0	100,0	

q16 Travel distance of products (non food)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes, and it influences my choice of goods	8	9,5	9,5	9,5
	Yes, but I does not influence my choice of goods	28	33,3	33,3	42,9
	No, I do not think about it	46	54,8	54,8	97,6
	I don't know	2	2,4	2,4	100,0
	Total	84	100,0	100,0	

q17 Mode of transportation for products

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes, and it influences on my choice of goods	9	10,7	10,7	10,7
	Yes, but it does not influence on my choice of goods	18	21,4	21,4	32,1
	No, I do not think about it	57	67,9	67,9	100,0
	Total	84	100,0	100,0	

q18 Product CO2 emission during production

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes, and it influences on my choice of goods	13	15,5	15,5	15,5
	Yes, but it does not influence on my choice of goods	19	22,6	22,6	38,1
	No, I do not think about it	50	59,5	59,5	97,6
	I don’t know	2	2,4	2,4	100,0
	Total	84	100,0	100,0	

q19 how important is mobility to the economy

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high importance	41	48,8	48,8	48,8
	High importance	41	48,8	48,8	97,6
	Some importance	2	2,4	2,4	100,0
	Little importance	0	0	0	100,0
	No importance at all	0	0	0	100,0
	Total	84	100,0	100,0	

q20 how important is it for you to be easily and efficiently transported across EU

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high importance	24	28,6	28,6	28,6
	High importance	27	32,1	32,1	60,7
	Some importance	25	29,8	29,8	90,5
	Little importance	7	8,3	8,3	98,8
	No importance at all	1	1,2	1,2	100,0
	Total	84	100,0	100,0	

q21 how important is economic growth to general economics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high importance	48	57,1	57,1	57,1
	High importance	29	34,5	34,5	91,7
	Some importance	7	8,3	8,3	100,0
	Little importance	0	0	0	100,0
	No importance at all	0	0	0	100,0
	Total	84	100,0	100,0	

q22 Importance of buying products from all around Europe

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high importance	7	8,3	8,3	8,3
	High importance	29	34,5	34,5	42,9
	Some importance	30	35,7	35,7	78,6
	Little importance	11	13,1	13,1	91,7
	No importance at all	7	8,3	8,3	100,0
	Total	84	100,0	100,0	

q23 Importance of buying products from all around the world

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high importance	6	7,1	7,1	7,1
	High importance	27	32,1	32,1	39,3
	Some importance	28	33,3	33,3	72,6
	Little importance	17	20,2	20,2	92,9
	No importance at all	6	7,1	7,1	100,0
	Total	84	100,0	100,0	

q24 Importance of protecting nature resorts in Europe

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high importance	56	66,7	66,7	66,7
	High importance	22	26,2	26,2	92,9
	Some importance	5	6,0	6,0	98,8
	Little importance	1	1,2	1,2	100,0
	No importance at all	0	0	0	100,0
	Total	84	100,0	100,0	

q25 Importance of fighting global warming

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high importance	70	83,3	83,3	83,3
	High importance	11	13,1	13,1	96,4
	Some importance	2	2,4	2,4	98,8
	Little importance	1	1,2	1,2	100,0
	No importance at all	0	0	0	100,0
	Total	84	100,0	100,0	

q26 Worry about CO2 emissions from transport

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	82	97,6	97,6	97,6
	No	2	2,4	2,4	100,0
	I don’t know	0	0	0	100,0
	Total	84	100,0	100,0	

q27 Worry about oil dependency in transport

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	75	89,3	89,3	89,3
	No	6	7,1	7,1	96,4
	I don’t know	3	3,6	3,6	100,0
	Total	84	100,0	100,0	

q28 most important, economic growth or fight against global warming

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Economic growth is most important	2	2,4	2,4	2,4
	To take action on climate change is most important	42	50,0	50,0	52,4
	They are equally important	39	46,4	46,4	98,8
	I don’t know	1	1,2	1,2	100,0
	Total	84	100,0	100,0	

q29 most important, mobility or fight against global warming

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Mobility is most important	1	1,2	1,2	1,2
	To take action on climate change is most important	42	50,0	50,0	51,2
	They are equally important	40	47,6	47,6	98,8
	I don’t know	1	1,2	1,2	100,0
	Total	84	100,0	100,0	

q30 most important, economic growth or protection of nature resorts

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Economic growth is most important	2	2,4	2,4	2,4
	Protection of nature resorts is most important	48	57,1	57,1	59,5
	They are equally important	34	40,5	40,5	100,0
	None of them are important	0	0	0	100,0
	I don't know	0	0	0	100,0
	Total	84	100,0	100,0	

q31 most important, mobility or protection of nature resorts

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Mobility is most important	2	2,4	2,4	2,4
	Protection of nature resorts is most important	46	54,8	54,8	57,1
	They are equally important	35	41,7	41,7	98,8
	None of them are important	0	0	0	98,8
	I don't know	1	1,2	1,2	100,0
	Total	84	100,0	100,0	

q32-1 Reduction of passenger transport

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	81	96,4	96,4	96,4
	Yes	3	3,6	3,6	100,0
	Total	84	100,0	100,0	

q32-2 Reduction of freight transport

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	77	91,7	91,7	91,7
	Yes	7	8,3	8,3	100,0
	Total	84	100,0	100,0	

q32-3 Further development of non-emitting fuels and technologies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	11	13,1	13,1	13,1
	Yes	73	86,9	86,9	100,0
	Total	84	100,0	100,0	

q-32-4 Using ITC

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	31	36,9	36,9	36,9
	Yes	53	63,1	63,1	100,0
	Total	84	100,0	100,0	

q32-5 Increase taxes and duties on CO2 emitting transport

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	67	79,8	79,8	79,8
	Yes	17	20,2	20,2	100,0
	Total	84	100,0	100,0	

q32-6 Emphasise the use of less CO2 emitting transport

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	28	33,3	33,3	33,3
	Yes	56	66,7	66,7	100,0
	Total	84	100,0	100,0	

q32-7 Speed reduction for air and car

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	71	84,5	84,5	84,5
	Yes	13	15,5	15,5	100,0
	Total	84	100,0	100,0	

q32-8 Improved information on the CO2 emission of transport

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	68	81,0	81,0	81,0
	Yes	16	19,0	19,0	100,0
	Total	84	100,0	100,0	

q32-9 (exclusive) don't know

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	84	100,0	100,0	100,0
	Yes	0	0	0	100,0
	Total	84	100,0	100,0	

q33-1 Accept fewer holiday trips

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	56	66,7	66,7	66,7
	Yes	28	33,3	33,3	100,0
	Total	84	100,0	100,0	

q33-2 Accept fewer business trips

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	57	67,9	67,9	67,9
	Yes	27	32,1	32,1	100,0
	Total	84	100,0	100,0	

q33-3 Accept smaller variety of goods from abroad

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	23	27,4	27,4	27,4
	Yes	61	72,6	72,6	100,0
	Total	84	100,0	100,0	

