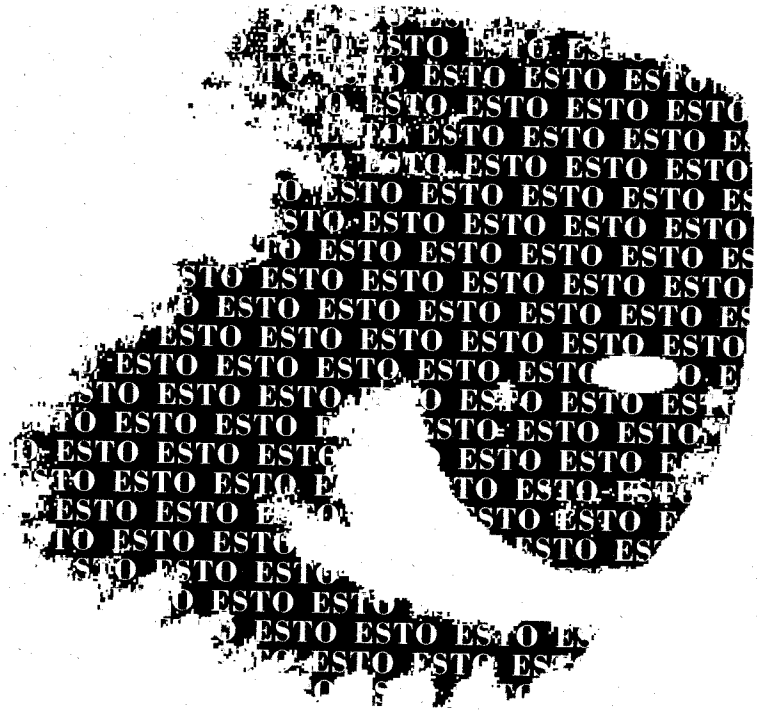
November/2003

79

ISSN: 1025-9384

The IPTS REPORT

EDITED BY THE INSTITUTE FOR PROSPECTIVE TECHNOLOGICAL STUDIES (IPTS)
AND ISSUED IN COOPERATION WITH THE EUROPEAN S&T OBSERVATORY NETWORK



CEE: XV/18

EUROPEAN COMMISSION
DIRECTORATE-GENERAL
Joint Research Centre

ENGLISH VERSION

THE IPTS REPORT

79

NOVEMBER 2003

EDITED BY THE INSTITUTE FOR PROSPECTIVE TECHNOLOGICAL STUDIES (IPTS)
And issued in Cooperation with
the European S&T Observatory Network

PUBLISHED BY THE EUROPEAN COMMISSION
Joint Research Centre
ISSN: 1025-9384
Catalogue Number LF-AA-03-079-EN-C
DEPOT LEGAL: SE-1937-95

DIRECTOR
Per Sørup

EXECUTIVE EDITOR
Dimitris Kyriakou

EDITORIAL BOARD
B. Clements, C. Fahrenkrog, J. Gavigan, M. González, H. Hernández, D. Kyriakou, I. Maghiros (Production Manager), A. Soria

PRODUCTION
CINDOC-CSIC/BGS

PRINT
Graesal

TRANSLATION
CINDOC-CSIC/BGS

THE IPTS REPORT
is published in the first week of every month, except for the months of January and August. It is edited in English and is currently available in four languages: English, French, German and Spanish.

SUBSCRIPTIONS
For a subscription to The IPTS Report, or to amend an existing subscription, please write with full details to:
The IPTS Report Secretariat
IPTS, JRC Sevilla
Edificio Expo
C/ Inca Garcilaso, s/n
E-41092 Sevilla, Spain
Tel: +34-95-448 82 52
Fax: +34-95-448 82 93
E-mail: ipts_secr@jrc.es
Web address: www.jrc.es/iptsreport/subscribe.html

CONTENTS

literacy obfuscates the need for science to review its own ways and how they may perpetuate the gap. Suffice it to mention here the time-honoured practice whereby a key task for all scientific disciplines is to create its own jargon, differentiating/delineating it from related disciplines, and (although perhaps inadvertently) making it largely impenetrable to outsiders, including other scientists.

