

RESPONDER

Linking SCP and Growth Debates

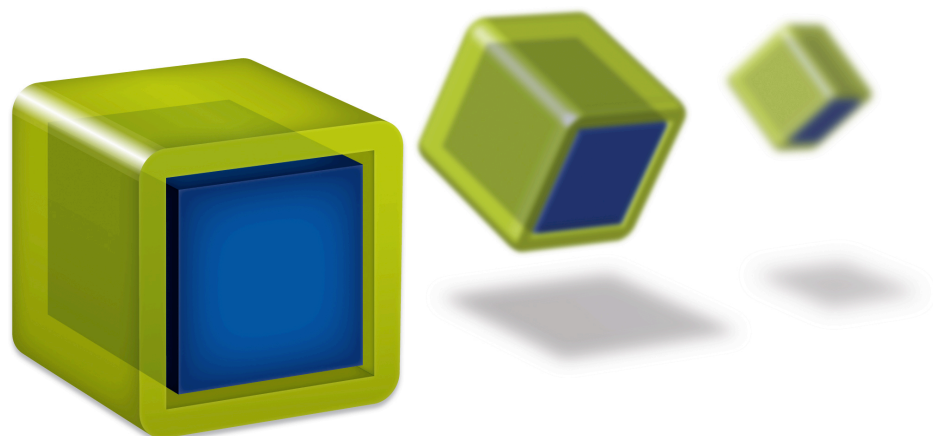
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Background paper on Sustainable Mobility and Growth

1st Multinational knowledge brokerage event on
Sustainable Mobility (Bratislava, 21-23 March 2012)

RESPONDER - linking **RE**search and **PO**licy making for managing the contradictions of
sustai**N**able consumption and **E**conomic **g**rowth

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1. Executive summary

This paper provides background material on the core issues of the RESPONDER project and the 1st Multinational Knowledge Brokerage Event on Sustainable Mobility in order to promote active participation and engagement in the debate.

The overall aim of RESPONDER is to promote sustainable consumption by exploring novel ways of knowledge brokerage that help to improve the management of potential political, social and economic contradictions with economic growth. The challenge is not just to bridge the gap between science and policy, but also to improve the mutual understanding between the “pro-growth community” and the “beyond-growth community”. RESPONDER aims to improve the mutual understanding and knowledge transfer between these groups by using participatory systems mapping as a core methodology. Knowledge brokerage means that the project will not conduct new research, but exploit existing research by new integrative modalities of linking research results to policy-making. This approach will be explored in a series of Multinational Knowledge Brokerage Events focused on five sectoral policy areas – food, housing, household electronics, mobility and private savings/debts.

This paper first briefly outlines some of the key messages presented in a selection of recent initiatives promoted by the UN, OECD, EU and individual EU Member States reflecting the desire to promote sustainable economic development and ensure that it does not jeopardise the well-being of the planet and of future generations. These initiatives generally acknowledge that technological solutions are unlikely to solve the sustainability challenge and that new policy frameworks, behavioural change and altered lifestyles will have to play major roles.

Sustainable transport and in a more complex way sustainable mobility encompasses a multiplicity of aspects, such as affordable, fairly operating and efficient transport modes supporting a competitive economy, as well as balanced regional development, in the same time limiting emissions and waste and renewable resources at or below their rates of generation, while minimising the impact on the use of land and the generation of noise.

The mobility sector and its modernisation as part of a resource efficient Europe is among the seven flagship initiatives of the Europe 2020 strategy. The overall goal of the European Union is a 1% yearly reduction (on average) in transport GHG emissions from the year 2012 (European Commission 2011d). Different policy instruments can be used to promote sustainability in the mobility sector.

However, approaches that integrate sustainability challenges including all three pillars of the sustainable development agenda (i.e., economic, social, and the environmental) are still hard to find. Material efficiency, social inclusion, traffic accidents and health, urban and regional planning, or a multimodal mobility approach are not linked to each other. Challenges and opportunities in sustainable mobility will be discussed at the the 1st Multinational Knowledge Brokerage Event on Sustainable Mobility.

In the systems mapping exercises that will be undertaken in the 1st MKBE we explore the links and contradictions between sustainable mobility and growth, focusing in three major questions:

- ***Which effect might increasing petrol prices have on the EU27 petrol consumption?***
- ***How does road construction influence transport volume and modal split?***
- ***Have the car scrapping premiums introduced in some European countries reduced the overall environmental impacts?***

In this mapping exercises during the workshop we will explore the interrelationships underlying these questions, revealing the different factors shaping the links between changing petrol prices in Europe and the social and environmental impacts in the EU 27 countries, we will map and analyse outcomes of the road construction on volume and modal split and look at the policy measures such as scrapping premium and their environmental impacts.

2. The RESPONDER project

The overall aim of RESPONDER is to promote sustainable consumption by exploring novel ways of knowledge brokerage that help to improve the management of potential political, social and economic contradictions with economic growth.

