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The Public-Policy Interface in Norwegian Science and Technology Policy

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The Public-Policy Interface in Norwegian Science and Technology Policy[1]

1. INTRODUCTION[2]

There is a line, a certain continuity, from the 1960s, when intellectuals and activists pointed out the dangers of pesticides, through the turmoil of the 1970s, dominated by environmental groups, and to the environmental policies of present, heavily marked by the political establishments decree of sustainability. This line has its parallel in the pioneering works of small research institutes giving warnings in the 1960s, the initiation of limited research programs to create technical solutions in the 1970s, and the cross-disciplinary administrative, industrial and scientific innovations in the process and product line of today.

The time from 1960s saw the coming of an ecological discourse, the shaping of new institutions, and consequently the formation of an environmental sector. This was partly the outcome of various initiatives from «below», by subgroups, intellectuals, scientists, environmental organisations and citizen initiatives. Partly it was the result of administrative ambitions to integrate, control or solve new challenging discourses or bottlenecks caused by modernisation.

By the middle of the 1980s environmentalism was integrated and accepted, transformed and adapted, in various disguises. Exaggerating only slightly we could say that ecology was converted from an ideology and a social program to a social, political and cultural commodity. What had earlier been a threat to the order and formalism now become a natural part of the administrative and political establishment.[3]

One central element in this transformation was the building up of expertise in the various movements. Another was the specialisation of tasks and issues inside the movement, which in its turn fragmented the common platform of the movements. The expertise, the specialised issues and the formation of a common language and conception of issues, contributed to the gradual integration of ideas and persons into the establishment.

The price paid was a reconfiguration of ways and means. The new relations to nature through meta-narratives and abstractions has its parallel in the establishment of new types of environmental expertise, as well as a new forms of dealing with the environment as a socially constructed phenomena.[4] At present, highly trained experts of various types, not protesters or the public, dominate the various arenas of the environmental discourse.

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1 This working paper is written as a Norwegian contribution to the EU -TSER - project, Public Engagement and Environmental Science and Technology Policy Options (PESTO).

2 Signy Overbye and Stig Kvaal, STS, have given substantial and very valuable contributions to this article.

3 Andrew Jamison; *The Environmental Movement and Science Policy*, STS working paper no. 19/1996:2

4 Jamison 1996:3

Even if the idea of sustainability is integrated in the political and administrative discourse, the shaping and implementation of more particular measures and not at least the concrete results come only very slowly. While an overreaching national objective throughout the last decade has been the reduction of e.g. the outlet of greenhouse gases, the result has been quite the contrary. In spite of the declaration of Rio, and the urgent need of integrating the public in environmental decision-making, still civic society has limited influence on the way in which sustainability is being carved out. Even if the main political rhetoric of national policy documents stresses the importance of involving these actors, their involvement has only been minor until the present. This confusing situation points at the central questions raised in this article: What does participation in sustainable development mean in Norway?

The reconstitution of environmentalism after 1985 can be described in relation to a wide spectrum of actors, activities, arenas and processes. We will limit our examination by choosing some actors and arenas where the public-policy interface related to environmental science and technology in the years from 1985 until present can be described. This task will be carried out in two stages: First by examining some general trends and examples related to four main policy domains. Secondly we will examine development in one sector, what we may call sustainable transport.

2. POLICY DOMAINS

Resent studies of the development of environmental policies point out the formation of more or less autonomous segments, each with is own environmental apparatus and policies. These segments consist of actors who co-operate and compete with each other and who try to influence the Parliament or the administration.[5]

Instead of the concept segment we have chosen the concept domain, which in a better way underlines the relational and dynamic aspects of these «segments», and at the same time makes it easier to catch some cultural dimensions of national science and technology policy. The point of departure is an understanding of national policy systems in which S&T policy is conceptualised as an arena of interaction between four policy domains or constituencies - economic, bureaucratic, academic, and civic (though not all of these will be properly presented here).

Each domain is represented by its own ideals, goals and policies. The formulation of national goals and aims appear to be dependent on the coexistence and relation between these four main domains and their policy cultures, competing for influence and resources, thus seeking to steer science and technology in certain directions. The domains contain various actors promoting different political and social interests. They also draw on different sets of institutions and traditions, with their particular doctrines, ideologies and ideals of science. Further-

5 Jan Erling Klausen and Hilmar Rommetvedt (eds.); *Miljøpolitikk, organisasjonene, Stortinget og forvaltningen,* Oslo; Tano Aschehoug 1996.

more each domain maintains its own set of relationships to the political and economic powers.[6]

Finally each domain relates to and is influenced by the public in different ways. In this section we will look at the main actors of each domain, give a brief view of their approaches towards environmental science and technology innovation and the way in which the public participate in it. The interaction between actors in the bureaucratic and civic domains are the main target of this section, but we will also very briefly look at the actors in the academic and economic domains.