Moreover the public and by extension the policy-maker craves certainty, answers which are definitive, not conditional on other parameters, especially when the underlying question involves risks/threats to health, security, well-being. It is indicative that scientists are often caricatured/vilified for beginning their responses with the usually entirely appropriate: "It depends...". The language of probabilities, as mentioned above, is neither easily intelligible, nor soothing, and not even really informative for much of the public. Tongue-in-cheek one can say that whereas science has moved and operates comfortably in a quantum universe, the public does not want to let go of the relative certainty of a Newtonian world.

The above come on top of evident differences in scientific and political priorities, such as divergent timetables for providing answers/solutions to questions, which make the interaction of science and policymaking difficult. There are ways to deal with the above but they deserve their own space and will be relegated to a future editorial.

Note

1. Daniel Yankelovich, Issues in Science and Technology online, Summer 2003, **http://www.nap.edu/issues/**

Contact

Dimitris Kyriakou, IPTS
Tel.: +34 95 448 82 98, fax: +34 95 448 83 39, e-mail: **dimitris.kyriakou@jrc.es**

logy as well as the retooling of factories to produce diesel engines in larger volumes would necessarily have had to start several years earlier. Therefore one can safely assume that the potential of the technology had already been recognized by industry.

The voluntary commitment

On February 5, 1999, the European Automobile Manufactures Association (ACEA) signed a voluntary commitment with the European Commission (EC) on reducing the average CO_2 emissions from new cars. The EC's aim during negotiations had been a target of 120g CO_2/km for all cars sold annually by 2005, and 2010 at the latest, but in the end a target of 140g CO_2/km in 2008 was agreed upon, with an intermediate target of 165-170g CO_2/km for 2003. The improvements should be reached *"mainly by technological developments and market changes linked to these developments"* (OJ 1999), and *"the Commission intends to present a legislative proposal on CO_2 emissions from passenger cars, should ACEA fail to achieve the CO_2 emission objective for 2008"* (OJ 1999). This last sentence is a statement indicating that there will be no need for legislation as long as the objective can be achieved by the measure taken. Equivalent commitments were signed with the Korean and Japanese automakers one year later (OJ 2000)[2].

The commitments include provision for an annual monitoring report on progress. The latest report (EC 2002) summarized progress and concludes: *"In summary, the Commission and ACEA currently have no reason to believe that ACEA would not live up to its Commitment"*[3]. ACEA has reached an average of 164g CO_2/km in 2001, ahead of the 2003 deadline for this level, and the improvements have been reached via technological developments as well as related marked changes. In this context the commitment could be seen as a success story for voluntary approaches to environmental improvements.

Analysing the success of the commitment

There are however, some questions to ask before reaching any conclusions:

- *How would CO_2 emissions have evolved without the pressure of the commitments?*
- *Does the development cause unanticipated side effects that might partly or fully offset the positive effects?*

The OECD has carried out a number of case studies on voluntary environmental commitments (not necessarily specific to CO_2)in different countries (OECD 2003) and concluded that voluntary commitments often meet objectives, but that these objectives would in most cases have been met for other reasons anyhow. The OECD has identified commitments on emission reduction targets, which will be achieved anyhow, as one of the major weaknesses of the voluntary approach. The participants are allowed to capitalize on planned improvements and often use the existence of the commitments as an argument why other regulations should not be put in place. This process may be considered to be a form of the phenomenon termed regulatory capture[4] in economic literature. In some cases voluntary commitments may thus prevent more stringent legislation while giving manufacturers credit for normal renewal of manufacturing plant.