The challenge is not just to bridge the gap between science and policy, but also to improve the mutual understanding between the “pro-growth community” (i.e. economists and policy makers oriented towards growth as an overarching policy goal) and the “beyond-growth community” (i.e. scientists oriented towards the limits to growth debate and policy makers involved in sustainable development). RESPONDER aims to improve the mutual understanding and knowledge transfer between these groups by using participatory systems mapping as a core methodology. So-called system maps serve as the basis for systematising empirical findings, questioning different model assumptions, analysing the effects of different policy options and identifying new research questions. Knowledge brokerage means that the project will not conduct new research in this area, but exploit existing research by new integrative modalities of linking research results to policy-making. In synthesis, RESPONDER:

- Links the sustainable consumption and growth debates: its overall aim is to promote sustainable consumption by exploring novel ways of knowledge brokerage;
- Links four communities: research, policy, pro-growth, and beyond growth;
- Aims to improve mutual understanding and knowledge transfer between these groups by using participatory systems mapping, in a series of Multinational Knowledge Brokerage Events on five sectoral policy areas – food, housing, household electronics, mobility and private savings/debts.

3. Reconciling economic development and sustainability¹

A number of initiatives, at all levels of policymaking, reflect the desire to promote sustainable economic development and ensure that it does not jeopardise the well-being of the planet and of future generations. This section briefly outlines some of the key messages presented in a selection of recent initiatives promoted by the UN, OECD, EU and individual EU Member States. Not all of these proposals address the topic of sustainable consumption at great length. Nevertheless, most of them acknowledge that technological solutions are unlikely to solve the sustainability challenge and that behavioural change and altered lifestyles will have to play major roles.

3.1 UNEP Green Economy Initiative

Launched in late 2008, the UNEP-led Green Economy Initiative aims to provide the analysis and policy support for investing in green sectors and in greening environmentally unfriendly sectors. UNEP defines a green economy as one that results in “improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities” (UNEP, 2011:16). In short, a green economy values and invests in natural capital, being low carbon, resource efficient and socially inclusive. In the report *Towards a Green Economy “sustainable consumption”* is linked to increased resource efficiency in consumption patterns and the purchase of green goods and services. A case is made to invest two per cent of global GDP in greening ten key sectors of the global economy in order to shift development and unleash public and private capital flows onto a low-carbon, resource-efficient path. The Green Economy report shows how a green economy presents a new engine of growth; how it generates new decent jobs; how it can reduce persistent poverty across a range of important sectors; and how this shift can be achieved. The report seeks to motivate policy makers to create the enabling conditions for increased investments in a transition to a green economy. UNEP’s concept of a green economy does not replace sustainable development; moving towards green economies should unleash potentials to achieve sustainable development and poverty eradication on a scale and at a speed not seen before.

3.2 OECD Green Growth Strategy

At the OECD Ministerial Council Meeting in June 2009, Ministers acknowledged that “green” and “growth” policies can go hand-in-hand, and asked the OECD to develop a Green Growth Strategy that brings together economic, environmental, social, technological, and development dimensions into a comprehensive framework. The publications “Towards Green Growth” and “Towards Green Growth – Monitoring Progress: OECD Indicators”, published in May 2011, provide an operational and flexible framework for governments in developed and developing countries on how economic growth and environmental protection can be achieved. The overarching goal is to establish incentives or institutions that foster innovation, investment and competition that can give rise to new sources of economic growth that is consistent with resilient ecosystems – with the ultimate goal to increase well-being. The strategy explicitly calls for new production and consumption modes in order to sustain and raise living standards. Equity concerns are acknowledged but it is recommended to tackle them in separate initiatives together

¹ This section draws extensively from Pirgmaier, E.; Dobernig, K.; Polzin, C.; Scholl, G.; Sedlacko, M. (2011). 1st European Dialogue on Sustainable Consumption and Economic Growth – Background Paper. 19-21 October 2011, Berlin.

with other social issues of sustainable development agenda. Overall, green growth is considered as a subset of sustainable development, rather than as a replacement.

3.3 Europe 2020

Europe 2020 has been launched in 2010 as a successor agenda of the Lisbon strategy. Proposed by the European Commission and endorsed by the European Council as a ten-year strategy of smart, sustainable and inclusive growth, it follows a consistent approach to converge the wide range of economic, social and environmental policies the EU is striving for. Five headline targets have been agreed for the whole EU for 2020 – regarding employment, R&D/innovation, climate change and energy, education and poverty/social exclusion. Similarly to the Lisbon strategy, the new strategy highlights the need to decouple economic growth from the use of natural resources, thus achieving “sustainable growth”. This reconciliation is tackled under the Flagship initiative “Resource-efficient Europe”. Equity issues are addressed by the Flagship initiative “European platform against poverty”, but not explicitly targeted. Europe 2020 and the flagship initiatives serve as the umbrella of the European Sustainable Consumption and Production Policies. The key European Union’ documents for reaching the EU 2020 targets was adopted in the September 2011 under the name the Roadmap to a Resource Efficient Europe. The document calls for a modern, resource efficient mobility system, serving both passengers and freight and which can contribute significantly to competitiveness and sustainability.