2.1 Bureaucratic domain

The bureaucratic domain may be divided into the political institutions and their representatives and the administration and its employees. The political elite acts in relation to a short term horizon because of their dependence on support from voters. The local, regional and central administration, on the other hand, respond to more long term aims and perspectives. This enables, in principle, the administration to take up more fundamental principals, organisational and functional problems and inefficiencies of ecological modernisation. Questions to be raised in this connection is if these ideal types of both groups really fit to present situation, or if the roles of both politicians and the administration are changing in the new ecological regime.

The national, regional and municipal level

At the national level both the administration and the political elite are tuned in to the global and European discourse of policies and measures. In connection with green issues, the members of Parliament are rather active. This active role has until lately been legitimated by a general consensus among politicians and the electorate concerning the importance of solving environmental problems. Even if much of the MPs activities must be regarded as political rhetoric and lip-service, this doesn't differ from the way in which other issues such as the health care system or the situation of the elderly are politically treated.

On the national level the post-World Commission Report (WCR) period has seen the introduction of several new leading policies: The principle of integration was succeed by the precautionary principle, which moved focus from repairing damages to attacking causes. Furthermore complied with the right of people "to know", e.g. information of activities with significant environmental effects should be made public. In addition two other principles have been important: Best available technology and Best available practice. These new policies are clearly con-

6 Aant Elzinga and Andrew Jamison; «Changing Policy Agendas in Science and Technology», in Sheila Jasanoff, Gerald E. Markle, James C. Petersen and Trevor Pinch (eds); *Handbook of Science and Technology Studies,* London, Sage Publications Inc, 1995: 575

strained by national policy no.1: The cost-effectiveness of all solutions. Norwegian industry shall not in any way be harmed.[7]

On the regional and municipal level the connection between decision-makers and the public is more complex. At present some activities are linked to global initiatives such as Agenda 21. In a white paper published in 1996 the Norwegian implementation was exemplified by the Green Cities Programme (MBP) and Environmental protection in local administration (MIK).[8] Even if both fit nicely to the principles of Local Agenda 21 (LA21), they were both started before the Rio meeting.

This fact illustrates another difficulty in addition to the lack of communication between local community and the municipality level, namely the central administration's problems fulfilling their international obligations. Until recently the implementation of LA21 has been a very limited. When the lack of commitment and concrete results was commented by a newspaper in 1994, the government's reply was that no further LA21 achievements were needed because the environmental activities in Norwegian municipalities already had gone beyond developing LA21 plans.[9]

The problems implementing Agenda 21 and the reply from the central authorities highlights two vital characteristics commonly used to describe the Norwegian society: The strong political support for local democracy, and a tradition of extensive participation from voluntary organisations in social processes. Since both are underlined as core elements of LA21, the lack of success making these structures work to the benefits of Norwegian LA21 is a paradox, both in terms of projects that could be counted for, and when it comes to the potential success of "look-a-likes". The local democracy tradition and the position of voluntary organisations should have formed the perfect policy culture and base for the measures called for in Agenda 21.

When it comes to the participation of the voluntary organisation sector in social and political processes, the break in tradition from mass-participation to consultants and elitist «firms» is one explanation for this change. Concerning local self government, this has been secured by several acts, the last one passed in 1993. This act clearly defines the functional division between the state and the municipalities. Local democracy is in other words seen as superior to many other principles. If not stated otherwise by law, the counties and municipalities have a wide authority to create and execute their own policies. This may be another answer to the lack of success implementing LA21, which is done from above by the central administration (Malvik 1997).

The central administration has tried to reduce the municipalities "blocking power" by different methods. One has been the earmarking of funding, the other by inducing new administrative innovations. A combination of these two instruments

7 Alf-Inge Jansen and Oddgeir Osland: "Norway" i Peter Munk Christiansen (ed.): *Governing the environment: Politics, Policy, and organisation in Nordic Countries*, Nord-series: 1996: 188-189

8 *St. prp nr. 1 (1995-96) Miljøverndepartementet*: 13.

