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The Effectiveness of EU Auto-Oil

A Slippery Business?

Jørgen Wettestad

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Abstract

The Auto-Oil process is a central ingredient of the EU's battle to control vehicle pollution. Previous research has focused on the policy-making phase, particularly the imbalanced stakeholder involvement. The time is therefore ripe to explore the impact of the Auto-Oil Directives on the industrial target groups, i.e. policy effectiveness. More behavioural change has taken place in the oil industry than in the car industry, and especially in the North. It is likely that EU's institutional machinery and its various mechanisms did help bring about these behavioural changes, by bringing about the new knowledge that cleaner fuel was essential in order to attain the agreed goals between the EU and the car industry on reduced CO₂ emissions. More importantly, the EU initiative to adopt a more stringent sulphur-in-fuels policy increased the pressure on the oil industry especially. But factors other than the EU's institutional machinery need to be taken into account in order to explain the events of recent years. For instance, EU policy development and domestic initiatives in this field clearly affected each other. Hence, in order to clarify Auto-Oil effectiveness further, both vertical and horizontal interactions need to be better understood.

Key Words

EU, Auto-Oil, air pollution, effectiveness, car and oil industries

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1 Introduction¹

The Auto-Oil process is one of the most interesting processes in EU environmental policy-making in recent years. The Auto-Oil I Programme was started in 1992 and the policy-making phase ended in 1998 with the adoption of stricter fuel standards and tighter emission limits.² This process is a central ingredient of the EU's uphill battle to control vehicle pollution.³ Emissions from vehicles harm air quality and add to human-induced climate change. Previous work on the Auto-Oil process focused on the policy-making phase, particularly the imbalanced stakeholder involvement.⁴ In essence, the car and oil industries were closely involved in the Auto-Oil Programme which produced the foundation for the subsequent directives, while other stakeholders such as Member States and environmental non-governmental organisations (ENGOS) were less involved and felt shut out of the process (e.g. Friedrich et al., 1998, 2000; Young and Wallace 2000; Weale et al. 2000).

However, in terms of really contributing to reducing vehicle pollution, Auto-Oil policies need to be implemented and lead to substantial changes in industrial practices. The time is therefore ripe to explore the impact of the Auto-Oil Directives on the industrial target groups, i.e. policy effectiveness. Policy effectiveness can be defined as results in the form of behavioural change in target groups *caused* by the institution in question (in this case the EU), leading to environmental improvements (Skjærseth and Wettestad 2002). The case of Auto-Oil is interesting in this regard. Although the links between stakeholder involvement and the character of the policy-making process and subsequent policy effectiveness are certainly complex (e.g. Beierle and Cayford 2002, Hemmati 2002),⁵ several elements of the policy-making phase suggest substantial behavioural change and, hence, high policy effectiveness: on the one hand, there is the high involvement of the car and oil industries in the initial and more technical Auto-Oil Programme which could mean high target group sense of 'ownership' and legitimacy of the process. On the other, the forceful involvement in the final policy-making phase of several parties able to balance the influence of the industrial camp added much more bite to the directives that were adopted in 1998.

Given this scenario, we ask in this report whether substantial behavioural changes have taken place in the oil and car industries in the wake of the 1998 adoption of the Auto-Oil Directives? Second, if they have, can they be accounted for by factors and mechanisms related to the EU institutions – or might other factors offer a more convincing explanation for the behavioural changes witnessed? Third, what kind of lessons about the effectiveness of EU policies and the challenges of assessing such policies can we draw on the basis of the answers in this case?

In section two, then, we look at the policy-making process as it relates to stakeholder involvement, counterbalancing forces and final behavioural bite.

In section three we trace behavioural changes in the oil and car industries in the wake of the 1998 Auto-Oil Directives. Such changes include the development of major industry positions and formulation of relevant strategies, technological changes and changes in the marketing of cleaner

fuels, and the development of emissions. With regard to the latter indicator, extra caution is required. It is well known that industrial emissions may decrease due to factors such as economic down-turns and energy switching, factors which may have nothing to do with EU or even environmental policy.

To find then whether these changes could be seen as signifying EU policy effectiveness, we scrutinize the possible impact of three central institutional pathways and mechanisms through which the EU can influence industrial target group behaviour (Skjærseth and Skodvin 2003; Skjærseth and Wettestad 2003). These three perspectives are compatible with three well-known causal mechanisms of knowledge, interests and power within the field of regime studies (e.g. Young and Osherenko 1993, Hasencllever et al 1997).

- First, EU-sponsored scientific *knowledge* on the seriousness of the environmental problems and – not least – new knowledge on technological ‘fixes’, may lead to a changed industrial perception of the need and possibility to establish abatement measures.
- Second, the adoption of a *strong and consistently worded EU policy* may simply convince the industry that the EU, so to speak, ‘means business’ and hence the industry may feel forced to green its activities – as further opposition and non-compliance may seem fruitless.
- Third, the EU may *increase the interest of the industry in choosing a greener path* by introducing new market opportunities for such greener (alternative) products. For instance, in the climate change context, EU funding and political priority given to renewable energy and technologies for energy efficiency may stimulate the industry’s interest in giving more priority to these fields in relation to the traditional fossil fuel priorities and products.