3.4 Degrowth movement

The degrowth movement is capturing part of the growth-sceptical debate. The economist Nicholas Georgescu-Roegen is considered as the creator of the concept of degrowth already in the 70s, although to his view degrowth was not conceived as a voluntary societal idea, as put forward by the degrowth movement since 2001. Instead, it was considered an unavoidable necessity for a real durable development of humanity within the biosphere. The degrowth movement has been experiencing a popular upswing in recent years and is particularly active in France (“décroissance”), Spain (“decrecimiento”) and Italy (“decescita”). It comprises scientists as well as activists, who advocate an equitable down-scaling of production and consumption in order to increase human wellbeing and enhance ecological conditions at the local and global level, in the short and long term (Schneider et al., 2010). Degrowth ideas are based on an assumption that reducing “overconsumption”, as a root cause of today’s environmental and many social problems, does not require individual martyring and a decrease in well-being. Well-being can rather be achieved through non-consumptive means, such as work sharing, less consumption or more time for friends, family, culture and the community. The first international Degrowth Conference took place in April 2008 in Paris, the second one in March 2010 in Barcelona, and the third one is planned for early 2012 in Venice.

3.5 German Study Commission on Growth, Wellbeing and Quality of Life

The Study Commission of the German Parliament on “Growth, Prosperity, Quality of Life – Toward Sustainable Development and Social Progress in the Social Market Economy” is expected to determine the importance of economic growth in the economy and society with the aim of developing a holistic well-being and progress indicator. It also aims to investigate the possibilities and limits of decoupling growth,

resource use and technological progress. Final results are expected by the end of the legislative period in 2013. The study commission consists of 34 members, including 17 members of parliament and the same number of external experts, appointed by the political groups according to the majority.

3.6 Growth in Transition

“Growth in Transition” is an Austrian initiative, which brings forward the question on what kind of growth is desirable for the future and which goals are targeted with it. Formed in 2008 by the Austrian Ministry of Agriculture, Forestry, Environment and Water Management as a stakeholder dialogue, the initiative intends to trigger a dialogue among institutions and people about how we can shape a transformation process towards sustainability. It also aims at contributing to current EU and international processes and at informing the Austrian public. The initiative covers different institutions that organise activities focusing on the same core issue but from different angles. It currently consists of 15 partner organisations – seven Austrian ministries, three Austrian provinces, Social Partners, companies, Oesterreichische Nationalbank and organisations from the civil society. Sustainable consumption has played an explicit role in an international conference with more than 550 participants held in January 2010. Findings exist from a workshop series 2009/2010, the conference and current work on a Policy-Science-Stakeholder Dialogue.

3.7 Policy initiatives to better measure progress

3.7.1 Beyond GDP

In 2007, the European Commission initiated “Beyond GDP” – a process that led to the adoption of a communication in 2009 with a concrete roadmap for developing new environmental and social indicators to measure the prosperity and well-being beyond GDP. The roadmap suggests five key actions to improve indicators of progress in ways that provide an improved basis for public discussion and policy-making: complementing GDP with environmental and social indicators; near real-time information for decision-making; more accurate reporting on distribution and inequalities; developing a European Sustainable Development Scoreboard; and extending National Accounts to environmental and social issues.

3.7.2 Commission on the Measurement of Economic Performance and Social Progress

French President Nicolas Sarkozy set up this high-level Commission in 2008, chaired by Joseph Stiglitz, recipient of the 2001 Nobel Prize in Economics. The Commission’s final report was published in September 2009 and contains chapters on classical GDP issues (e.g. addressing the importance of improving existing measures of economic performance before going beyond GDP); quality of Life (e.g. emphasising the importance to complement measures of market activity with measures of people’s wellbeing); and Sustainable Development and Environment (e.g. following the logic of a “wealth” or “stock-based” approach to capture sustainability). The report provides a general overview of the state-of-the art in the respective areas and comes up with 12 key recommendations.

3.7.3 OECD’s Project on Measuring Progress of Societies and the Better Life Initiative

The OECD initiated a global project on “Measuring the Progress of Societies” in 2004 to foster the development of key economic, social and environmental indicators in order to provide a comprehensive picture of how the well-being of a society is evolving. The project aims to encourage the use of indicator sets to inform and promote evidence-based decision-making, within and across the public, private and

citizen sectors. The Better Life Initiative, launched in 2011, follows a similar objective of understanding what drives well-being of people and nations and what needs to be done to achieve greater progress for all.

4. Sustainable mobility²

4.1 Definition of sustainable mobility

There is no commonly agreed definition of ‘Sustainable Mobility’. At the European level the terms ‘sustainable mobility’, ‘sustainable transport’ and ‘sustainable transport system’ are used by, e.g., the European Commission, the European Parliament, and Council of Ministers. Although these terms are sometimes used synonymously, there is a substantial and policy-relevant difference between them. Generally speaking, mobility is a broader concept than transport. Whereas the former only includes transport activities or actual movement and the related (environmental) impacts, the latter additionally includes the opportunities and barriers to move by different means of transport. Hence, mobility also refers to the spatial, economic, and social context of movement (Schade & Rothengatter, 2011; Gudmundsson, 2003).