9 John Hille: *Den alternative Nasjonalrapporten om Norges oppfølging av Brundtlandkommisjonen og Agenda 21*, FIVH, Oslo 1997:83

is important for central administration to increase environmental efforts on local level. EPM (Environmental packages) and MIK are two such examples.

The altering of roles

In the 1980s environmental questions were of great public interest. During the 1990s these issues gradually lost public as well as political legitimacy and focus. The booming economy and the liberal political climate are two reasons for this decline. Another more important reason may have been the fragmentation, specialisation and technocratic wrapping of issues. In contrast both public and parliamentary debates are related to particular incidents or problems of a dramatic or narrative character. This decrease of public interest was clearly reflected in the general election in 1997 where the two «most green» parties had serious setbacks.[10] In spite of this change of public interest and legitimacy, the relative importance and power of the Parliament in relation to environmental issues has been increasing in the last years. The reason for this paradoxical development is primarily rooted in the higher level of conflict in Parliament and in the altering of roles between Parliament and the central administration.[11]

The bureaucratic domain has traditionally been seen as dominated by the administration and its doctrine of order, planning and formalism. The traditional distribution of roles between Parliament and administration has been that the administration initiates, deliberates and implements decisions. Even if this description, of the role and function of the administration still may hold true to a point, recent studies indicate a change where Parliament takes up tasks that traditionally have been carried out by the central administration.

This altering of roles has also changed the way in which interests are communicated and negotiated. Interest organisations and environmental organisation can no longer rely only on their contacts with the administration; they must approach the Parliament too. The reason for this change is that MPs are seen as an increasingly more important channels for activating decisions and policies. In other words, while the corporate channel has lost importance, the "political channel", e.g. lobbying and direct contacts to the MPs, have been intensified. The other side of the coin is that MPs have become more a more vulnerable targets for media and direct inquiries from environmental organisations.[12]

The relation between the administration and the civic domain is based on the connections to the organised parts of the three other domains. Interest groups, among them the environmental organisations, have a long tradition of approaching the administration, and vice versa. Corporate society in its various forms has been thoroughly analysed and described. Even if environmental organisations never have the same influence on the different ministries as trade associations and the unions, they have held decisive roles in the building up of The Ministry of Environment (MD). During the 1970s and 1980s, both formal and informal

10 There are a green party in Norway, but it is only represented in some municipal assemblies.
11 Klausen and Rommetvedt 1996.
12 Klausen and Rommetvedt 1996: 192-193

contacts and mechanisms of co-operation were built between MD and environmental organisations.

Today MD has contact, more or less directly, with approx. 30 organisations deemed as "environmental organisations". The organisations are linked to the MD in different ways, both as singular organisations and through formalised networks (umbrella organisations). Informal contact has been possible due to blurred boundaries between the administration and the most important environmental organisations. Leading persons in some of the organisations are former civil servants in the MD and vice versa. Central persons thus know each other and each others' working methods, they draw on each others' competence and research. Needs for information, problem solutions and answers are often made through a phone call.

However, while the time until the middle of the 1980s saw the attempt of activists to influence central administration, the period thereafter has been marked by the reverse. The Ministry of Environment (MD) is presently striving to strengthen its connections to various environmental organisations, networks and grassroots efforts. The reason stated by many of the NGOs, however, is that they for their part no longer see this connection as a fruitful way to be heard - given the need for time and personnel to work out their standpoints, and the limited organisational and political results they can achieve through this kind of connections. This also refers to the changing role of Parliament: resources can be better utilised in efforts directed towards parliamentary representatives, as underlined above.

The sector problem

But MD has more problems than the decline of important channels to organised society and the consequent loss of legitimacy. After its start in 1972, the new Ministry had a long establishing phase, trying to find its own space between the other sectors, or, as several voluntary organisations claimed: To find modes of cross-sectorial authority for the MD. It is considered a problem that MD is a rather weak ministry compared to other ministries. Political solutions in areas not defined as environmental questions, tend to "forget" environmental challenges.

Ever since the establishment of MD, there have been discussions on how to deal with "the sector problem". For several years environmentalists argued that the MD had to be a super-ministry which had authority to co-ordinate sector-ministries in environmental matters (consumption and exploitation of natural resources). Other groups however, held the firm opinion that the formation of a strong environmental sector would block the integration of sustainability into other sectors. This dilemma, either being strong enough, e.g. a sector, or having the ability to build up interest and induce policies in other sectors, seems to be a major problem, even today.