q33-4 Accept increased prices on daily necessities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	77	91,7	91,7	91,7
	Yes	7	8,3	8,3	100,0
	Total	84	100,0	100,0	

q33-5 Accept increased prices on daily necessities with large CO2 footprint

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	41	48,8	48,8	48,8
	Yes	43	51,2	51,2	100,0
	Total	84	100,0	100,0	

q33-6 Accept increased prices on clothes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	71	84,5	84,5	84,5
	Yes	13	15,5	15,5	100,0
	Total	84	100,0	100,0	

q33-7 not willing to accept any of the above consequences

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	80	95,2	95,2	95,2
	Yes	4	4,8	4,8	100,0
	Total	84	100,0	100,0	

q34 Increased prices on transport if reducing global warming

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Double price	3	3,6	3,6	3,6
	50% more	10	11,9	11,9	15,5
	25% more	9	10,7	10,7	26,2
	10% more	25	29,8	29,8	56,0
	Not willing to pay more	24	28,6	28,6	84,5
	I don’t know	12	14,3	14,3	98,8
	99	1	1,2	1,2	100,0
	Total	84	100,0	100,0	

q35 How much more expensive should travel by car be before you choose train Hungary

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Double price	8	27,6	27,6	27,6
	50% price	4	13,8	13,8	41,4
	25% more	3	10,3	10,3	51,7
	10%	1	3,4	3,4	55,2
	I am not willing to pay more	3	10,3	10,3	65,5
	I don’t know	8	27,6	27,6	93,1
	I choose the train anyway	2	6,9	6,9	100,0
	Total	29	100,0	100,0	

q36 How much more expensive should travel by plane be before you choose train Hungary

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Double price	10	34,5	34,5	34,5
	50% more	6	20,7	20,7	55,2
	25% more	1	3,4	3,4	58,6
	10% more	2	6,9	6,9	65,5
	I am not willing to pay more	3	10,3	10,3	75,9
	I don't know	5	17,2	17,2	93,1
	I choose the train anyway	2	6,9	6,9	100,0
	Total	29	100,0	100,0	

q35 Increased price in air transport before choosing train Denmark

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Double price	5	20,8	20,8	20,8
	50% more	4	16,7	16,7	37,5
	25% more	3	12,5	12,5	50,0
	10% more	0	0	0	50,0
	I always travel by train	3	12,5	12,5	62,5
	I will never replace a air travel with train	4	16,7	16,7	79,2
	Don't know	5	20,8	20,8	100,0
	Total	24	100,0	100,0	

q36 Increased price on car transport before choosing train Denmark

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Double price	6	25,0	25,0	25,0
	50% more	0	0	0	25,0
	25% more	6	25,0	25,0	50,0
	10% more	1	4,2	4,2	54,2
	I always travel by train	7	29,2	29,2	83,3
	I will not replace a car travel with train	3	12,5	12,5	95,8
	Don't know	1	4,2	4,2	100,0
	Total	24	100,0	100,0	

Q35 How much more expensive should travel by car be before you choose train Greece

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Double price	5	16,1	16,1	16,1
	50% more	9	29,0	29,0	45,2
	25% more	5	16,1	16,1	61,3
	10% more	3	9,7	9,7	71,0
	I always travel by train anyway	1	3,2	3,2	74,2
	I will never choose train instead of car	3	9,7	9,7	83,9
	I don't know	5	16,1	16,1	100,0
	Total	31	100,0	100,0	

Q36 How much more expensive should travel by plane be before you choose train Greece

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Double price	6	19,4	19,4	19,4
	50% more	9	29,0	29,0	48,4
	25% more	1	3,2	3,2	51,6
	10% more	4	12,9	12,9	64,5
	I always travel by train anyway	5	16,1	16,1	80,6
	I will never choose train instead of air	2	6,5	6,5	87,1
	I don't know	4	12,9	12,9	100,0
	Total	31	100,0	100,0	

q37 Increase in food prices from abroad if reducing global warming

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Double price	3	3,6	3,6	3,6
	50% more	8	9,5	9,5	13,1
	25% more	11	13,1	13,1	26,2
	10% more	28	33,3	33,3	59,5
	I am not willing to pay more	29	34,5	34,5	94,0
	I don't know	5	6,0	6,0	100,0
	Total	84	100,0	100,0	

q38 Increase in product prices (not food) if reducing global warming

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Double price	2	2,4	2,4	2,4
	50% more	9	10,7	10,7	13,1
	25% more	14	16,7	16,7	29,8
	10% more	30	35,7	35,7	65,5
	I am not willing to pay more	23	27,4	27,4	92,9
	Don’t know	5	6,0	6,0	98,8
	Missing	1	1,2	1,2	100,0
	Total	84	100,0	100,0	

q39-1Air travel should be more expensive

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	47	56,0	56,0	56,0
	Yes	37	44,0	44,0	100,0
	Total	84	100,0	100,0	

q39-2 Train should be more expensive

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	80	95,2	95,2	95,2
	Yes	4	4,8	4,8	100,0
	Total	84	100,0	100,0	

q39-3 Car should be more expensive

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	48	57,1	57,1	57,1
	Yes	36	42,9	42,9	100,0
	Total	84	100,0	100,0	

q39-4 (exclusive) No transport should be more expensive

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	63	75,0	75,0	75,0
	Yes	21	25,0	25,0	100,0
	Total	84	100,0	100,0	

q39-5 (exclusive) don't know

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	77	91,7	91,7	91,7
	Yes	7	8,3	8,3	100,0
	Total	84	100,0	100,0	

Greece

Q40_1 Limits global warming

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	11	35,5	35,5	35,5
	Yes	20	64,5	64,5	100,0
	Total	31	100,0	100,0	

Q40_2 Less expensive

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No		48,4	48,4	48,4
	Yes		51,6	51,6	100,0
	Total		100,0	100,0	

Q40_3 More comfortable

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	18	58,1	58,1	58,1
	Yes	13	41,9	41,9	100,0
	Total	31	100,0	100,0	

Q40_4 travelling hours are the same

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	27	87,1	87,1	87,1
	Yes	4	12,9	12,9	100,0
	Total	31	100,0	100,0	

Q40_5 Never choose means of transport based on CO2 emission

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	30	96,8	96,8	96,8
	Yes	1	3,2	3,2	100,0
	Total	31	100,0	100,0	