In its Sustainable Mobility Project (SMP) the World Business Council for Sustainable Development (WBCSD) offered a definition incorporating this broader idea of sustainable mobility: “Sustainable Mobility is the ability to meet the needs of society to move freely, gain access, communicate, trade, and establish relationships without sacrificing other essential human or ecological values, today or in the future” (WBCSD, 2004). This brief characterization provides a broad and encompassing definition of sustainable mobility including all three pillars of the sustainable development agenda, adding to it the dimension of accessibility and the potential to move. The definition adopted by the European ministers of transport is even more concrete and comprehensive (Council for Transport and Communications, 2001). It states that a sustainable transport system is one that

- allows the basic access and development needs of individuals, companies and societies to be met safely and in a manner consistent with human and ecosystem health, and promotes equity within and between successive generations;
- is affordable, operates fairly and efficiently, offers choice of transport mode, and supports a competitive economy, as well as balanced regional development;
- limits emissions and waste within the planet's ability to absorb them, uses renewable resources at or below their rates of generation, and, uses nonrenewable resources at or below the rates of development of renewable substitutes while minimising the impact on the use of land and the generation of noise.

The definition itself does not deliver any specific guidance on how to obtain a sustainable transport system or sustainable mobility; rather it provides the basic principles for the development of political strategies. Taking the concept of ‘mobility’ into account, political strategies and planning initiatives derived from these principles should not only be about the modes of transportation, nor only about transportation. Instead they should be multisectorial, inclusive approaches encompassing all the relevant dimensions to the transport system. Mobility in this understanding is not merely technical issue, it is

² This chapter is partly taken from the “CORPUS Discussion Paper 1 on Sustainable Mobility” (Rubik et al., 2011).

part of the complex, multi-sectorial interactions between economic, environmental and social aspects of the development.

4.2 Sustainable consumption and its features in the mobility domain

A critical issue for sustainable mobility is the inconsistency and incoherence between environmental awareness and acknowledgement of the impact of own transport activities. Only a little less than 50% of people believe, that their travel behaviour has an influence on climate change (King et al., 2009, p.17). With respect to mobility, even the usually prevailing willingness to change is diminished as compared to other consumption fields: According to King et al. (2009, p.18), people are less willing to reduce their CO₂ transport emissions than their CO₂ domestic emissions. There is a complex system of barriers built from habits, routines, information deficits, lack of alternatives and consumer attitudes that prevents people from switching to more sustainable mobility.

In the EU, the overall development in the domain of mobility is showing negative trends regarding its absolute environmental impact. Emissions from the transport represent serious problem and one of the key challenges for the future of the European environment (EEA 2010a). The following developments and trends of consumption patterns in the mobility domain have been observed in the EU:

- Within the last decade, the average specific CO₂ emissions of new passenger cars registered in the European Union decreased from 172.2 gCO₂/km in 2000 to 145.7 gCO₂/km in 2009 (European Commission, 2010a, p.3). At the same time the average power of new registered cars in Western Europe³ increased from 62 kW in 1990 to 87 kW in 2007. Furthermore, the share of off-road passenger cars increased from 2.9% in 1997 to 9.9% in 2007 (ACEA, 2010, p.1). Hence, whereas the production side shows technological improvements, consumption patterns have shown rather negative trends from an environmental perspective.
- Personal transportation in the EU consists primarily of motorized individual transport (53 % of personal kilometres travelled), followed by public transport (22 %), while non-motorized individual transport (walking and cycling) takes the last place with 20% (European Commission, 2011a, p.5). There are large differences among EU Member States as, for example non-motorized individual transport for daily activities, ranges from 34 % in the Netherlands down to 7 % in Luxembourg or 3 % in Cyprus (European Commission, 2011a, p.8).
- Motorized private transport is the main transport mode and the number of cars is increasing in Europe. In 2008, every 1,000 Europeans owned 470 cars (European Commission, 2011c, p.119).
- Evidence shows that, in general, growth of GDP and increase of household income leads to higher spending on transportation and, hence, supports the use of faster modes of transportation. This can clearly be seen in the growth of air travel as the main driver for growth within EU with a 48 % increase from 1997 to 2007 (EEA, 2010b, p.12).
- When considering the environmental impact of transport activities holiday mobility is one of the most critical issues due to the total number of kilometres travelled and modal split. Holiday related

³ EU 15 plus EFTA countries.

travel accounts for the largest total distance travelled and air transport makes out 31 % of total distances travelled (Peeters et al., 2004).

4.3 Sustainability issues in the mobility system

Mobility is one of the private consumption areas that have the largest impact on the environment within the European Union. In the following, some of the major environmental, social and economic impacts of current mobility patterns are briefly discussed.