This problem was targeted in a parliamentary report from 1988 about Norway's following up of the World Commission report. The report stressed the point of integrating environmental issues into all planning and policy. It also underlined each ministry's responsibility for taking environmental issues into consideration in their activities. One means to achieve this goal has been to force environmental

impact assessments on both planning, budgetary work, sectorial goals and activities.[13]

One of the tools to attain this trans-sectorial objective, was the setting up of a committee consisting of the parliamentary secretaries from relevant ministries. The committee is seen, by civil servants in the MD, as more important than the government when it comes to practical results. This is both because MD is rather weak compared with other ministries, and because changing the way of dealing with environmental concerns demands more time, thinking through and long discussions than the government is able to handle. The committee has also played a major role in creating a "common language" on the administrative level.

Another main purpose for this co-operation, has been to create a common tool for environmental impact assessments in all national planning and estimates/budget work. The background for the implementation of such audits can be linked to the attempt to overcome the priority of policies and principles. Two of the main principles for Norwegian environmental policy are to choose "Best Available Technology" (BAT) and "Best Environmental Practice" (BEP). However, these principles have from the early 1990s been seen as contrary to, and have lost out to, another overall principle: the decisive principle of cost-effectiveness. Even if MD has no direct legal authority over other ministries, its legal authority is based on the right to administer two central laws: The Pollution Control Act and The Planning and Building Act. This authority is restricted in several ways, since each sector ministry can decide whether or not to carry out assessments.[14]

Audits have in recent years been used to overcome the contradiction between these principles. In addition they have been utilised to develop a common way to classify environmental work within all ministries. This way of neutralising problems, also has had the consequence that economists have got a very central role when it comes to sustainable development. The cabinet minister of MD has by the introduction of the «Green book» into the State budget, tried to catch the dragon by its tail, putting price tags on environmental problems. Another interpretation, regarding the strong symbolic value of green politics, is that one might say that the economists within the political system have won the battle of who and how to translate the green wishes into numbers and practical politics, and that the environmental issues have been adapted to financial principles - and not the other way around.

Environmental science and technology policy

Environmental policies are manifested through passing of laws, by planning and by national programmes. When it comes to the relation between participation and the development of environmental science and technology policies the introduction of audits illustrates one path in the translation and rationalisation of social and practical bottlenecks. By the relation to the academic domain and by its utilisation of sci-

13 St.meld. no. 46 (1988-89); *Miljø og utvikling. Norges oppfølging av Verdenskommisjonens rapport.*

14 Jansen and Osland 1996: 204-205

ence and technology, the administration has approached environmental problems in three main ways: First by science's construction of «accurate» and «objective» descriptions of problems. Secondly by «rationalisation» of environmental conflicts by evaluations and elucidation. Thirdly by proposing technical means to solve or overcome environmental problems. We will look at the two first ones, while the third will be treated in the next sections (economic and academic domains).

Scientific definitions of problems have from the very start been the basic rationale of the administration. While, juridical and economical expertise have a long tradition of dominating the ministerial arena, in the post-war period the natural and social sciences came to challenge this dominance. This resulted in the foundation of several research institutes such as: Norwegian Institute for Water Research (NIVA) in 1958, The Norwegian Institute for Transport Economics (TØI) in 1958, The Norwegian Institute for City and Regional Planning (NIBR) in 1964, The Norwegian Institute for Air Research (NILU) in 1969. From the establishment of MD in 1972 until present, these institutes have delivered the data and the questions that should justify new acts, planning projects or environmental programmes. Utilisation of the natural and social sciences has happened in co-operation, but also in conflict with the traditional expertise of administration. While the green book represents a sell out or adaptation to the economists, the institutionalised system of environmental indicators and impact assessments may indicate a battle that has been partly won.

The second type of measures, the rationalisation of problems and conflicts by the various types of scientific expertise, has followed in much of the same path. One instrument of this sorts is the use of investigative committees and commissions. While the most frequent use took place in the 1960s and 1970s, internal commissions took their place in the 1980s.[15] This change can be explained by the formation of an environmental sector, as the sector actors attempted to delimit the influence of outsiders. These outsiders were primarily the expertise of other ministries, secondly the organisations.