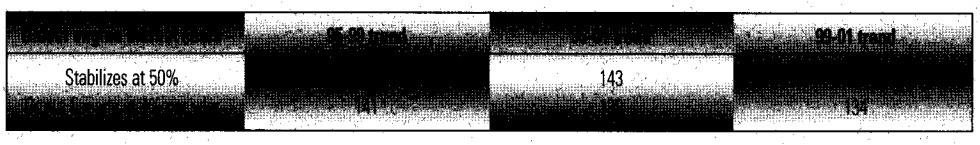
An important safeguard against regulatory capture is to develop an explicit baseline projection before the targets of an commitment are fixed. This will allow both sides of the commitment to better evaluate the level of ambition against the expected cost of accelerated emission reduction. An obvious problem, however, is the uneven access to information. Industry players will know some years in advance which technologies are likely to be used in production, and thus have a relatively solid background against which to estimate future baseline emission profiles. Regulators,

On February 5, 1999, the European Automobile Manufactures Association (ACEA) signed a voluntary commitment with the European Commission (EC) on reducing the average CO_2 emissions from new cars

The OECD has carried out a number of case studies on voluntary environmental commitments in different countries and concluded that although the objectives are often met, these would in most cases have been met for other reasons anyhow

Through a process of regulatory capture, in some cases voluntary commitments may sometimes enable more stringent legislation to be avoided

Table 2. Average CO_2 emissions in 2008 under different assumptions of trend and percentage of diesel vehicles in fleet



Source: Author's own projections based on data from EC, 2002

CO_2/km can thus be reached via a rate of development that does not differ significantly from the period before the commitment was signed if the increased diesel share is also taken into account.

This is not to say that industry is doing nothing, but rather that the voluntary commitment has not added significantly to the pressure already felt by industry. And the fact that it has reduced the probability of other interventions could be seen as a benefit for industry as this creates a more predictable regulatory environment[8].

If the projections are carried forward towards 2012 it will be possible to reach the 120g CO_2/km level desired by the EC g only under the most optimistic assumptions and if diesel account for 84% of all vehicles. Thus an extension beyond 2008 will require an increased effort[9].

Does the development cause unanticipated side effects?

Petrol and diesel are complementary products from the same feedstock (crude oil). Additionally a number of other products such as kerosene, heavy fuel oil, etc. will come out of the process. The natural composition of crude oil allows for a certain distribution of end products, but modern processing technologies allow a chemical conversion of some fractions into others. Conversion is associated with a consumption of energy, leading to a mix of final products with lower total energy content. Thus less processing generally equals more energy available in the end products. In considering the optimum distillate mix from an emissions point of view one has to take into account the efficiency of consumption of different products over the full fuel lifecycle. As diesel engines are more efficient than petrol engines, a higher "production cost" in terms of emissions can be justified by the higher end-use efficiency. The projections presented in Table 2 include a diesel efficiency advantage over petrol in the range of 15-28g CO_2/km thus presenting a significant incentive for automakers to promote diesel vehicles over petrol vehicles in order to meet commitment objectives.

At the "natural crude-oil composition point" diesel is produced at an emissions level of 10-15g CO_2/km while petrol generates roughly twice as much. The increasing demand for diesel forces refiners to apply conversion to a level where marginal diesel today is being produced at a slightly higher emission level than petrol[10]. This means that at present we are starting to see the production emissions of diesel eat into the advantage of the diesel engine over the petrol engine. There is still a slight advantage, but with increasing demand for diesel this could disappear[11].

A refiner optimizes his production based on economic criteria rather than on the emissions. Within the constraints given by the available supply of crude oil, environmental legislation and product standards, available refinery technology and market demand, he aims to produce the combination yielding the highest payoff. Increasing the

The trend would suggest that although manufacturers are clearly making an effort to improve emissions, the voluntary commitment has not added significantly to the pressure on them to do so

Petrol and diesel are complementary products from the refining of crude oil. Although there is a natural composition, to a certain extent modern processing allows more or less of each to be produced from the same feedstock

Increasing the proportion of diesel produced can mean consuming more energy, thus the greater energy efficiency of the vehicle comes at the price of lower energy efficiency at the refinery

ones (at present this is not the case). However, as diesel demand grows world-wide for the same reason as in Europe (i.e. the fact that it is the winning solution), prices will tend to increase and make FT diesel competitive. This leads to an increase in CO_2 emissions if one considers the whole fuel chain.