Might there be other obvious causal drivers than EU institutional mechanisms that could shed light on the degree of behavioural change among targeted industries? There are at least three interesting possibilities.

- First, there are clearly important domestic policy initiatives which influence target group activities. If we look closer, perhaps the real driving forces are domestic with the EU processes providing little more than the ‘icing on the cake’?
- Second, as most European industries are global in outlook and structure, the reason for behavioural changes may have something to do with global market forces and the reluctance of EU actors to do things which could impair their global competitiveness.
- Third, if the behavioural change witnessed is only moderate, this may simply be the result of a tough baseline, where significant technological changes and reduction of emissions took place before the policy in question was adopted and the economic *raison d’être* and potential for further reductions is limited.

Section four winds up the report. Does the case of Auto-Oil indicate that it is possible and meaningful to measure the effectiveness of EU environmental policies – or is it too much of a ‘slippery business’?

2 Background: the industry-dominated Auto-Oil Programme and the political response

2.1 Introduction

As the twists and turns of the Auto-Oil decision-making process have been ably detailed elsewhere (e.g. Friedrich et al 1998; Young and Wallace 2000; Wurzel 2002), I shall here only sum up the important stages and turning-points of the process as a backdrop for the more specific discussion of subsequent industrial behavioural changes and possible EU policy effectiveness. In terms of central euro-federations in this story, the car-makers' euro-federation ACEA (Association des Constructeurs Européens d'Automobiles) is a central actor, others being the oil industry's euro-federations CONCAWE (European Oil Industries' European Organisation for Environmental and Health Protection) and EUROPIA (European Petroleum Industry Association).

2.2 The Auto-Oil Programme and Commission proposals: heavy industry involvement, but not satisfaction

At the 1992 Auto-Oil Symposium, the Commissioners for Environment, Industry and Energy invited ACEA and EUROPIA to collaborate in the realisation of a technical research programme. The Auto-Oil I Programme was started in 1992, with heavy industry involvement. The Programme contained the three main elements of urban air quality studies, an emissions and fuels technology programme, and cost-effectiveness studies. It was completed in 1995 and the Commission put forward directive proposals on stricter fuel standards and tighter emission limits in June 1996. Among the Member States, one main reaction to these proposals was that they were surprisingly lax, especially the proposed fuel standards⁶ and the Commission was criticised for suggesting no 2005 fuel standards and only indicative emission limits for 2005.

However, the industries were not very satisfied either. With regard to EUROPIA and the oil industry, according to Young and Wallace (2000:46), 'as a result of both adopting a precautionary approach and seeking to head off member government objections, the Commission in June 1996 advanced proposals that were significantly stricter than either industry felt justified on the basis of the Auto/Oil Programme's findings'. However, EUROPIA was content that the Commission did not propose standards for 2005. ACEA was also highly critical on behalf of the car industry, claiming that the Commission proposals placed 'nearly all the effort' with the car manufacturers, while requiring 'very little improvement' in fuel quality. The organisation also objected to any tightening of standards beyond the year 2000, arguing that the initial measures would be sufficient to achieve air quality objectives by the year 2010 (ENDS Report 1996).

2.3 Finalising the Auto-Oil Directives: counter-balancing forces strengthen behavioural bite

The European Parliament critically discussed the proposals in the spring of 1997, out of which came suggestions for stricter emission limits and

fuel standards and binding 2005 limits. When the Environment Council of Ministers met in June 1997, the critical inputs from the Parliament served as the main backdrop. Described as ‘a rare decision where the European Union’s Council of Ministers strengthened an environmental legislative proposal from the European Commission’ (International Environment Reporter 1997), the Ministers unanimously adopted stricter fuel standards than those proposed by the Commission.⁷ This signalled a focus from now on very much on the fuel standards issue and especially the sulphur limit.

When the Parliament’s second reading in February 1998 ended with a call for stricter 2005 fuel standards than adopted by the Council and also mandatory 2005 requirements, the matter had to be settled through conciliation.⁸ A final outcome was ready in June 1998. Parliament’s call for mandatory 2005 standards was largely successful. However, the fuel standards remained in line with the Council’s 1997 decision. The Auto-Oil conciliation deal was formally adopted by Parliament and Council in mid-September 1998.

- With regard to *Directive 98/69 (relating to passenger cars and light commercial vehicles)*, targeted substances are carbon monoxide (CO), hydrocarbons (HC), nitrogen oxides (NO_x) and, only for diesel cars, particulates. The Directive tightened existing emission limits in two stages (2000 and 2005).
- In *Directive 98/70 (relating to the quality of petrol and diesel fuels)*, a key 2000 target was petrol with 150 parts per million (ppm) of sulphur (down from the estimated market average of 300 ppm); and diesel with 350 ppm of sulphur (down from the estimated market average of 450 ppm). For 2005, the petrol sulphur target was 50 ppm (see Haigh 2004 sections 6.8 and 6.20 for more information about these Directives)

This development aggravated industry dissatisfaction. In the final phase the oil industry lobbied the European Parliament intensively but only managed to upset policy-makers (e.g. Wurzel 2002:167). There were also splits and rivalries both within industries and between them. For instance, in the oil industry, Southern refineries and industrial actors were more critical and negative than Northern actors. With regard to inter-industry relations, in the phase of conciliation, the car industry actively lobbied for stricter fuel standards! (e.g. International Environment Reporter 1998). The Auto-Oil I outcome has been described as a substantial strengthening of EU policy in this field. For instance, according to Grant et al (2000:195), ‘the overall plan is an ambitious one and represents one of the most significant steps forward to date in the improvement of European air quality’.