4.3.1 Selected environmental issues

The main environmental impacts linked to mobility arise during the use of different means of transport, that is, in the consumption stage. Several life cycle assessment studies have dealt with this topic: With regard to cars in the EU-25 in 2004, Nemry et al. (2008) identified that the use of a passenger car (i.e. fuel consumption) makes out the biggest share of the car total life cycle environmental impact⁴.

GHG emissions: In 2008, the transport sector consumed 32% of the EU-27 final energy consumption (Eurostat, 2011, p.48). The mobility system is almost completely dependent on fossil fuels. Accordingly, transport covers around 19.5% of the EU-27's total GHG emissions in 2008 – without including international aviation. Within the transport category, road transportation alone represents around 94% of all transport emissions in the EU-27. While total EU-27 GHG emissions during the period 1990–2008 decreased GHG emissions in the transport sector increased during the same period⁵. Whereas emissions from rail decreased all others modes of transportation increased their GHG emissions. Emissions from aviation have grown the fastest and according to the observed trend, aviation's emissions should have doubled in 2010 compared to 1990.

Particulate matters (PM): Road transport is the second largest contributor to pollutants forming PM. In 2008, the share of transport in PM₁₀ and PM_{2.5} emissions⁶ was 15.6% and 17.8% respectively⁷. Many scientific studies have linked breathing PM to a series of significant health problems, including aggravated asthma, increases in respiratory symptoms like coughing and difficult or painful breathing, chronic bronchitis, decreased lung function, and premature death. Although emissions of primary PM₁₀ are expected to decrease, especially within many urban areas, concentrations will still be above EU limit values for PM₁₀ and represent an especially high risk for human health.

Noise: Among different human activities transport noise has the highest health impact. Road traffic is the dominant source of exposure to transport noise. About 59.1 million people in the EU-27⁸ are ex-

⁴ This has been confirmed by other studies, e.g. Elgahli et al. (2004), Volkswagen (2008). Avery et al. (2009) give a broad overview on LCA-studies. Similar results have been prepared for other means of transport, see e.g. von Rozycki et al. (2003) for trains.

⁵ Source: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Transport_energy_consumption_and_emissions

⁶ PM₁₀ and PM_{2.5} are tiny subdivisions of solid matter suspended in a gas or liquid. The notation PM₁₀ is used to describe particles of 10 micrometers (µm) or less and PM_{2.5} represents particles less than 2.5 micrometers in aerodynamic diameter (<http://www.epa.gov/OCEPAt/terms/pterm.html>).

⁷ Source: <http://www.eea.europa.eu/data-and-maps/figures/sector-contributions-of-emissions-of-1>

⁸ Without Malta.

posed to road traffic noise above 55 L_{den} dB⁹, 12.5 million people to railway noise and 6.9 million to airport noise levels (EEA, 2010b, p.21). Noise is a particular problem in an urban environment, where about 75% of Europe's population live¹⁰. Noise can cause a number of short- and long-term health problems.

Land-use and eco-systems: Transport infrastructures contribute to landscape fragmentation, as well as fragmentation and destruction of habitats and of ecosystems. Transport infrastructure consumes about 25-30% of land in urban areas and almost 10% in rural areas within OECD countries (OECD, 2006, p.49). This is caused mainly by roads which required 93% of total land area used for transport in the EU-15. Railways are responsible for 4% of land take and airports for less than 1% (EEA, 2004, p.26).

Material use: Sources indicate that personal mobility consumes about 15% of material use activated by national consumption (EEA, 2010a, p.38).

Spatial planning: (Or) lack of spatial planning, trends of large scale housing projects outside of the cities depending on car commuting, centralised infrastructure (i.e., shopping malls replacing local shops) radially increase traffic volume.

4.3.2 Social aspects

Social inclusion and exclusion: Mobility has become a basic necessity through centralization of services such as schools and medical facilities, but also through supermarket and shopping mall relocation to the edge of urban areas. The growth in this basic demand has not always been matched with an inclusive¹¹ transport system. Public transport has not always kept pace with the aforementioned developments and car ownership is not affordable for a significant number of people with low income in many European countries (European Federation for Transport and Environment, 2003).

Low income: 20% of the European population with the lowest income only spend 8.1%, whereas the 20% with the highest income spent 14.4% of their income on transport (EEA, 2011). Hence, according to the time-money-relation (Schäfer, 2006) people with low incomes will either have to choose slower transportation modes or travel less. Either way they will be exposed to social exclusion.

Growing inequalities are also reflected in transport modes. Wealthier passengers have tendency to use cars.

Accidents: Mortality from road accidents is responsible for the biggest share of all persons killed, namely 38,875 deaths in the EU in 2008. However, compared to 1990, this number was almost half (European Commission, 2010b, p.177f). Mortality from road accidents is the leading cause of death among children and young people, and especially young men, in many countries (European Federation for Transport and Environment, 2003, p.1).