In recent years, two new policy instruments have gained increased importance. They are risk and impact assessment and public hearings. At present all projects of any vital public interest have to carry out impact assessments and public hearings. Both are linked to the traditional ways and means, namely the passing of acts and planning. When first passed in 1965, The Building Act (BL), represented a paradigmatic shift, from economical to physical planning in Norway. It was an attempt by the administration to deal with the challenges of centralisation and industrialisation.[16] In the ensuing years, BL was reformulated as The Plan and Building Act (PBL) and revitalised several times according to the shifting needs of administration to deal with the environmental challenges. In the last decade PBL has been used as a means to increase the influence and liabilities of organised society and the general public in relation to the challenges of sustainability. Presently all major planning projects are required to carry out impact assessments and hearings after

15 Jansen and Osland 1996: 206

16 Øyvind Thomassen; Herlege tider. *Norsk fysisk planlegging ca. 1930-1965,* Trondheim; STS-rapport nr. 31, 1997

the directives in PBL.[17] These instrument are most commonly used in relation with plans for the construction of public buildings, railways and highways.

A recent evaluation has identified benefits as well as problems related to the use of such assessments. Assessments and hearings have given civic society better information and have made it easier to get access to projects of importance. While the environmental administration and the organised interests have utilised this access, the general public has not to any extent been activated. One main problem has been that the participators have entered the planning processes too late to have any substantial influence. On the other hand, such hearings have triggered media debates at an earlier stage than previously.[18]

2.2 Economic domain

The economic domain is comprised of the various firms, the associations of trade and industry, the population of labour unions and industry committees. It is further marked by a wide variety of perspectives and initiatives related to the challenge of sustainability. The basic ethos is of course economic growth and further development of business. On the other side, in a time where sustainability have been a common commodity, the antagonism between growth and caring for our environment is no longer clear cut.

Norway, a small country with relatively limited resources and a small market, has in the post-war years increasingly being integrated into, and dependant on, the major trends of world economy. Large companies place an increasing share of their investments in companies abroad. The strong actors of this domain therefor rely as much on the signals from alliance partners and competitors, as on those coming from other domains.

While the time until the middle of the 1980s was marked by little interest from industry, the years thereafter have seen the coming of several new initiatives on a broad spectrum. A central initiative in the first period was a plan the improve the pollution from old industrial sites. Even if industry was part of the formulation of this programme, the driving force was actors from the Civic and the Bureaucratic domains. The State Pollution Control Authority (SFT), The Ministry of Industry and Trade (ID), Treasury (FD) and MD were involved. The industry and trade associations and the labour unions were not involved. Central instruments can be characterised as a combination of carrots and sticks: Subsidised loans and a licence system managed by SFT.

From the middle of the 1980s, and especially in the wake of the World Commission Report (WCR), there was a substantial change. This change had many aspects and included a new set of policies, initiatives and actors. These policies introduced principles such as the moving of responsibilities from SFT to the firms themselves, the so called internal control system. Another new principle was the move of focus from products to process control. A third was the set up of research programmes to develop cleaner technologies that should benefit the en-

17 This change is closely related to administrations attempts to adapt to the directives of EU.
18 *St.meld. no. 29 (1996-97); Regional planlegging og arealpolitikken: 90 -94*

vironment, in addition to Norwegian industry. This merger of possibilities, both higher sales and new jobs, made previously passive actors, the industry, trade associations and the unions, interested partners. A closer description of some of these attempts will be dealt with in next section (Academic domain).

In 1993 EU passed the *Environmental Management and Audit Scheme* (*EMAS*). *EMAS* came to stand up as examples for the Norwegian development of different types of environmental audits which were developed along two lines: The technical environmental analysis, was developed by *The Norwegian Pollution Control Authority (SFT)*, and a "civic" version developed by several actors. The first type started out in a traditional end-of-pipe fashion, by seeking technical improvements in the outlet of pollution, the use of resources and waste treatment. In co-operation with industry, *SFT* developed more comprehensive systems with internal and quality control systems. It was first applied to offshore industry. Later the manuals and experience from off-shore installations gave *SFT* the possibility to develop a system of revisions for all sorts of industry. *EMAS* was from 1995 named: *Regulation for voluntary participation for industrial corporations in a environmental steering and environmental audits*. At present nearly 100 Norwegian firms have been accredited.

The other type had its origin when *EPA*`s manual for waste treatment was translated by the *Østlandsforskning* (*ØF*) on commission of *Confederation of Norwegian Business and Industry (NHO) in 1991*. In 1993 *The Norwegian Research Council* and the research program *KOMTEK* granted money to a project, directed by representative from the municipalities. This gave birth to the project *Environmental audits in the municipalities* started in 1993, and ended in 1996. These audits became one important part of the eco-municipality program. A throughout evaluation of the audits have not been done.[19]

2.3 Academic domain

In 1958 The Norwegian Institute of Water Research (NIVA) was established. A scientific program to monitor and to control all types of pollution was started in 1970. Norway was one of the first countries to identify and approach transfrontier air pollution. During the 1970s and 1980s great efforts were put into monitoring and cleaning technologies. However, compared to other countries, the step from end-of-pipe to clean technology came late and has until recent been of little impact.