As indicated above, this stronger behavioural bite could be interpreted as a response to the perception of the Auto-Oil Programme as industry dominated. This led to a strong alliance of counter-balancing forces. In terms of government positions, there was a strong coalition of ‘old’ and ‘new’ green EU champions (i.e. Germany, Denmark, the Netherlands, Austria, Finland, and Sweden), joined by countries such as Italy, pushing for a tightening of standards. This coalition received a boost when newly

elected governments in France and the UK in spring of 1997 climbed on board this process's 'green wagon'. Process insiders also emphasise the importance of this process being run by the environment ministers, 'it got nowhere near the transport ministers'. Moreover, a clear majority in the European Parliament supported tighter fuel standards and emission limits than those preferred by the Commission. Furthermore, the Parliament was the undisputed driving force for clear and binding 2005 limits. Finally, there was some intensive lobbying by environmental NGOs and consumer organisations.

As indicated in the introduction, a tougher behavioural bite could lead us to suspect substantial policy effectiveness. With regard to the high industrial involvement in the Auto-Oil Programme could also mean a relatively high sense of process 'ownership' and legitimacy, despite several setbacks in the final policy-making phase. Let us turn to behavioural changes in the industries and the challenging question of policy effectiveness.

3 Behavioural changes in the oil and car industries: how substantial and to what extent due to Auto-Oil?

3.1 Behavioural change: the development of strategies, technological change and emissions

What has happened then in the targeted industries? As indicated, there are several types of behavioural evidence, including the development of positions/strategies, changes in technology and the market share of fuels, and the actual development of emissions. Whether such changes can be attributed to the EU and the Auto-Oil process and Directives will be discussed below.

3.1.1 Fuel quality and the oil industry: rhetorical resistance – but swift technological and marketing changes in the North

Turning first to the issue of fuel quality, the oil industry and its euro-federation representatives EUROPIA and CONCAWE are by nature the main targeted actors. In terms of strategies and positions, there have been no fundamental changes, but certain adjustments can be noted. With regard to the initial positions taken by the industry, they were the familiar ones. Take for instance the discussions in connection with the Auto-Oil follow-up directive on tighter sulphur limits. As I elaborate in the following sections, the EU Commission published a draft directive on 'The Quality of Petrol and Diesel Fuels' in May 2001, a central element of which was the further reduction of sulphur in road transport fuels from the 50 ppm maximum limit by 2005 agreed on in Auto-Oil I to a 10 ppm maximum (to be phased in from 2005 to 2011).

In the discussions leading up to this directive, EUROPIA initially continued to emphasise the problems related to moves towards lower-sulphur fuels and that such low-sulphur options would increase CO₂ emissions at refineries, since they would require more complex and energy-consuming

processes (*ENDS Daily* 2000 B). A first agreement on the Directive was reached in the Council of Ministers in December 2001, including a ‘sulphur-free’ deadline moved forward to 2009. This was not welcomed by the oil industry, which warned about costs higher than 10 billion euros over 15 years (Reuters/Planetark 2002). However, at this point the industry seems to have seen ‘the writing on the wall’, and started to adjust its strategy and positions accordingly. For instance, commenting on this process in a 2002 status report, EUROPIA stated that it ‘welcomed the progress made by the Directive in 2001’, as it was ‘committed to supporting the significant investment involved, specifically the introduction of low sulphur road transport fuels’ (EUROPIA, 2002).

In the final phase of this process, EUROPIA’s lobbying therefore concentrated mainly on the secondary issue of avoiding an extension of stricter fuel quality standards for off-road vehicles. In this effort, EUROPIA was quite successful, and told *Environment Daily* in December 2002 that they ‘supported the outcome of the conciliation process’ (*ENDS Daily* 2002 B).⁹ This was further confirmed when the Directive was formally adopted in February 2003. In this connection, EUROPIA’s Bruno Celard stated that ‘[i]t has become law, so of course we will meet it’ (Reuters/Planet Ark 2003).

Given the sustained resistance to policy initiatives in the field of ‘sulphur-in-fuels’, one would probably expect this ‘negative’ strategy and position to be accompanied by little marketing and technological change in practice. This seems not to be so, at least judging by the actions of British Petroleum (BP) in the UK and Germany. In the UK, things proceeded rapidly in the wake of the adoption of Directive 98/70 (Quality of petrol and diesel). First, the British Chancellor of the Exchequer increased the tax differential between conventional and ultra-low sulphur diesel. This move allegedly led to only a modest increase in the availability of low-sulphur diesel. However, early in 1999 all the UK oil majors announced that they would soon be switching to the exclusive supply of low-sulphur diesel. By the middle of 1999 this transition was virtually complete (Haigh 2003:6.20–4).