Thus the commitment is being adhered to but it seems likely that similar reductions would be achieved anyhow even without the commitment. An added benefit for the automakers is a reduced likelihood of other legislation in the field while the commitment is in force. A significant by-product however, is a shift in energy consumption away from the vehicles and onto the refineries. These are not part of the commitment, and so are not taken into account when the commitment is evaluated. The reaction of refiners to the challenge of providing more diesel may, although completely rational, jeopardize the achievements.

Thus we have two actors, one is inside the commitment and one outside. Both act so as to maximize the profits from their business and are doing so effectively. However, the sum of their actions may eventually undermine the value of the voluntary commitment on CO_2 emissions.

A policy solution in this case could be an commitment which covered the whole fuel chain from well to wheel. The administrative procedures needed to oversee such a framework might, however, be prohibitively complicated. It therefore seems likely that other more traditional measures either in form of taxes/incentives or direct regulations may be needed if further CO_2 emission reductions are to be reached in this field[15].

Biomass diesel is more environmentally friendly because it is carbon neutral. However, it is expensive to produce and can only compete if it is exempted from taxation

Keywords

voluntary commitment, CO_2, transport fuels

Notes

1. Petrol and diesel engines each work on different principles. In a petrol engine the fuel is compressed and then ignited with an electric spark. In a diesel engine it is compression alone that ignites the fuel. The principle used in the diesel engine is thermodynamically more efficient, therefore diesel engines are generally more efficient than their petrol counterparts (typically around 10%).
2. As ACEA accounts for more than 85% of the new vehicles sold in EU-15, the ACEA commitment is by far the most important.
3. The commitment with the Japanese automakers received a similar evaluation, whereas some concern has been expressed about the ability of the Korean automakers to live up to their commitment.
4. The theory of regulatory capture was set out by Richard Posner, an economist and lawyer at the University of Chicago, who argued that "regulation is not about the public interest at all, but is a process, by which interest groups seek to promote their private interest ... Over time, regulatory agencies come to be dominated by the industries regulated."
5. IPPC is the Integrated Pollution Prevention and Control framework, where a publicly funded secretariat develops reference documents on Best Available Techniques in a broad range of sectors. As industry players are participating in the process regulatory capture is possible, but the process is designed to minimize the impact.
6. "The negotiations lasted several years, but the impact of this pressure is difficult to measure. Compared to the US however, European automakers have improved significantly faster."

Improving Access to European Transport

Aristotelis Naniopoulos, *Aristotle University of Thessaloniki*

Issue: The number of people who face some form of mobility handicap at some point along the transport chain is estimated at over 50%. Moreover, as the number of elderly people increase in Europe, equality issues demand a more pro-active approach to the problem. Increased mobility within the EU means the numbers of travellers with language and local familiarity problems is also increasing. These issues suggest a need for appropriate policy and actions on a pan-European level, focusing on the establishment of accessible transport chains reaching throughout Europe in urban and interurban areas.

Relevance: "Planning and Design for all", along the whole transport chain, could become a prevailing issue for Europe in the coming years. To meet these demands effectively, European policy will have to move faster and more decisively in terms of legislation, promoting best practice and research.

Introduction

Transport chains, understood as the combination of all the forms of transport a travellers use to get from their point of origin to their destination (whether public, private, motorized, etc.) are made up of discrete parts involving various transport modes. It is not always easy for people to move smoothly along the chain and to use the different modes seamlessly. Indeed, for large swathes of Europe's population it is not possible at all, despite the efforts and advances achieved on various levels during recent decades.