Hungary

q40-1 Limits global warming

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	16	55,2	55,2	55,2
	Yes	13	44,8	44,8	100,0
	Total	29	100,0	100,0	

q40-2 less expensive

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	11	37,9	37,9	37,9
	Yes	18	62,1	62,1	100,0
	Total	29	100,0	100,0	

q40-3 more comfortable

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	19	65,5	65,5	65,5
	Yes	10	34,5	34,5	100,0
	Total	29	100,0	100,0	

q40-4 travelling hours is the same

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	16	55,2	55,2	55,2
	Yes	13	44,8	44,8	100,0
	Total	29	100,0	100,0	

q40-5 never choose means of transport based on CO2 emission

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	29	100,0	100,0	100,0

Denmark

q40 most convincing argument to get you to change means of transport with lower CO2 emm.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Limits climate change	6	25,0	25,0	25,0
	Less expensive	8	33,3	33,3	58,3
	More comfortable travel	2	8,3	8,3	66,7
	Travelling time is the same	5	20,8	20,8	87,5
	Never choose means of transport based on CO2 emm	1	4,2	4,2	91,7
	Don't know	2	8,3	8,3	100,0
	Total	24	100,0	100,0	

q41-1 Preventing global warming

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	54	64,3	64,3	64,3
	Yes	30	35,7	35,7	100,0
	Total	84	100,0	100,0	

q41-2 longer travel times

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	61	72,6	72,6	72,6
	Yes	23	27,4	27,4	100,0
	Total	84	100,0	100,0	

q41-3 Virtual meetings are easier

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	51	60,7	60,7	60,7
	Yes	33	39,3	39,3	100,0
	Total	84	100,0	100,0	

q41-4 (exclusive) don't know

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	69	82,1	82,1	82,1
	Yes	15	17,9	17,9	100,0
	Total	84	100,0	100,0	

q42-1 Reduction of air travel speed to 700kmt prolonging travels with 20%

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	25	29,8	29,8	29,8
	Yes	59	70,2	70,2	100,0
	Total	84	100,0	100,0	

q42-2 Reduction of average speed with car to 80kmt prolonging travels with 30%

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	40	47,6	47,6	47,6
	Yes	44	52,4	52,4	100,0
	Total	84	100,0	100,0	

q42-3 (exclusive) none of the above

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	72	85,7	85,7	85,7
	Yes	12	14,3	14,3	100,0
	Total	84	100,0	100,0	

q42-4 (exclusive) don't know

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	82	97,6	97,6	97,6
	Yes	2	2,4	2,4	100,0
	Total	84	100,0	100,0	

q43-1 Transport is reliable and on time

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	31	36,9	36,9	36,9
	Yes	53	63,1	63,1	100,0
	Total	84	100,0	100,0	

q43-2 Better comfort

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	53	63,1	63,1	63,1
	Yes	31	36,9	36,9	100,0
	Total	84	100,0	100,0	

q43-3 Better security

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No		39,3	39,3	39,3
	Yes		60,7	60,7	100,0
	Total		100,0	100,0	

q43-4 Easier to combine different means of transport

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	54	64,3	64,3	64,3
	Yes	30	35,7	35,7	100,0
	Total	84	100,0	100,0	

q43-5 nothing can make me accepts longer travel time

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	80	95,2	95,2	95,2
	Yes	4	4,8	4,8	100,0
	Total	84	100,0	100,0	

q44a Road pricing as policy measure

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very good	12	14,3	14,3	14,3
	Good	25	29,8	29,8	44,0
	Neither good or not good	16	19,0	19,0	63,1
	Not good	15	17,9	17,9	81,0
	Not good at all	15	17,9	17,9	98,8
	Don’t know	1	1,2	1,2	100,0
	Total	84	100,0	100,0	

q44b Individual carbon allowances as policy measure

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very good	11	13,1	13,1	13,1
	Good	28	33,3	33,3	46,4
	Neither good or not good	19	22,6	22,6	69,0
	Not good	7	8,3	8,3	77,4
	Not good at all	14	16,7	16,7	94,0
	Don't know	5	6,0	6,0	100,0
	Total	84	100,0	100,0	

q44c Carbon tax as policy measure

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very good	14	16,7	16,7	16,7
	Good	28	33,3	33,3	50,0
	Neither good or not good	13	15,5	15,5	65,5
	Not good	11	13,1	13,1	78,6
	Not good at all	9	10,7	10,7	89,3
	Don't know	9	10,7	10,7	100,0
	Total	84	100,0	100,0	

q44d Labelling of bio fuels as policy measure

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very good	21	25,0	25,0	25,0
	Good	36	42,9	42,9	67,9
	Neither good or not good	14	16,7	16,7	84,5
	Not good	6	7,1	7,1	91,7
	Not good at all	2	2,4	2,4	94,0
	Don't know	5	6,0	6,0	100,0
	Total	84	100,0	100,0	

q44e Carbon footprint label as policy measure

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very good	28	33,3	33,3	33,3
	Good	34	40,5	40,5	73,8
	Neither good or not good	14	16,7	16,7	90,5
	Not good	2	2,4	2,4	92,9
	Not good at all	2	2,4	2,4	95,2
	Don’t know	4	4,8	4,8	100,0
	Total	84	100,0	100,0	

q45 Responsibility for reducing CO2 emissions from long distance transport in Europe

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Each individual citizen	10	11,9	11,9	11,9
	Corporations and industry	28	33,3	33,3	45,2
	The individual EU member countries	9	10,7	10,7	56,0
	The EU	33	39,3	39,3	95,2
	Don’t know	4	4,8	4,8	100,0
	Total	84	100,0	100,0	

q46a Decisions regarding transport should be made national and not on EU level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I completely agree	9	10,7	10,7	10,7
	I partly agree	17	20,2	20,2	31,0
	I neither agree, nor disagree	12	14,3	14,3	45,2
	I partly disagree	23	27,4	27,4	72,6
	I completely disagree	19	22,6	22,6	95,2
	Not sure	4	4,8	4,8	100,0
	Total	84	100,0	100,0	

q46b it is necessary with EU wide regulations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I completely agree	44	52,4	52,4	52,4
	I partly agree	30	35,7	35,7	88,1
	I neither agree, nor disagree	5	6,0	6,0	94,0
	I partly disagree	1	1,2	1,2	95,2
	I completely disagree	1	1,2	1,2	96,4
	Not sure	3	3,6	3,6	100,0
	Total	84	100,0	100,0	

q46c Move more power from the national states to the EU

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I completely agree	31	36,9	36,9	36,9
	I partly agree	37	44,0	44,0	81,0
	I neither agree, nor disagree	8	9,5	9,5	90,5
	I partly disagree	3	3,6	3,6	94,0
	I completely disagree	2	2,4	2,4	96,4
	Not sure	3	3,6	3,6	100,0
	Total	84	100,0	100,0	

q47a Taxes should be regulated in a way that makes environmental friendly cars cheaper