With regard to petrol, developments took a little longer. Again, government tax differentials and policies either favouring or requiring low-sulphur alternatives were put in place, and the oil companies, both in the UK and Germany, responded to them. BP launched a global Cleaner Fuels programme in early 1999. In November 2000, BP announced a breakthrough in petrol desulphurisation technology: the OATS process (BP Press Centre 2000).¹⁰ Then, in the same month the UK government announced that they would be introducing a two pence differential between ultra low-sulphur petrol and regular petrol with the 2001 budget, provided the oil companies were able to make low-sulphur petrol available by the end of March 2001 (Haigh 2003 op. cit.).

A February 2001 review found the major oil companies to be on course. Hence, as pointed out by Haigh (*ibid.*), ‘all diesel and petrol sold in the UK now met the 2005 fuel quality standards with respect to sulphur *over three years earlier than required*’ (my italics). This progress continued when BP in November 2001 announced that the first commercial unit

using the OATS process had begun production of ultra-low or sulphur-free petrol. The unit was based in Neustadt and 'would help the refinery ... to meet new German standards for gasoline, which will require maximum sulphur concentrations of 10 ppm by 2003' (BP Press Centre 2001). In mid-February 2002, BP claimed a world first by offering sulphur-free grades of both petrol and diesel at the same retail sites in Edinburgh. This was part of the industry-leading cleaner fuels programme launched by BP (BP Press Centre 2002; *ENDS Daily* 2002). At the same time, in addition to marketing sulphur-free petrol in Germany, BP also started marketing sulphur-free diesel in Sweden (*ENDS Daily* 2002).

This impression of wide-ranging changes in fuel marketing strategies in countries such as UK and Germany finds further confirmation in the first EU report on the implementation of Auto-Oil Directive 98/70 (i.e. on the quality of petrol and diesel fuels) (EU Commission 2004). Overall, by 2002, low-sulphur fuels had already attained a market share of 47 per cent for petrol and 43 per cent for diesel (Ibid: 11). However, given the opposition of industries and oil refineries located in the Southern Mediterranean states in the policy-making phase, it can be argued that the real test of policy effectiveness would be the degree of implementation taking place in these countries. According to the 2004 EU implementation report, progress is less marked in countries such as Greece, Italy, Portugal and Spain, which by 2002, had still not introduced separately marketed low- or sulphur-free fuels at all (ibid.: 3).

3.1.2 Vehicle emissions and the car industry: obedient positions, technological adjustments, and decreasing emissions

Turning then to the issue of vehicle emissions, the car industry – and its euro-representative ACEA – moved to the forefront as a target group. Let us first quickly recall that Directive 98/69 tightened up the emission limits initially set by Directive 94/12 for the years 2000 and 2005. Both light commercial vehicles as well as petrol and diesel cars were covered.

In terms of strategies and positions, ACEA have retained their basic, generally quite positive attitude to EU regulations. However, developments within the oil industry in terms of coming up with low-sulphur fuels have regularly been emphasised as a significant factor. So when Germany launched its call for sulphur-free fuels in the fall of 1999, European car-makers quickly rallied behind Germany's initiative and started lobbying the Commission (*ENDS Daily* 1999 B).¹¹ Later, in April 2000, ACEA and several other vehicle manufacturers called for sulphur-free gasoline and diesel fuels (5–10 parts per million) (ACEA, 2000 A).¹² This call was explicitly formulated as a 'response to emerging requirements for more stringent vehicle emission controls and reduced fuel consumption ... in Asia, *Europe* and North America' (my italics). The link to cleaner fuel was also emphasised, as on-going efforts to tighten and harmonise vehicle emission standards highlighted the need for cleaner and harmonised fuel standards (see also ACEA, 2000 B). This continuing emphasis on the need for improved fuels led to a certain re-emergence of earlier clashes between the car and oil industries (*ENDS Daily* 2000 C).

Although the car industry has taken steps to modify technology, reduced emissions require cleaner fuels, meaning that what we have is more of the nature of adjustments than major modifications. Experienced observers acknowledge that the push towards compliance is generally high within the car industry, due to the high costs of calling back and retrofitting produced models. There are therefore clear incentives to respond swiftly and appropriately to political signals in the first place.

Let us sum up some of the important developments. Already in ACEA's first response to the 1998 Auto-Oil outcome, specific actions and changes were announced (ACEA 1998). First, by 2000, new models (and by 2001 all relevant vehicles) would be fitted with engines 'delivering a first substantial contribution' to meeting the goals. Estimated costs for the motor industry were about 64 billion ECU. In terms of the technological capacity to reach the 2005 standards, industry made it plain that 'massive additional investments in research and development are still required as the requested technologies are not yet available'. Judging by the status report of the automotive industry in 2002 (UNEP/ACEA 2002), major car manufacturers had made technological progress in various areas, especially with regard to diesel vehicles. For instance, both Peugeot Citroën, Izuzu and Volkswagen had introduced direct injection engines which reduce fuel consumption significantly (Ibid.: 31, 32).