One striking statistic is that more than 50% of people face some form of mobility handicap at some point along the transport chain. The issue is complex, due to the fact that the problems faced by the different groups of the population vary in type and severity and therefore appropriate support needs to address a heterogeneous range of difficulties. However, the percentage of people affected is too high to be ignored in political, social or marketing terms. Moreover any measures addressed primarily at people with mobility handicaps will make a significant contribution to improving the quality of transport for all.

There is no doubt that providing accessible transport chains in Europe is a challenging issue for policy-makers, scientists, society and industry. Practically speaking though, is it a feasible target or is it a utopia? The main objective of this article is to challenge the predominant but ineffective way of

The views expressed here are the author's and do not necessarily reflect those of the European Commission.

Transport chains are made up of various different modes. For people with mobility difficulties it is not always easy to move seamlessly between them

The percentage of the population with disabilities is usually estimated at around 12-15%. If other groups who may have difficulties with the transport chain are included, the overall figure rises to around 50%

The built environment and open spaces

The built environment, which includes buildings and constructions of all types used by people, including open spaces such as pedestrian areas, plazas, parks, visitable sites (e.g. historic monuments, beaches), presents various types of difficulties in their use by people with disabilities, e.g. stairs, narrow passages, obstacles of various kinds, etc. To help overcome some of these difficulties, many countries have set up regulations and design guidelines concerning the built environment which apply in particular to new buildings. At present there are differences, however, between the various EU countries and there is therefore a need for harmonization. Any such harmonization would need to be based on selecting best practice on purely scientific criteria, backed up with additional research and verification, where required, so as to provide effective guidance without restricting creativity while also providing room for new developments in the future. The setting up of a high level body to define pan-European regulations and design guidelines for the built environment and open spaces for adoption by all EU countries seems to be useful for two main reasons:

- The new accession countries (and any future accession countries) urgently require high quality harmonized guidelines which they can apply so as to avoid mistakes or the expense of starting from scratch.
- EU industry will benefit from significant economies of scale.

In addition to the guidelines on accessibility and mobility in the built environment and public space it would be necessary, especially for countries lacking the appropriate know-how (such as many of the accession countries) to adopt a framework code for the use of public space. This might be seen as something which relates to the local level and therefore the responsibility of local authorities thus, according to the subsidiarity principle, no EU-level action needs to be taken. However, in reality in many cases, citizens' rights (especially those of the disabled) are being violated by the misuse of public space (e.g. parking on pavements, overuse of pedestrian areas by shops, street furniture hindering seamless movement), thus making many city areas inaccessible and hostile for large sections of the population and even hampering those people's mobility across different regulatory systems.

Transport modes and terminals

Significant achievements have been made in Europe in terms of access to transport modes and terminals. However these have tended to only be in parts of the total chain and, moreover, to be limited to specific locations, thus making efforts to disseminate best practice essential.

For private cars extremely significant initiatives have been pursued at the EU level concerning the homologation of car adaptations (QVAVADIS) the issuing of a common driving licence, the impacts of new in-car systems such as Intelligent Transport Systems (ITSs) on driver with disabilities (TELAID). The interest of car manufacturers and the car industry as a whole to promote such issues[2] is an important push factor for the continuation of relevant actions at the EU level.

In the case of heavy rail, the working group (COST 335, 1997), has reported that most European railways are responding to needs of the mobility impaired, but there is still a variety of systems used, not all of them equally effective. Moreover, arrangements in stations are not always adequate, especially in the case of old station buildings.

Similarly in the case of metro systems one can find a mixture of highly efficient arrangements on new lines, together with the highly ineffective and practically inaccessible old ones. One particularly

Analogous to the issue of access to transport, the built environment also presents a series of obstacles to people with reduced mobility

Common guidelines for access and mobility in the built environment and public space would be a valuable way of helping all countries bring themselves up-to-date while avoiding duplicated efforts

Progress in almost all areas of transport has been patchy, with a mixture of the highly efficient arrangements together with inadequate and inaccessible ones