The overall picture

In 1992 estimated investments in environmental research were NOK 394 mill. (0,05 % of GNP). Nearly 42 % of these resources came from MD. The increased importance of environmental R&D in recent years is demonstrated by the fact that this amounted to only between 11 and 14 % of MD´s budget in the period

19 Carlo Aall: *Når miljømål møter den kommunale virkeligheten : Erfaringer fra prosjektet Kommunal miljørevisjon*, Kommuneforlaget, Oslo 1996.

from 1977 to 1987.[20] The various sector ministries have been responsible for research within their sectors, while MD has financed projects in different sectors.

The research carried out covered a wide spectrum of task and types of expertise, from the preservation of the cultural heritage to the development of clean technology solutions. The policies developed vary to the same extent. The three major actors of this domain are: The universities, state financed research institutes and industrial research institutes. While the two first ideally are guarded by the ethos of enlightenment, the last one is more attuned to the needs of business. Such a picture is of course too simple, all three types operate according to their scientific ideals as well as to the demands of the "markets", the economic, the administrative and the scientific.

While the university sector has been rather open to signals, both from environmental organisations, public opinion and the changing agendas of the political elite, the state financed research institutes have been more closely connected to the horizon of their principals and funding partners, the sector ministries. The private research institutes have been guided by the changing policies of their owners which have been the major corporations and to the economic domain a whole. But since the major portion of Norwegian basic and applied R&D until recently has been paid for by the state, various national objectives have to a large extent decided the speed and direction of the state research institute sector and the universities, as well as the industrial research institutes.

NTNF - one example

A good illustration of recent trends of environmental science and technology, is the changes that have taken place with The Norwegian Council for Research (NFR), and one of its predecessors, The Norwegian Council for Industrial Research (NTNF). In 1989, NTNF, pushed by its principals, decided to focus on clean technology as a new arena of national importance. Clean technology programs were at that time common in Denmark, Germany and The Netherlands. There were two main aims: To develop environmental technology that could be the basis for economic growth. In addition, new technology should meet the demands of sustainability.[21]

This major program, a redefinition of national aims and policies, and industrial necessities were finalised in 1992. While NTNF granted 50 mill NOK, industry contributed with at least 80 mill NOK. In the program the phrase "more than expected" underlines two points: One is the important shift in industry's commitment to front the challenges raised by the message of sustainability. Secondly it indicates a move from a supply side to market oriented policies on behalf of industry.

The majority of new projects concerned environmental surveillance and the development of technologies for clean fjords and seas. These projects were a continuation of earlier research projects, especially in the IT-sector. Projects related to off-shore industry and fish farming, which had appeared most promising in the out-

20 Jansen and Osland 1996: 220

21 *NOU 1996: 23 Konkurranse, kompetanse og miljø*, 191.

set, became less important. The off-shore industry closed off for external firms, developing their own systems integrated in the construction of their machinery. When it came to fish-farming, the economy of this sector was too poor to contribute.[22]

In 1992 three new projects were started. These were EKSPOMIL (Export oriented environmental technology), FORFOR (Research for the process industry) and KOMTEK (Municipal efficiency and sustainable development). These three programs illustrate important aspects and the profile of the early 1990s environmental research programs: The interest in making clean technology a new export-industry (EKSPOMIL), the obvious need to improve Norway's main polluter, the process industry (FORFOR), and the close connection between the new focus set on local community as a problem and potential for carrying out national environmental policies (KOMTEK).[23]

When the programs were evaluated in 1995 the necessity to further the integration between the development of clean technology and other research programs and projects was especially stressed. This point underlines a gradual transformation from a narrow clean technology focus, to what we may call comprehensive "clean society" programs. One example is the new emphasis on industrial ecology and on product cycle improvements.

Recent trends of this sector are marked by the attempts to merge different disciplines and subjects. A strong signal in that direction was when in 1993 all research councils were merged into one main council. All state financed research programs are presently directed by The Norwegian Research Council (NFR). The merger must, in addition to the organisational and economic arguments, be seen as an answer to the growing administrative, industrial and scientific awareness regarding the cross-disciplinary nature of tasks building a sustainable society.