Turning finally to the proof of the pudding and the development of emissions, in light of the above, one might expect to find evidence of reduction in terms of emissions per vehicle and transport emissions at large. And this is what we do find, though it is hard to find data on recent developments (i.e. after 2000). For longer-term historical trends, if we look at the very rough picture and the overall nitrogen oxides (NO_x) and volatile organic compounds (VOC) emissions from passenger cars, it is clear that the unbroken rise witnessed throughout the 1980s halted in the 1990s.¹³ Substantial reductions in emissions of NO_x, VOCs, carbon monoxide, particulate matter and benzene from EU road transport were achieved in the decade up to 2000 (EU Commission 2000). However, as noted, it is hard to find data on recent developments. Still, for what they are worth, projections ahead generally look good. For instance, the EU's Auto-Oil II Programme's projections for the years ahead indicate steady, further reductions (Ibid.: 42–47).¹⁴ ACEA's own NO_x emissions per unit projections for 2010 for cars, buses and trucks reckon with a more than 50 per cent reduction of the 2000 levels. For passenger cars, the VOC picture is quite similar (ACEA 2001:11).

3.1.3 *Summing up*

All in all, taking these bits and pieces of evidence together, they do build up to a picture of relevant and significant behavioural changes by the oil and car industries in the wake of the adoption of the Auto-Oil I Directives – although significant pressures were in operation *before* these Directives were adopted, as witnessed by the decreasing emissions of the 1990s. With regard to the oil industry, positions have changed, but only reluctantly and seemingly as tactical responses. When things are decided and become inevitable within the EU policy process, the industry has adjusted its positions and moved on to new 'resistance points'. Marketing and

technological change has been surprisingly rapid, but clearly uneven, and there has been more of it in the north than in the south. It should also probably come as no surprise that rhetorical resistance goes hand in hand with technological changes and adjustments in practice.

Compared to the oil industry, the car industry has had an easier ride in the wake of the Auto-Oil I Directives. This is because an important ingredient of the industry's compliance – i.e. cleaner fuels – was financed and provided by the oil industry. No wonder the journal *Acid News* has characterised developments in EU policy-making in this context as 'a gift to auto makers'.¹⁵ The latter's positions on EU regulatory initiatives have been fairly positive; some necessary technological adjustments have been made; and vehicle emissions have continued to decrease, both in total and per unit.

It is therefore clear that EU policy is in some way behind these developments. But to expand the picture in terms of causality, the main driving factors and hence the real effectiveness of EU policy-making, we need to pursue a more detailed scrutiny of the explanatory factors.

3.2 Explaining behavioural changes in the oil and car industries: how and to what extent has EU institutional capacity mattered?

3.2.1 EU institutional mechanisms: knowledge, pressure and possibilities

To repeat, the EU can influence target group behaviour in at least three different ways: first, EU-sponsored scientific knowledge on the risks posed by environmental problems and – not least – new knowledge on technological 'fixes', may affect industrial perceptions of the need and possibility to establish abatement measures. Second, the adoption of a strong and consistently worded EU policy may simply convince the industry that the EU so to speak 'means business' and cause the industry to green its activities – as further opposition and non-compliance seem to be fruitless. Third, the EU may persuade industry to choose a greener path by introducing new market opportunities for such greener (alternative) products. Let us take a closer look at these in turn.

Changing perceptions? Realising the crucial link to climate change

Did new knowledge prompt implementation and behavioural change in the oil and car industries? The answer is yes. An important element here was the core insight that *cleaner fuels are just as important for climate change goal attainment as they are for the attainment of air pollution and air quality goals*. As described by Goodwin (2001), the EU had adopted a strategy to reduce CO₂ emissions from cars in 1996, one main element of which was the 1998 voluntary agreement between the Commission and European car manufacturers, calling for a 25 per cent reduction of car CO₂ emissions by 2008 (Wettestad 2001). In their work on this agreement, national governments and the Commission realised that 'if manufacturers were to honour this agreement *without downsizing their model ranges* they would need to use direct injection engines that would require almost zero sulphur fuel' (Goodwin op. cit.: 3).

Although this insight was gaining ground in the very final phase of the Auto-Oil I negotiations it came too late to have much of an impact. But when Germany started a new sulphur-free fuel campaign in the fall of 1999, it did so within a more benign cognitive landscape. When the Commission launched its directive proposal in 2001, a central reason was that cleaner fuels would facilitate the introduction of new, more fuel-efficient engine types, with advanced catalysers requiring such fuels (*Acid News* 2001).