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I completely agree	71	84,5	84,5	84,5
	I partly agree	9	10,7	10,7	95,2
	I neither agree, nor disagree	3	3,6	3,6	98,8
	I partly disagree	0	0	0	98,8
	I completely disagree	0	0	0	98,8
	Not sure	1	1,2	1,2	100,0
	Total	84	100,0	100,0	

q47bBiofuels is a problem if produced at the cost of foods

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I completely agree	40	47,6	47,6	47,6
	I partly agree	23	27,4	27,4	75,0
	I neither agree, nor disagree	9	10,7	10,7	85,7
	I partly disagree	1	1,2	1,2	86,9
	I completely disagree	4	4,8	4,8	91,7
	Not sure	7	8,3	8,3	100,0
	Total	84	100,0	100,0	

q48 who should pay for less polluting transport systems

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	All citizens through increased taxes	13	15,5	15,5	15,5
	The users of the transport system	35	41,7	41,7	57,1
	Only those who use the most polluting means of transport	28	33,3	33,3	90,5
	Don’t know	7	8,3	8,3	98,8
	Other	1	1,2	1,2	100,0
	Total	84	100,0	100,0	

q49-1 new roads

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	61	72,6	72,6	72,6
	Yes	23	27,4	27,4	100,0
	Total	84	100,0	100,0	

q49-2 High-speed trains

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	53	63,1	63,1	63,1
	Yes	31	36,9	36,9	100,0
	Total	84	100,0	100,0	

q49-3 Improvement of EU railways

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	31	36,9	36,9	36,9
	Yes	53	63,1	63,1	100,0
	Total	84	100,0	100,0	

q49-4 new airports

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	84	100,0	100,0	100,0
	Yes	0	0	0	100,0
	Total	84	100,0	100,0	

q49-5 intelligent traffic control

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	21	25,0	25,0	25,0
	Yes	63	75,0	75,0	100,0
	Total	84	100,0	100,0	

q49-6 Research and development of new less CO2 emm technology

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	15	17,9	17,9	17,9
	Yes	69	82,1	82,1	100,0
	Total	84	100,0	100,0	

q50-1 new roads in Europe

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	75	89,3	89,3	89,3
	Yes	9	10,7	10,7	100,0
	Total	84	100,0	100,0	

q50-2 Investment in high-speed train

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	64	76,2	76,2	76,2
	Yes	20	23,8	23,8	100,0
	Total	84	100,0	100,0	

q50-3 Improvement of railways

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	50	59,5	59,5	59,5
	Yes	34	40,5	40,5	100,0
	Total	84	100,0	100,0	

q50-4 Investment in airports

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	82	97,6	97,6	97,6
	Yes	2	2,4	2,4	100,0
	Total	84	100,0	100,0	

q50-5 Investment in Intelligent traffic control

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	53	63,1	63,1	63,1
	Yes	31	36,9	36,9	100,0
	Total	84	100,0	100,0	

q50-6 Investment in CO2 efficient transport technology

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	36	42,9	42,9	42,9
	Yes	48	57,1	57,1	100,0
	Total	84	100,0	100,0	

q50-7 (exclusive) No more taxes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	58	69,0	69,0	69,0
	Yes	26	31,0	31,0	100,0
	Total	84	100,0	100,0	

q51-1New roads

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	56	66,7	66,7	66,7
	Yes	28	33,3	33,3	100,0
	Total	84	100,0	100,0	

q51-2 High-speed train

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	63	75,0	75,0	75,0
	Yes	21	25,0	25,0	100,0
	Total	84	100,0	100,0	

q51-3 European railways

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	46	54,8	54,8	54,8
	Yes	38	45,2	45,2	100,0
	Total	84	100,0	100,0	

q51-4 ITC

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	35	41,7	41,7	41,7
	Yes	49	58,3	58,3	100,0
	Total	84	100,0	100,0	

q51-5 CO2 efficient car technology

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	20	23,8	23,8	23,8
	Yes	64	76,2	76,2	100,0
	Total	84	100,0	100,0	

q51-6 (exclusive) don’t know

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	83	98,8	98,8	98,8
	Yes	1	1,2	1,2	100,0
	Total	84	100,0	100,0	

q52-1 High-speed train

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	62	73,8	73,8	73,8
	Yes	22	26,2	26,2	100,0
	Total	84	100,0	100,0	

q52-2 European railways

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	42	50,0	50,0	50,0
	Yes	42	50,0	50,0	100,0
	Total	84	100,0	100,0	

q52-3 CO2 efficient shipping technology

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	32	38,1	38,1	38,1
	Yes	52	61,9	61,9	100,0
	Total	84	100,0	100,0	

q52-4 ITC

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	44	52,4	52,4	52,4
	Yes	40	47,6	47,6	100,0
	Total	84	100,0	100,0	

q52-5 CO2 efficient airplane technology

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	30	35,7	35,7	35,7
	Yes	54	64,3	64,3	100,0
	Total	84	100,0	100,0	

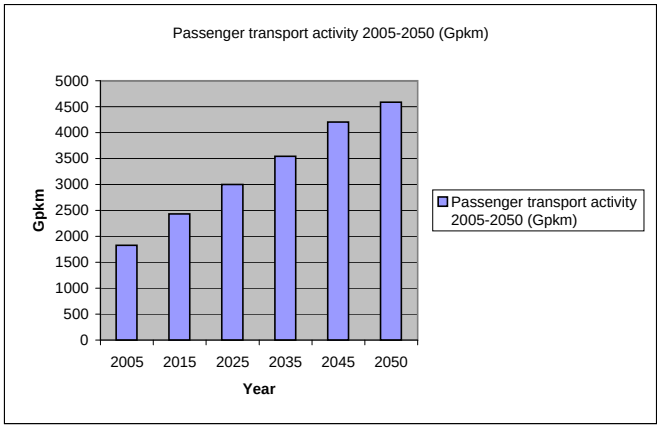
q52-6 (exclusive) don't know

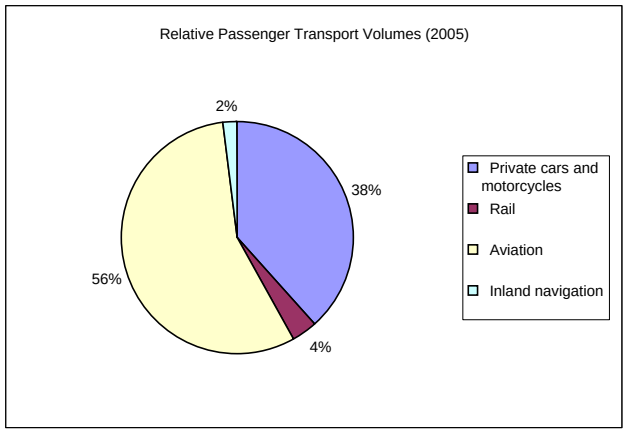
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	82	97,6	97,6	97,6
	Yes	2	2,4	2,4	100,0
	Total	84	100,0	100,0	

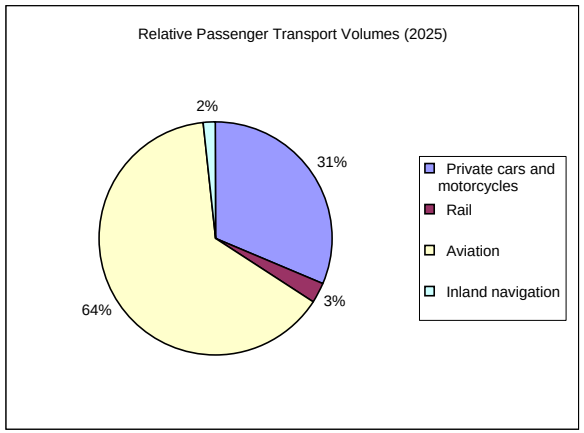
q53 Have you changed your attitude towards LDT while doing the questionnaire