Research specialities that traditionally have been operated separately, are now attempted linked together. NFR has presently five main programmes, each of which with its own research speciality. One of these five programmes, Environment and development, is the main source of financial support for "environmental R&D, from historical studies to the development of clean technology. Even if the range of programs are expanded, the major bulk of resources are channelled towards two areas: The implementation of administrative innovations related to sustainable development, and R&D connected to clean technology.

In addition to the weight on trans-sector and cross-disiplinary co-operation, the present policy is in major parts the prolongation of earlier principles: The need to combine environmental goals and economical goals. This is not especially surprising, since this really is what sustainability is all about. In the same way as the white papers of the late 1980s, a white paper from 1997, *Environmental policies for a sustainable future*, stresses national strategy no. 1, to combine development of industry and trade with reducing the strains on the environment.[24]

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22 Program for Miljøteknologi: Norges Teknisk-naturvitenskapelige forskningsråd, Sluttrapport, 1991.

23 *NOU 1996: 23 Konkurranse, kompetanse og miljø*, 192.

24 Stortingsmelding *no. 58 (1996-1997) Miljøvernpolitikk for en bærekraftig utvikling:* 30

2.4 Civic domain

The Civic domain can be described according to two ideal types of participants, the general public and environmental organisations. Since many of the participants in citizen initiatives also are members of environmental organisations, there is a considerable overlap between the views and functions of these two types of participants. Traditionally this domain has been marked by the ethos of participation and democracy.

The general public

One interesting feature of this domain is the decrease of public interest and activities related to environmental issues. They no longer have the same public appeal or place on the political agenda as in earlier periods. A recent report shows that the willingness to reduce consumption has, in the course of only few years, decreased substantially. Also newspapers find these issues to have less appeal, unless they are connected to major events, catastrophes or international meetings. Norway is also at the bottom end in a ranking of European countries considering the extent to which household sorting of waste had been implemented.[25]

The general public interacts with the other domains in a variety of ways: through formal political institutions, in informal actions and as experts in all sectors. They also represent themselves as consumers, the peoples voice, media and as family members of influential actors. The broad and many-sided presence of the general public makes it difficult to consider their importance in other ways than via references to them by other actors.

At first glance the relation between public participation and the development of science and technology policy at the local community level appears only too distant. But if we look beyond the "banality" of local community experiments, the story could be a little different. An ongoing experiment will illustrate what we are getting at. The Environmental Home Guard (MHV) was established in 1990 by The Norwegian Society for the Conservation of Nature (NNV) and Forum for Environment and Development (ForUM). MHV, presently funded by the Ministry of Environment, are calling people for «dugnad" (voluntary community work). MHV is an umbrella organisation, gathering 15 organisations (not only environmental organisations).

The dugnad is meant to include all sorts of people, not only those with high levels of education. Furthermore MHV has participants, not members. People are expected to carry out tasks, not pay for a membership. The main idea is to motivate many people to alter some habits, instead of trying to get a few people to change all their habits. Through newsletters, and network activities, participants are requested to focus on specific topics at the local and individual level. MHV has produced several workbooks on baby care, techniques for home composting, practical infor-

25 *Adresseavisen* 03.12.97: «We car less for the environment», The article reefers Randi Lavik, and a recent report by SIFO.

mation on waste separation and recycling etc. These books are meant for individual participants as well as for groups of participants like schools, offices and organisations.

One example that MHV emphasises, is the connection between the high level of consumption and pollution. The consumer strategy of MHV, is for people to reduce their general level of consumption. This approach is quite different compared to what has characterised most other environmental organisations, who have been focusing on industry and the emission of harmful substances during the production processes. MHV claims that polluting substances follow the products themselves through the factory gates, not least in terms of the amount of packaging. To help the participants, the MHV in co-operation with the NNV has developed a special checklist for grocery products.

Another central feature is MHV attempts to be a network for knowledge production and diffusion. Special books and courses train the participants how to deal with the administration and with local firms. This training focuses on how to use formal channels as well as the media. The importance of the network activities is underlined by the fact that the umbrella organisation has formal contacts with 15 of Norway's biggest organisations. Through these organisations, information channels and networks, combined with specially trained MHV contact persons within each organisation, a lot of people are connected, influenced and trained.