⁹ L_{den} is a long-term noise level averaged over one year and based upon an average day within that year. As such, it combines the L_{day} , $L_{evening}$ and L_{night} levels. Within L_{den} , the $L_{evening}$ and L_{night} components are weighted by adding 5 decibels (dB) and 10 dB respectively.

¹⁰ Source: <http://www.eea.europa.eu/themes/noise>

¹¹ An inclusive transport system is designed in a way, that all social groups can satisfy their mobility need at least to an extend that does not exclude them from any social activity and allows them to fulfil all other basic needs, such as going to health services, shopping, etc.

4.3.3 Economic aspects

Private households within the EU-27 spent 945 billion Euros (i.e. 13.4% of their total consumption) on transport-related items in 2008. This percentage has not changed significantly over many years (same share for 1995) (European Commission, 2010b, p.95). This means that transport expenditure is increasing on one hand, but is in line with the total increase of household consumption. About half was used for the operation of personal transport equipment (492 billion Euros), 279 billion Euros for the purchase of vehicles and 174 billion Euros for the purchase of transport services. The shares for transport expenditure fluctuate between 7.6% in Slovakia and 19.2 % in the case of Luxembourg, but, in general, especially new Member States have higher shares of transport expenditures (European Commission, 2010b, p.102).

Internalization of the external costs affiliated with different transport modes is the key economic challenge. Car transportation has an advantage towards train and other modes of transport because external social, environmental and economic impacts are not fully internalised in the price of car transportation.

4.4 Enhancing sustainability: current approaches

The mobility sector and its modernisation as part of a resource efficient Europe is among the seven flagship initiatives of the Europe 2020 strategy (European Commission, 2010c). The mobility system is also dealt with in the EU's sustainable development strategy (Council of the European Union, 2006). Recently, the Commission published its new White Paper for the transport area (European Commission, 2011b) announcing 30 initiatives foreseen in the next couple of years. The overall goal of the European Union is a 1% yearly reduction (on average) in transport GHG emissions from the year 2012 (European Commission, 2011d.).

These strategies and concepts highlight the attention of policy makers to greening the mobility domain. However, approaches that integrate sustainability challenges including all three pillars of the sustainable development agenda are still hard to find. Material efficiency, social inclusion, traffic accidents and health, urban and regional planning, or a multimodal mobility approach are not linked to each other. Recently implemented European policy tools pursue a more area specific approach. Examples are the target of a 10% share of renewables used in transport ("biofuels")¹², the regulation on CO₂ standards for new passenger cars or the inclusion of aviation in the EU emission trading scheme. Other approaches, such as a strategy for the internalisation of external costs or the charging of heavy goods vehicles are under discussion.

¹² It is worth noting the recent discussion on adding or substituting biofuels for oil fuels. This has been prescribed by a directive of the EU. This change is relatively easy to implement because only minor changes must be made. However, the environmental benefits of this strategy are considered very controversial and might be dubious (see e.g. Börjesson and Tufvesson, 2011; Boywer, 2010; Lange, 2011; Menichetti and Otto, 2009; Zah et al., 2007).

Furthermore, a lot of effort has been dedicated to improving the *efficiencies* of transport modes, e.g. by technological progress and by improving infrastructure. The support of modal shift is relevant, but it often seems that this deals more with a *relative* alteration, instead of an *absolute* shift among modes meaning that perhaps shares among the different modes might change toward public transport, cycling and walking, but that the total transport demand is continuously growing. Of still minor importance is the *reduction* approach. Embedding it in a broader policy concept is still an open task. The reduction target is, if at all, the most far-reaching objective of mobility policies. It is hard to address, as policy-makers are reluctant to intervene in people's lifestyles. It is also difficult to implement, as it requires comprehensive tool boxes and rebound effects may offset gained improvements.



5. Exploring links and contradictions between sustainable mobility and growth

5.1 Which effect might increasing fuel prices have on the EU27 car fuel consumption?

Between 1995 and 2006, the number of cars in the EU-27 increased by 22 %, or 52 million cars (EEA 2010a: 32). The effect of increasing fuel prices on car fuel consumption is rather complex and complicated phenomenon. For instance, in the USA in the 1970s, a 10% rise in the cost of car fuel would lead to about a three percent decline in the amount of fuel consumed, while in the early 2000s, car fuel prices would have to rise about 60 percent to provoke a similar decline in car fuel consumption (Espey 1998, Dahl and Sterner 1991, Hughes et al 2011). Behavioural and structural factors over the past several decades have changed the responsiveness (e.g., changing land-use patterns, family patterns, per capita disposable income, status consumption, as well as a decrease in the availability of alternative modes).

Petrol prices consist of different elements, especially price calculations by manufacturers of petrol, but also economic instruments (e.g. mineral oil tax, value-added tax) are responsible for the sale price at the petrol station. Fuel taxes in Germany are €0.4704 per litre for ultra-low sulphur Diesel and €0.6545 per litre for conventional unleaded petrol, plus Value Added Tax (19%) on the fuel itself and the Fuel Tax. Almost 55% of the total cost paid at a petrol station in Czech Republic goes to the state budget in the form of different taxes and charges.