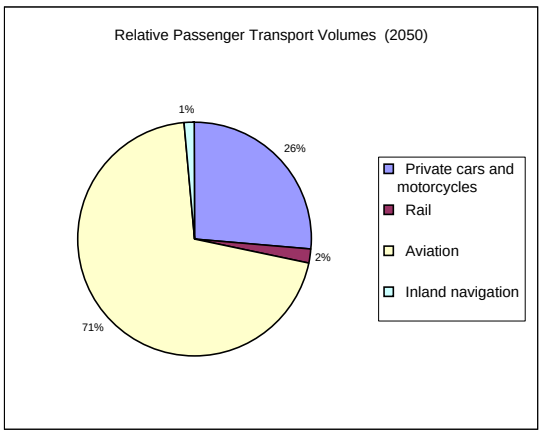
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More positive attitude	6	7,1	7,1	7,1
	More negative attitude	39	46,4	46,4	53,6
	No change in attitude	34	40,5	40,5	94,0
	Don’t know	5	6,0	6,0	100,0
	Total	84	100,0	100,0	

	2005	2015	2025	2035	2045	2050
Passenger transport activity Total (Gpkm)	**1827**	**2431**	**2998**	**3542**	**4205**	**4585**
Private cars and motorcycles	700	833	944	1039	1150	1210
Rail	65	71	77	81	87	89
Aviation	1026	1485	1929	2369	2911	3226
Inland navigation	37	43	48	52	57	59

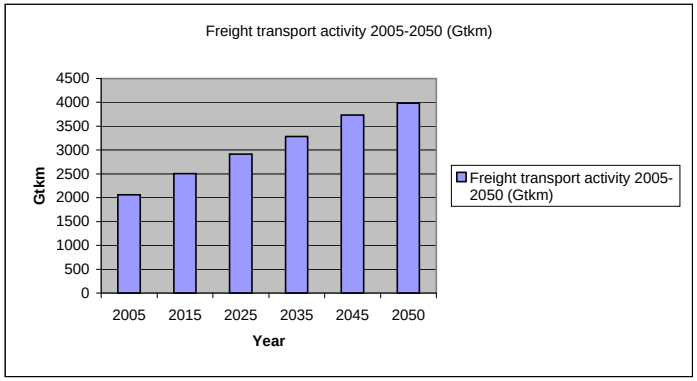


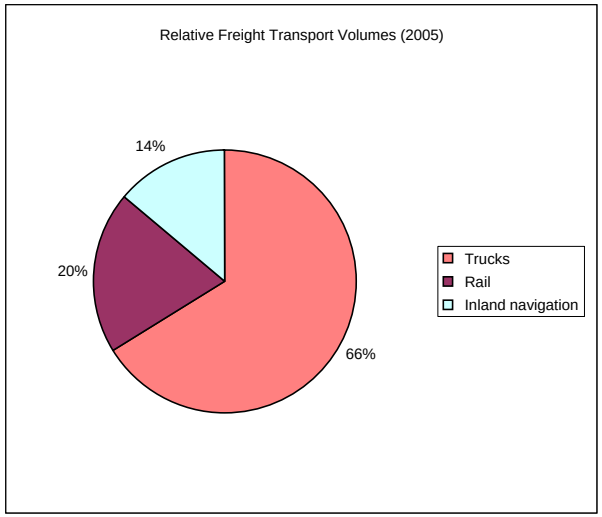


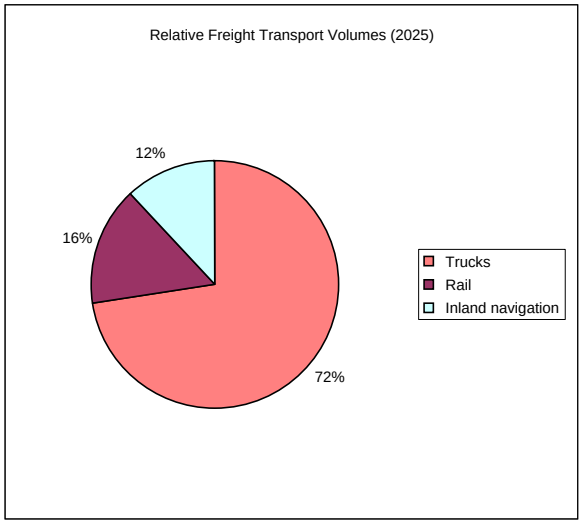


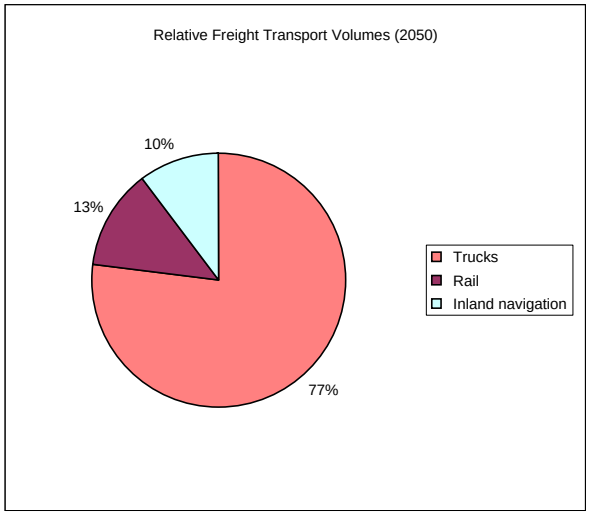


	2005	2015	2025	2035	2045	2050
Freight transport activity Total (Gtkm)	**2060**	**2505**	**2912**	**3283**	**3733**	**3983**
Trucks	1364	1751	2111	2438	2839	3064
Rail	410	438	457	476	498	508
Inland navigation	286	316	344	368	396	411