This cognitive change probably influenced both the oil and car industries' positions and their implementation behaviour in general. First, it generally strengthened ACEA's campaign for cleaner fuels; a campaign with roots back to 1996.¹⁶ For instance, in connection with a lobbying letter to the Commission in December 1999, ACEA stated that 'the future is clearly sulphur free' (*ENDS Daily* 1999 B). Conversely, however, this weakened EUROPIA and the oil industry's resistance to this 'zero-sulphur' drive. EUROPIA responded to this cognitive change by emphasising instead a possible net increase in CO₂ emissions. Indeed, EUROPIA's president Paul Vettier stated in May 2000 that 'if the production of these enabling fuels requires more complex and energy-consuming processes, this will result in additional CO₂ emissions from the refineries which needs to be balanced against the saving expected at the vehicle level' (*ENDS Daily* 2000 B). However, EUROPIA was not successful in stemming the tide, which may have something to do with the emerging divisions within the oil industry; with actors such as BP doing things that in practice were vocally resisted on grounds of principle by the euro-federation. BP, and other companies, simply saw the writing on the wall.

The exact role of the EU institutional machinery which brought about this new knowledge invites exploration. Did the new knowledge emanate from the Auto-Oil II Programme, which had been turned into a mainly knowledge-improvement effort after Auto-Oil I settled most of the political, standard-setting tasks? According to Goodwin (op. cit.: 3), the relevant Auto-Oil II working group agreed to limit their investigations to those parameters that were not covered by the 2005 standards in the Auto-Oil I Directive. The sulphur-free option was therefore not included in their work. Goodwin suggests that this was the result of successful oil industry lobbying (ibid.), which means that although the Commission and the Council were involved in bringing about the new interplay knowledge, the Auto-Oil II Programme did not contribute much to this cognitive change.

Increasing regulatory pressure? The new sulphur-free drive

It seems clear that the start of a new EU directive process for further sulphur reductions in fuels following the adoption of the Auto-Oil I Directives increased pressure, especially on the oil industry, to implement the 1998 Directives, indeed, even moving beyond the standards set out in those Directives. The Commission again adopted a broad, consultative approach to the matter and both EUROPIA and ACEA produced specific position papers that were fed into the process. Nevertheless, it quickly became clear where the process was heading. The Council came out in support of the Commission's proposal in December 2001, at least in prin-

principle. The European Parliament once again pressed for even more ambitious policies, especially in its demand for a 2008 instead of 2011 deadline. This institutional dynamic meant that the oil industry and EUROPIA had to fight on several fronts, against the Commission's proposal, and against a worst-case scenario, in which the Parliament won through with its demands. Things were not made easier by the apparent split within the oil industry. For instance, in October 2001, the EP rapporteur Heidi Hautala stated that some refiners had told her that the more ambitious 2008 deadline was 'realistic and could be met' (*ENDS Daily* 2001 C).

Another 'pressure-producing' matter related to the cognitive shift described in the previous section was the increasing political weight of the Auto-Oil Directives after the link to climate change was realised. Before 1998, the quality of fuels within this context was primarily important in the battle against urban air pollution. After 1998, the importance of cleaner fuels for achieving climate change goals was increasingly emphasised.¹⁷ This is illustrated by Environment Commissioner Margot Wallström's January 2002 comments, to the effect that 'sulfur-free fuels will speed up the introduction of the latest fuel-efficient technologies in cars and other vehicles....This will significantly reduce emissions of carbon dioxide – the most important greenhouse gas. In addition, these fuels will help clean up the emissions of older, more polluting vehicles and improve air quality.' (*International Environment Reporter* 2002).

3.2.2 *The potency of rival explanations: domestic activism, global competitiveness – or simply a tough baseline?*

There are several rival explanations to the EU perspective discussed in the previous sections. As noted, such rival explanations include the role of more purely domestic factors and politics; the possibility of global harmonisation, i.e. the reluctance of EU actors to do things which could impair their global competitiveness; and the possibility of a tough baseline, where limited behavioural change may simply be due to substantial industrial change and reduced emissions having taken place prior to the policy in question. Here, I concentrate mainly on the domestic factors perspective, already hinted at in the discussion of behavioural change in the oil industry and the UK tax dynamics, with a cursory glance at rival factors.

Domestic activism?

As indicated earlier, at least in some countries, it is clear that there was significant interaction between domestic policy-making and EU politics. In addition to the UK, the case of Germany is obviously illustrating. In the 'sulphur in fuels' context, Germany stands out as a central policy forerunner. In October 1999, Germany submitted a memorandum calling on the Commission to propose before the end of the year that all petrol and diesel sold in the EU be 'sulphur-free' from 2007 (*ENDS Daily* 1999 A). After that, there was some interesting interaction between domestic initiatives and EU policy-making. In 2000, Germany followed up its initiative by suggesting the provision of specific tax incentives, in order to speed up the introduction of sulphur-free petrol and diesel from 2003. The Commission stated that it needed time to evaluate the suggestion and

it became a subject for discussion by the EU bodies. In this situation, it is interesting to note that ACEA expressed great disappointment that the Commission had not immediately backed the German initiative (*ENDS Daily* 2000 A). At the time, February 2001, the German request to provide such incentives was approved by EU finance ministers (*ENDS Daily* 2001 A), a decision that inspired other Member States such as the Scandinavian ones, France, the UK and the Netherlands to follow suit (*ENDS Daily* 2001 B).