There is strong interest in reducing fossil fuel consumption in the EU (EEA 2010, European Commission 2011d). We have seen several trends in the EU recently. For instance, pressure to increase share of bio-fuels in the total fuel consumption. There is a renewed interest in price-based policies such as petrol or carbon taxes.

This interest is propelled by various reasons, such as dependency on oil import, transport related greenhouse gas emissions as well as the effect of increasing fuel prices on the EU competitiveness. In the same time, petrol taxes represent an important source of budget revenues. Combination of external factors influencing cost of petrol and internal factors (i.e., taxation) has its outcome. Petrol prices have been constantly increasing and the forecasts are, that they will increase further (OECD 2008, IEA2011).

Petrol price has been constantly increasing and there is no sign that this trend will be in any way reversed. The question arising and selected for this exercise is, **which effect might increasing petrol prices have on the EU27 petrol consumption?**

The “classical” expectation is a reduction of the petrol consumption. Is it so, and what are the trends? In the same time, petrol and its consumption is directly linked to car production and infrastructure centered around the life style based on car possession. We will attempt to reveal the different factors shaping the links and leading to various positive and negative consequences.

5.2 How does road construction influence transport volume and modal split?

According to the European Environmental Agency (EEA), passenger transport in the EU 27 continued to grow and the volume of transportation of passengers is projected to increase between 2005 and 2030 at a rate of approx. 1.4% per year. Car journeys remained the dominant mode of transport, accounting for 72 % of all passenger kilometres in the EU-27 (EEA 2010a: 34). Increasing share of road transport compared with other transport modes is the most serious source of the air pollution in many European countries.

Availability, accessibility and quality of the road infrastructure play an important role in influencing transport volume and modal split. In general, the transportation choice is affected by at least following variables: the cost and quality of transport, comfort, personal preferences, reliability, safety, and time. Effect of road construction on these variables may be various and change over the time.

The current transport paradigm is, the time spent for travelling must be reduced. Travel time is considered to be 'wasted time' and a disutility. This means that travel time needs to be minimised, speed needs to be increased. The new roads construction and the improvement of existing roads (e.g. more lanes) is the key strategy, which should result in increase of speed.

However, in spite of more and more road construction the time travelled remains constant ("Brewers law"). Recent study of Gilles Duranton and Matthew Turner indicates, that its volume increases and that there may be a "fundamental law of road congestion." Analyzing data from the U.S. Highway Performance and Monitoring System for 1983, 1993 and 2003, as well as information on population, employment, geography, transit, and political factors they determined that the number of vehicle-kilometres travelled actually increases in direct proportion to the available lane-kilometres of roadways (Duranton and Turner 2011). These studies and evidence indicate, that building new roads and widening existing ones only results in additional traffic that continues to rise until peak congestion returns to the previous level.

Road transport was the largest emitter of nitrogen oxides and the second largest contributor of pollutants forming particulate matter in 2007. (EEA2010a). Land use, increasing noise, decreasing safety and other factors are also coming into the picture. Road infrastructure in a short run improves the cost and quality of transport, reliability, safety, and time. Yet the usual experience is that in the longer run these effects decrease and affiliated social and environmental externalities impose burden on the society. On the other hand, the road infrastructure is often seen as the precondition for economic development and has its strong advocacy in many governments.

The key concept in sustainable mobility perspective is to change modal split in passenger transport with the aim of reducing environmental externalities, social impacts, congestion, accidents and increasing well-being. Does road construction; widening and improving connections contribute to these aims? **How does road construction actually influence transport volume and modal split?**

In the system mapping exercise during the workshop we attempt to reveal the different factors shaping the links between road construction, transport volume and modal split within the EU 27 Member States and the social and environmental impacts at different scales.

5.3 Have the car scrapping premiums introduced in some European countries reduced the environmental impacts of the car fleet?

Car scrapping schemes are no new policy invention – comparable policies were introduced in the 1990s in several European countries as well as in several US states and Canada -, but the instrument has experienced a major boost as a response to the current economic crises. Since the end of 2008, car scrapping schemes have been enacted in 13 EU Member States allowing for a direct financial benefit to consumers for scrapping their old vehicle provided that a newer vehicle is acquired (IHS 2010, 9; European Commission 2009a).

Throughout the EU, the general rationale for employing the schemes has been as a short term solution to the downturn in the automotive industry as a consequence of the economic crisis. Hence, the rationale for the car scrapping schemes in the EU has clearly been socio-economic. Moreover, fleet renewal instruments like car scrapping schemes also have a potential to affect class distribution towards lighter vehicles as well as replace older with new vehicles with more fuel efficient and cleaner technology (Wee et al. 2011; OECD 2011). Hence, car scrapping schemes may also be introduced as an environmental, climate as well as health protection policy instrument. Notwithstanding the potential environmental impacts of such schemes, we can observe significant variations in the environmental impacts of the schemes across the EU.