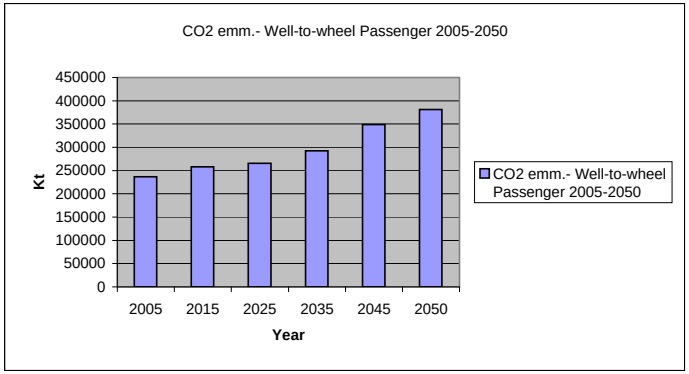


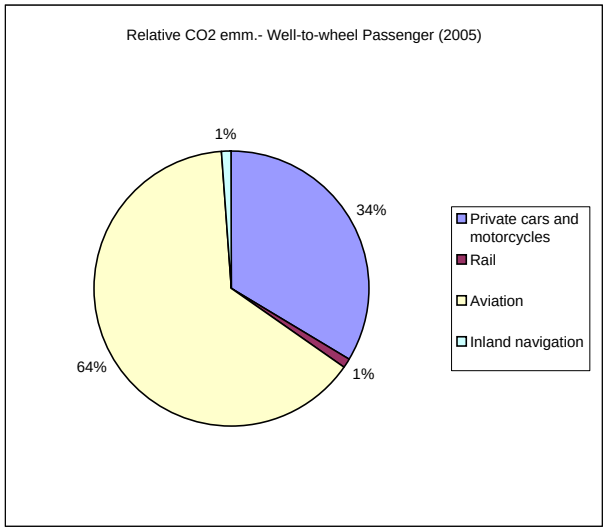


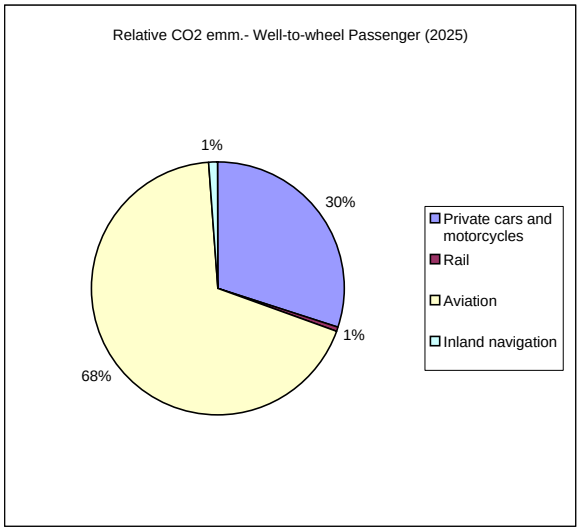


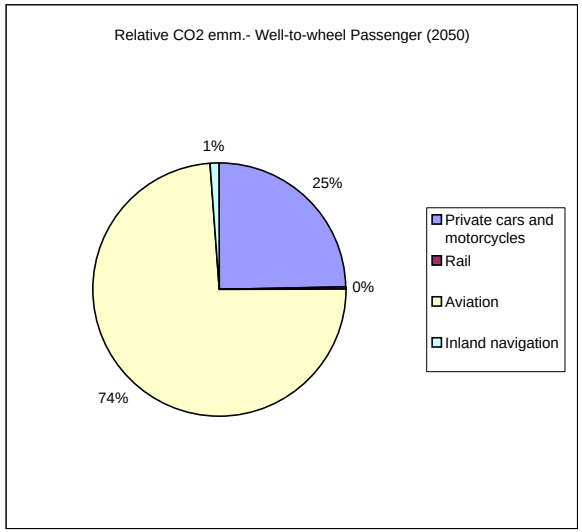


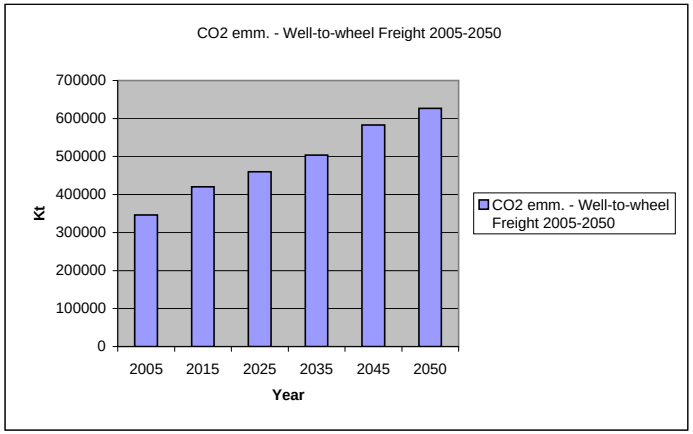
	2005	2015	2025	2035	2045	2050
CO2 emm., Well-to-wheel, passenger transport (kt)	**236430**	**258118**	**265254**	**292564**	**348856**	**381213**
Private cars and motorcycles	79591	77923	79548	80744	89342	93979
Rail	2555	1987	1603	1597	1700	1754
Aviation	151789	175329	180912	206801	254066	281607
Inland navigation	2496	2878	3191	3422	3747	3872