We see then that even a policy front-runner such as Germany needed approval from the EU. Once this has been given, it inspired domestic action in other Member States. Thus in the Northern part of the EU, the case is primarily one of *interplay*. In order to capture the central driving dynamic it is not sufficient to understand EU institutional or domestic dynamics separately. However, in other EU states such as Spain, Italy and Greece, it is likely that EU policy and institutional mechanisms were the main driving forces. Based on the records of these countries, in other EU air pollution policy and implementation processes domestic policy factors if they played any role at all, have probably retarded these processes (Underdal and Hanf 2000; Wettestad 2002).

Global harmonisation?

As indicated, both the car and fuel industries are global in outlook and structure. Hence, the reasons for the behavioural change witnessed may have something to do with global market forces and the reluctance of EU actors to do things that could impair their global competitiveness. At least with regard to the car industry, policy initiatives and technological developments have clearly taken place within a global framework. As mentioned, there was a 'world wide fuel charter' launched by European and international car manufacturers in the summer of 1998. Since 1996, US, European and Japanese automotive manufacturers had met and discussed the need for worldwide fuels harmonisation.

So what about the oil industry? As mentioned, BP launched its global Cleaner Fuels programme in the beginning of 1999. In May 2000, a World Fuels Conference was held in Brussels, at which the president of EUROPIA's identified the main challenge and driving force as being policy development within the EU. A key message was that much was achieved by the Auto-Oil I process and there was little need to go any further along the road of more stringent fuel specifications (Vettier/EUROPIA 2000). It is clearly vital therefore to keep the global perspective in mind to understand especially the car industry's, but also to some extent the oil industry's, positions and actions in this field. That said, the main driving force behind moves taken by European companies remains the dynamic interplay between EU policy-making and domestic actions as described in the previous section.

Simply a tough baseline?

As indicated, emission trends were already pointing downwards when the Auto-Oil Directives were negotiated and adopted. Might the seemingly moderate behavioural change witnessed in the car industry simply be the

result of a tough baseline, where significant technological change had taken place before the Auto-Oil I Directives were adopted and the economic *raison d'être* and hence potential for further reductions were limited?

What actually happened in the 1990s in terms of technological change and vehicle emissions? In the period 1990–98 a significant decrease in transport and vehicle emissions can be noted. According to the EEA (2002:29), 'Technology and fuel improvements (in particular the introduction of catalysts and stricter emission regulations for diesel vehicles) have led to significant reductions in these emissions. *Without these measures, nitrogen oxide emissions from traffic in the EU would have been 50% higher in 1998*' (my italics). Significant improvements in *vehicle technology* do seem to have been adopted prior to the adoption of the 1998 Auto-Oil Directives. In the light of this, it makes sense that policy attention in recent years has largely shifted towards the issue of fuel quality.

4 Assessing Auto-Oil policy effectiveness: a slippery multi-level and multi-issue business

Both EU policy-making circles and the research community have paid increasing attention recently to the true effectiveness of EU policies, in terms of significantly influencing and changing the behaviour of target groups in the desired direction. The case of Auto-Oil is interesting because we have substantial knowledge about both stakeholder involvement and the character of the policy-making processes that ended with the adoption of two key directives on fuel quality and vehicle emissions in 1998. Although the links between the character of the policy-making phase and subsequent policy effectiveness are complex, several characteristics of the policy-making phase suggest substantial behavioural change and hence a high degree of policy effectiveness. On the one hand, the significant involvement of the car and oil industries in the initial and more technical Auto-Oil Programme could imply a strong sense of target group 'ownership' and legitimacy of the process. On the other, the forceful involvement of several counterbalancing forces in the final policy-making phase, offsetting the industrial actors, led to the adoption in 1998 of directives with substantial behavioural bite.

Against this background, the first question addressed in this report was whether substantial and relevant behavioural changes had taken place in the oil and car industries in the wake of the 1998 adoption of the Auto-Oil Directives? The most conspicuous – but also most hard won – behavioural changes were indeed adopted by the oil industry. This is much related to a more structural shift in EU vehicle pollution policy-making since the mid-1990s as its focus gradually shifted increasingly towards the quality of fuels. This naturally put the oil industry in the regulatory limelight. Although the oil industry has only reluctantly adjusted its positions in the wake of the Auto-Oil Directives, changes happening more locally and bottom-up eroded the likelihood of a very forceful resistance. Particularly in Northern Europe significant behavioural changes within the oil industry can be observed, with official positions following

suit. The car industry has had a much easier ride. Certain behavioural adjustments were made - enough to ensure a continued decline in emissions and promising projections for the years ahead.

As to the second main question addressed in the report, i.e., that of effectiveness, the extent to which these changes are explained by factors and mechanisms related to the EU institutions, or whether other factors prove to be more plausible, was discussed. It is likely that EU's institutional machinery and its various mechanisms helped to bring about the observed behavioural change in both the oil and car industries. The EU bodies played a role in generating the new knowledge that cleaner fuel was simply essential in order to attain the agreed goals between the EU and the car industry on reduced CO₂ emissions. More importantly, the EU initiative to adopt a more stringent sulphur-in-fuels policy, which started just after the adoption of the Auto-Oil Directives, increased the pressure on the oil industry especially. The strengthened links made at this point to the increasingly important climate change issue added extra impetus to this EU regulatory 'spring tide'.