Out of the 13 schemes a total of six schemes included conditional environmental criteria to be eligible for the financial incentive. These are France, Italy, Portugal, Spain, Luxembourg and Cyprus. The environmental criteria included in the six schemes were all related to fuel consumption. Only the Italian scheme also included criteria related to the type of fuel (i.e. compressed natural gas (CNG), electricity, hydrogen or liquefied petroleum gas (LPG)).

The Greek, the Austrian and the German schemes included the EURO 4 and EURO 5 standards as a condition for receiving the subsidy; however, these standards were in fact already mandatory at the time. Hence, we don't consider these criteria being relevant.

Two key parameters determine the environmental impacts of fleet renewal initiatives. First, the effects in terms of shift of classes (towards smaller cars), diffusion of new technology (like electric vehicles), fuel consumption and the level of emissions. Second, the actual impact of the fleet renewal schemes also should be weighted with the distances travelled by the age and class of the vehicle replaced as well as with the projected travel distances of the new vehicles. Cars are generally driven less the older they are. Hence, accelerating the renewal of the car fleet will generally affect the overall "lifetime" VKT by both vehicles compared to a business as usual scenario. Accordingly, the total distance travelled by the combination of the two cars is likely to increase and as a result the environmental benefits from scrapping-scheme-induced rejuvenation are likely to be similarly weaker than expected (OECD 2011; IHS 2010).

In the mapping exercise we will discuss the different factors shaping the links between the car scrapping schemes and the resulting environmental impacts in terms of fuel consumption and emissions.

Outline of the workshop

The first **Multinational Knowledge Brokerage Event on Sustainable Mobility** takes place on 21- 23 March 2012 at the Old Building of Parliament, Bratislava, Slovak Republic. On **Thursday, 22 March**, following the welcome and introductory address by **Edita Nemcová** (Head of the Institute for Forecasting Studies/Slovak Academy of Sciences), the workshop will be opened by the first panel of experts. The title is **Setting the stage for sustainable mobility: Economic (de)growth, social polarization and environmental challenges**.

Key note presentations of **Maroš Finka** (Slovak University of Technology) and **Michael Cahill** (University of Brighton, UK) are planned. The presentations will set the scene for the core questions that RESPONDER deals with. In particular, prof. Finka will speak about mobility in the context of spatial planning and complex understandings of the problem. Michael Cahill will address social and environmental context of the transport issues. Invited experts will then together with moderator **Tatiana Kluvánková – Oravská** (Institute for Forecasting Studies/Slovak Academy of Sciences) discuss with the audience. **Questions and discussion on the plenary presentations** will be conducted first in groups and then in the plenary.

In the next part, all participants will get the chance to debate some of the presented issues in the course of a **poster walk**. The poster walk will provide informal space for face-to-face discussions and debates about different aspects of the sustainable mobility problems and present progressive approaches.

Following lunch break, **Jürgen Perschon**, head of the European Institute for Sustainable Transport (EURIST) present **Sustainable urban transport planning approaches** and based on the practical examples discuss key challenges and opportunities in switch from current patterns into more sustainable ones. After the presentation, the space will be open for questions and discussion on the two plenary presentations.

The remaining of Thursday afternoon is dedicated to the method RESPONDER uses for exchanging knowledge and fostering mutual understanding – participatory systems mapping. After a brief introduction to the method by **André Martinuzzi** (RIMAS WU, Austria), participants will be divided into three thematic working groups jointly construct and debate system maps one of three policy questions described in section 5. System mapping exercises will be facilitated by **André Martinuzzi**, **Frieder Rubik** (IOEW, Germany) and **Gerald Berger** (Vienna University of Economics and Business/RIMAS). **Richard Filčák** (Institute for Forecasting Studies/Slovak Academy of Sciences) will wrap up Day 1 and give an outlook of the next day.

On **Friday, 24 March**, after a presentation of interim outcomes by **Tatiana Kluvánková – Oravská**, we move to the second planned panel focusing on **Exploring controversies among growth, consumption and the transport --- How can we reshape trends and policies for sustainable mobility?** **Klara Tothova**, United Nations Development Programme and **Jutta Deffner** from Institute for Social - Ecological Research Germany will present examples of sustainable approaches. With moderator **Richard Filčák** and the audience we then seek to discuss problems and opportunities in sustainable mobility.

Following a period for questions and discussion, a second session on participatory systems mapping will take place, in which the maps from Day 1 will be discussed with members of other groups and finalized. Subsequently, the event facilitator, will introduce a **fishbowl discussion on policy conclusions and research needs**. This activity precedes the final address by the RESPONDER project coordinator, **André Martinuzzi**, who will wrap-up the debate and give an outlook on upcoming events and activities planned in the project. The workshop will also provide plenty of opportunities for informal discussions and social interaction.

On **Wednesday, 21 March**, a **welcome reception** is scheduled at **wine-house** at Vysoka Street in Bratislava center. On **Thursday, 22 March** a **dinner** will be hosted at **Bakchus Restaurant**.

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