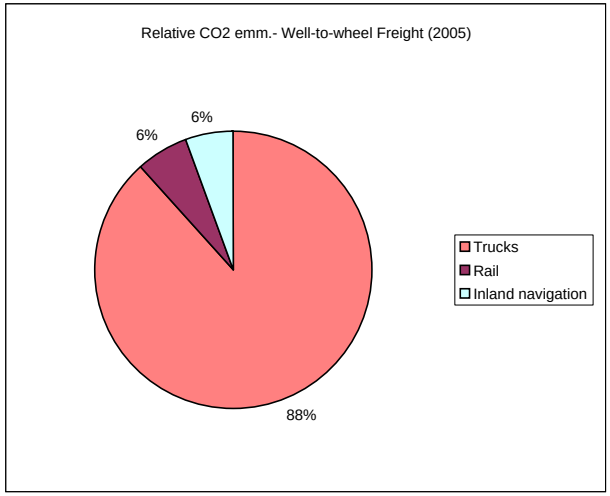


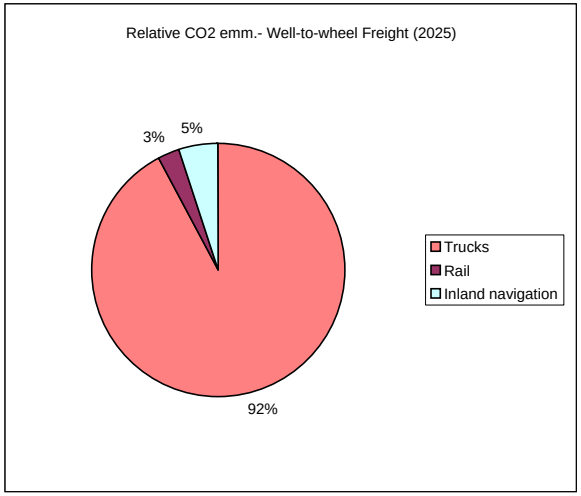


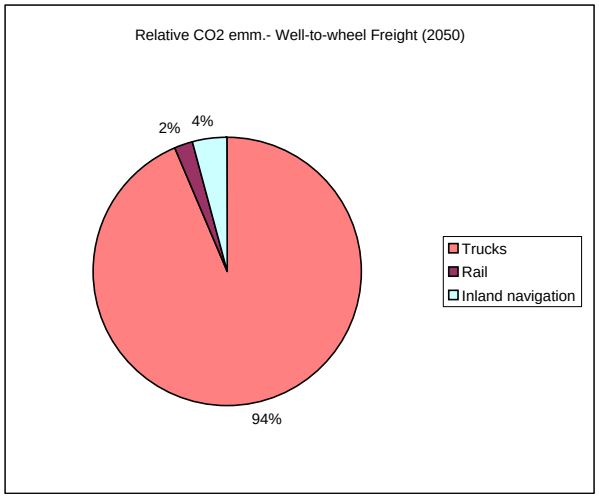


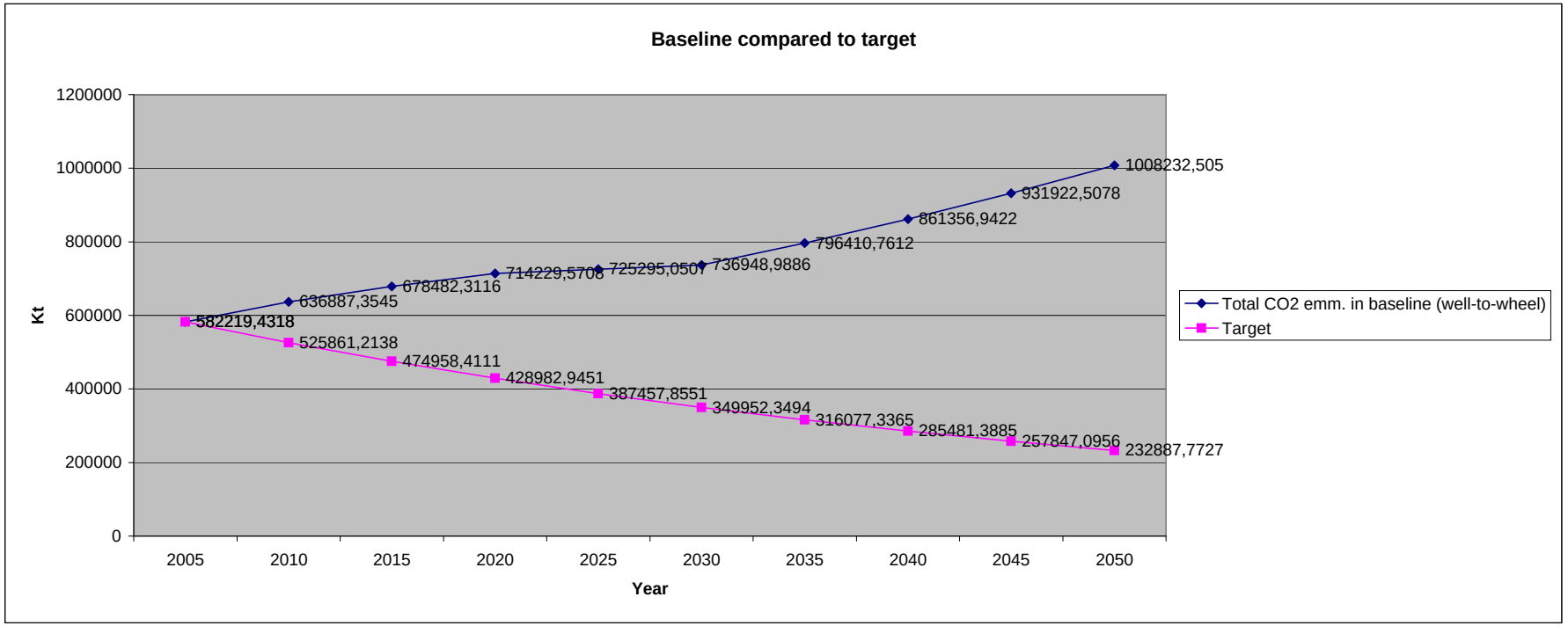


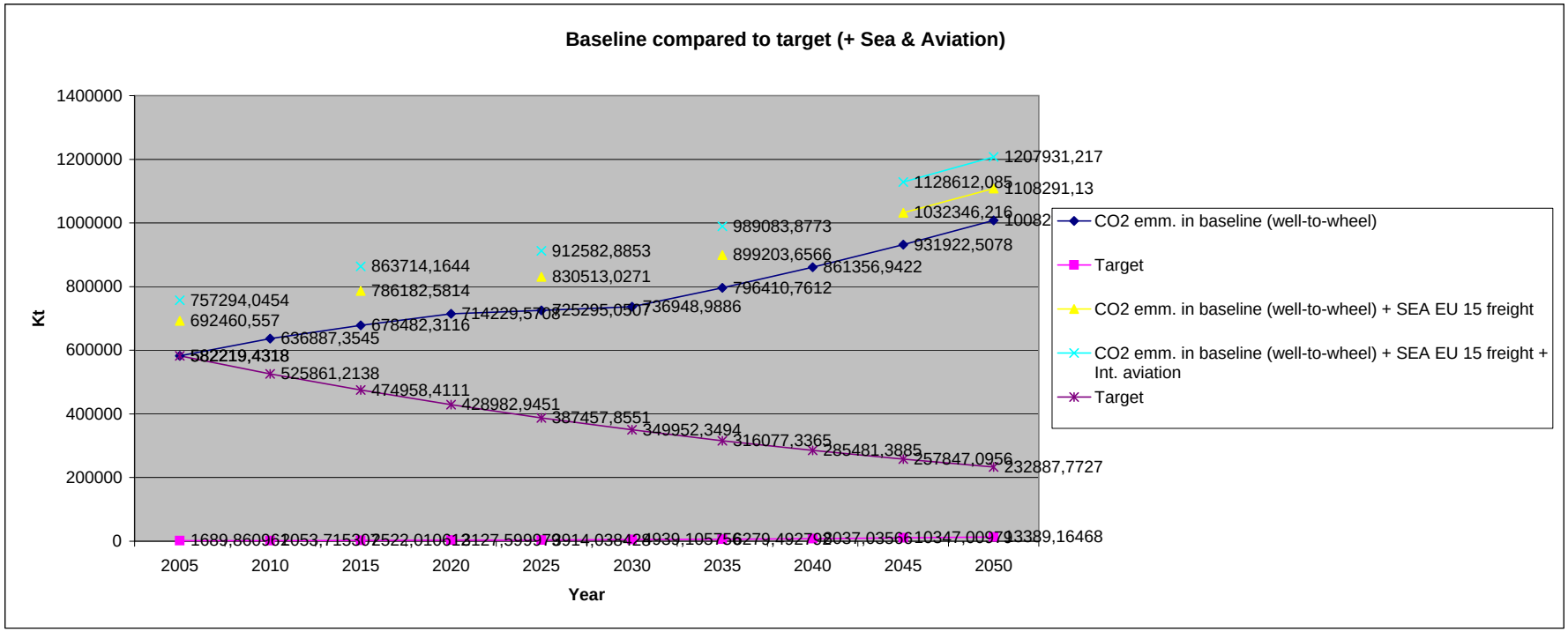
	2005	2015	2025	2035	2045	2050
CO2 emm., Well-to-wheel, freight transport (kt)	**345789**	**420365**	**460041**	**503847**	**583067**	**627020**
Trucks	305686	383467	424312	467211	544053	587090
Rail	20527	15562	12762	12355	12903	13187
Inland navigation	19576	21336	22968	24280	26111	26743