Having said that, it seems clear that factors in addition to the EU's institutional machinery need to be taken into account in order to explain the events of recent years. EU policy developments and domestic initiatives clearly affected each other. Germany in particular pushed both for extended EU policy-making while seeking to give domestic policies a more 'sulphur-free' flavour. In the UK, domestic tax policies yielded rapid industrial response. It is also clear that global concerns affected the positions and behaviour of the car industry. Indeed, global political signals, rather than contradicting European signals, actually added to them, though the latter meant most to European companies. Having said all that, we also need to understand why behavioural change was not *that* strong, especially in the car industry. The steadily decreasing emissions during the 1990s made the 1998 baseline quite a tough act to follow. Substantial technology development had already taken place by the time Auto-Oil I implementation started.

Finally, which lessons might be drawn from this particular study of the effectiveness of EU policies and the challenges of assessing such policies? The analytical framework used in this report is a step in the direction of developing a comprehensive and practical tool to improve our knowledge of this crucial aspect of EU policy, not least the three mechanisms and pathways of EU influence: generation of new knowledge; added political pressure; and/or the provision of new opportunities. This first study of Auto-Oil shows that the causal challenge related to the measuring of effectiveness is really serious. As the EU advances its 'multi-level governance', linking the various levels of government in new ways (cf. e.g. Weale et al. 2000; Hooghe and Marks 2001), the challenge in terms of distinguishing and measuring the effects of the various parts and policy levels will inevitably be exacerbated. In the case of Auto-Oil, policy-making at the EU level and the domestic level clearly reciprocate. Another link in the case of Auto-Oil is between air pollution and climate policy-making and policies. We are therefore not only dealing with a vertical level; clear horizontal interactions between different policy fields need also to be taken into consideration (cf. e.g. Oberthur and Gehring,

eds., 2006; Wettestad, 2006). This report has only begun to clarify the extent and character of these multi-level and multi-issue links and their importance for the effectiveness of the Auto-Oil Directives.

Notes

¹ Thanks to Kristin Rosendal and Jon B. Skjærseth for helpful comments. Thanks also to Chris Saunders for language polishing.

² As all main regulatory issues were settled in the Auto-Oil I phase, the planned Auto-Oil II phase was redesigned into a knowledge improvement effort.

³ As will be shown later, vehicles have become considerably cleaner. But increasing numbers and use have turned policy making into an uphill battle both in Europe and elsewhere. See e.g. EEA (2002 A).

⁴ Hemmati (2002:2) defines 'stakeholders' as 'those who have an interest in a particular decision, either as individuals or representatives of a group. This includes people who influence a decision, or can influence it, as well as those affected by it'.

⁵ We know from previous studies that a high involvement of stakeholders may have both positive implications for implementation and effectiveness (e.g. enhancing the legitimacy of the outcome) and more negative implications (e.g. prolonging the process and watering down of policy) (e.g. Victor et al. 1998; Beierle and Cayford 2002; Hemmati 2002). In fact, after an extensive survey of US cases, a central finding of Beierle and Cayford (2002) was that the relationship between public participation in policy-making and subsequent implementation is complex and 'tenuous' (p.55), where public participation is only a small part of the causal picture, and there is overall a 'moderate relationship' (pp. 56, 58).

⁶ The suggested sulphur limit for 2000 was 200 ppm.

⁷ However, the Ministers upheld the emission limit values proposed by the Commission.

⁸ If the Council and Parliament fail to reach an agreement after the second reading in the Parliament, a Conciliation Committee (with equal Parliament and Council representation) is established to come to a final agreement.

⁹ One central aspect of this outcome was a mandatory introduction of sulphur-free petrol and diesel for road vehicles from 2009 on.

¹⁰ OATS stands for Olefinic Alkylation of Thiophenic Sulphur.

¹¹ In this connection, ACEA emphasised the positive effects of sulphur-free fuel for the emissions of particulate matter. See ENDS Daily 1999 B.

¹² This was a follow-up of the 'world wide fuel charter' process launched by European and international car manufacturers in the fall of 1998. See previous section.

¹³ Emissions from passenger cars are clearly the most significant source of emissions. With regard to overall emissions from other types of vehicles, emissions were stable or increased slightly during the 1990s. See EEA (2002 B:15, 18).

¹⁴ However, less encouraging trends are noted with regard to CO₂.

¹⁵ According to *Acid News* (2001), 'The Commission's proposals are generally regarded as a gift to the auto makers – forcing the oil companies to invest in extra refining equipment while making it easier for the auto industry to meet the coming exhaust standards and fulfil its promise to the Commission to produce cars with a lower fuel consumption' (No. 2, June 2001, p.10).

¹⁶ Interview with Carlo Cucchi, ACEA, June 17, 2003.

¹⁷ For a general overview of interaction between EU air quality policy and other EU and external processes, see Wettestad and Farmer (2001).

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