Relative CO2 emm.- Well-to-wheel Freight (2005)
6%
6%
88%
Trucks
Rail
Inland navigation

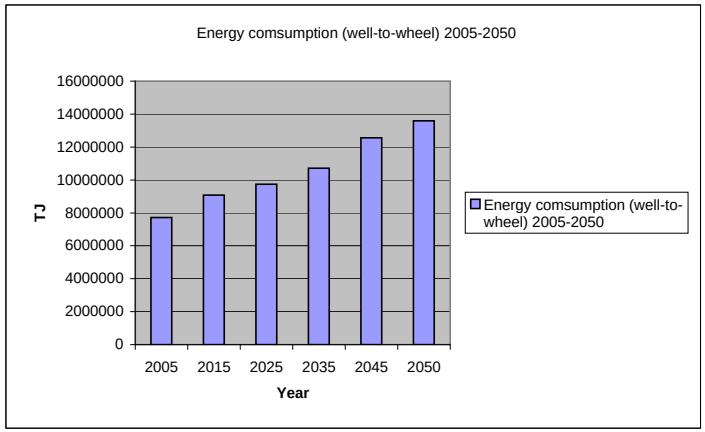

Relative CO2 emm.- Well-to-wheel Freight (2025)
3%
5%
92%
Trucks
Rail
Inland navigation

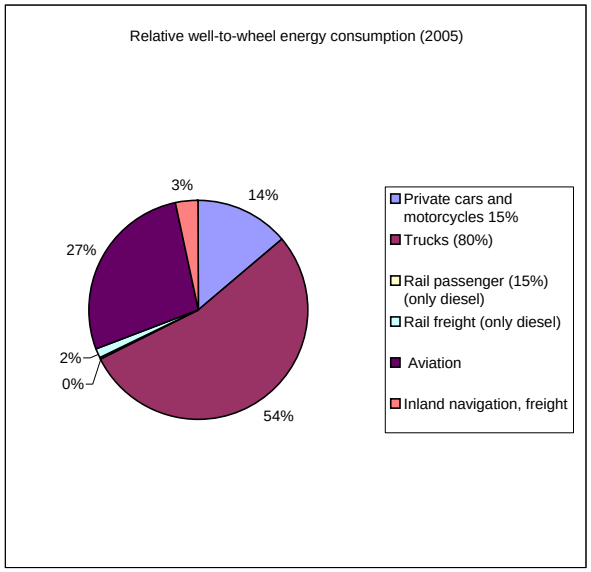

Relative CO2 emm.- Well-to-wheel Freight (2050)
2%
4%
94%
Trucks
Rail
Inland navigation

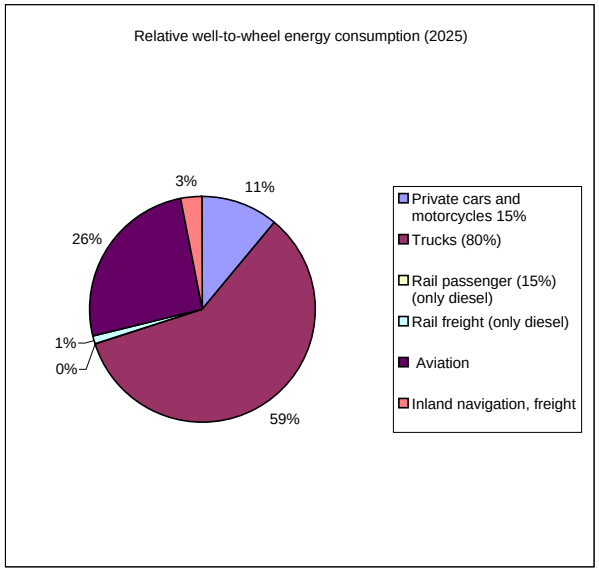

Baseline compared to target
1200000
1000000
800000
600000
400000
200000
0
Kt
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
Year
582219,4318
636887,3545
678482,3116
714229,5708
725295,0507
736948,9886
796410,7612
861356,9422
931922,5078
1008232,505
525861,2138
474958,4111
428982,9451
387457,8551
349952,3494
316077,3365
285481,3885
257847,0956
232887,7727
Total CO2 emm. in baseline (well-to-wheel)
Target

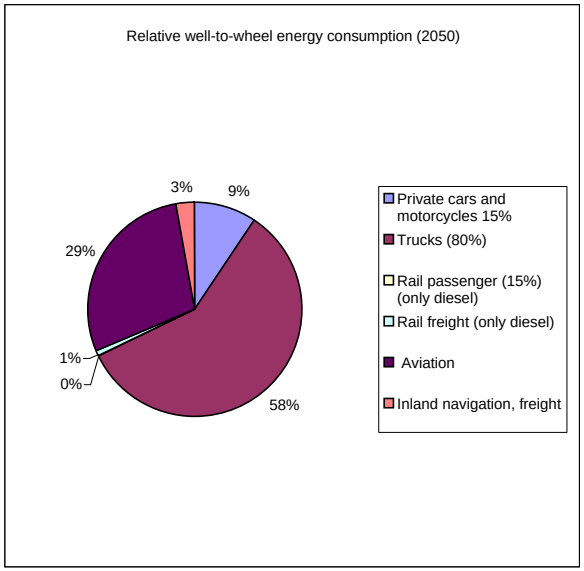


	2005	2015	2025	2035	2045	2050
Well-to-wheel energy consumption in LDT transport (TJ)	**7722207**	**9080674**	**9738978**	**10712970**	**12554255**	**13592419**
Private cars and motorcycles 15%	1082872	1060180	1082287	1098561	1215543	1278626
Trucks (80%)	4130898	5181986	5733940	6313667	7352062	7933648
Rail passenger (15%) (only diesel)	15446	13878	12160	12352	13153	13572
Rail freight (only diesel)	120270	101178	87546	88044	91949	93966
Aviation	2108179	2435127	2512666	2872240	3528699	3911214
Inland navigation, freight	264541	288325	310378	328107	352849	361394




Relative well-to-wheel energy consumption (2005)
3%
14%
27%
2%
0%
54%
Private cars and motorcycles 15%
Trucks (80%)
Rail passenger (15%) (only diesel)
Rail freight (only diesel)
Aviation
Inland navigation, freight


Relative well-to-wheel energy consumption (2025)
3%
11%
26%
1%
0%
59%
Private cars and motorcycles 15%
Trucks (80%)
Rail passenger (15%) (only diesel)
Rail freight (only diesel)
Aviation
Inland navigation, freight


Relative well-to-wheel energy consumption (2050)
3%
9%
29%
1%
0%
58%
Private cars and motorcycles 15%
Trucks (80%)
Rail passenger (15%) (only diesel)
Rail freight (only diesel)
Aviation
Inland navigation, freight