The importance of this type of participatory experiment which covers a wide variety of other tasks, may look banal. What makes MHV differ from similar attempts, is the connection between simple tasks that can be accomplished rather easily, with similar understandable networking activities. People are not only taught, they are connected to others in the same situation. In other words: We see people sorting their waste, but we also see them sorting their conceptions. People make order of their everyday lives, organise their neighbourhoods, but they also direct huge firms and develop national policies. Even if the home-yard activities seem to be of little importance compared with the sweeping effects of industrial transformation, there is, in the light of the political liberal climate, no doubt that such local community activities, represent an important resource for a more extensive use of public learning in the future.

More certain are the relations between the citizen and the consumer. Eco-labelling is only one example which illustrates the linkages between business strategies and the shifting demands of the consumer. Since about 30 % of the population in some municipalities now belong to MHV, this type of experiment actualises the possibilities, not only for changes in the innovation and development line, but also on the central and local administrative level. For the MHV activists, it is regarded as a problem that the municipalities are too bureaucratic and too little concerned with the changing daily life practices of the general public. From MHV´s point of view, the potential of co-operating with the public to attain important environmental objectives is underestimated by business as well as the authorities.[26]

26 Interview with MHV county leader, Sør Trøndelag , Per Bjørnar Knudsen, Trondheim, October the 9, 1996.

MHV is one of seven networks, or umbrella organisations, concerned with environmental issues. The others are:

1) Liaison committee for nature conservation issues (SRN, 4 organisations)

2) Joint organisation for outdoor life (FRIFO, 12 org.)

3) Liaison committee for preservation of biological diversity (SABIMA, 8 org.)

4) Joint organisation for protection of culture (KORG, 13 org.)

5) Action for Neighbourhood and Traffic (ANT, 9 org.)

6) Norwegian Forum for Environment and Development (ForUM, 57 org.)[27]

Through these networks, several voluntary organisations (environmental and others) have an institutional co-operation which also functions as a channel from the organisations to the government (and, perhaps to some extent the other way around). The activities and power of these networks differ from each other, but they can all be seen as an expression for the wish for co-operation as well as the need for collecting common knowledge and channels for influence on environmental policy. On the other hand, this kind of voluntary work has little to do with mass mobilisation, which has been seen as one of the positive forces of the NGOs in democracy. In this way, the new networks can be interpreted as both a cause and effect of the development towards more bureaucratic organisations.

Environmental organisations

When it comes to singular environmental organisations the picture is easier to draw. Even if the population of different organisations is a heterogeneous one, it is possible to draw up some main categories. Most of the new organisations from the 1980s and onwards can, despite differences, be classified as one group of organisations as opposed to older organisations, either these are classical, old organisations or the alternative life-style-organisations from the 1970s. To classify organisations after period of establishment is nothing new.[28]

The classical organisations have been seen as organisations established before the end of the 1960s. Typical of such organisations are their democratic structure and pragmatic way of working. The new organisations from the 1970s, were more concerned with ecological and ideological challenges in western societies, due to life-style and economic growth. From the mid-1980s, there were established new organisations of a third type, with characteristics different from the already existing ones.

The environmental voluntary organisations in Norway have gone through different phases the last decades. As in many other countries, environmental issues were set on the agenda from the late 1960s, and several organisations were established during the first years of the 1970s. The period from 1970-75 has been called The golden era of environmental protection in Norway, because of the increasing

27 Miljøverndepartementet; "Oversikt over frivillige miljøvernorganisasjoner og deres nettverk", 01.09.1996.

28 See e.g. Stinchcombe; «Social structure and organizations», in J.G. March (ed.); *Handbook of Organizations,* Chicago 1965.

interest in and organising around environmental issues.[29] Also during the 1980s the organisations were quite strong, with an increasing number of members and a new interest in environmental issues in the last part of the decade.

NGO leaders are presently having trouble maintaining interest in and private membership of their organisations. Now there is a heavy public administration on all levels in the society, which has "adopted" the environmental work, while the environmental organisations have weakened, and have problems with finding their own function in a society where their tasks have become "mainstream policy". One element in this new function have been the possibility to adjust to different segments in different ways.[30]

This lack of «somebody below» to diffuse ideas and activate local interest can be linked to another recent feature. New and different organisations have moved into the environmental field.

Some of the characteristics of the new (also called new-liberal) organisations in Norway are that they seem less ideologically bounded, and more concerned with pragmatic solutions and modes of working; this means that most of them cannot be placed within the left-wing, system-critical tradition. They are less concerned with state politics and administration, and are more oriented towards the market (industry, trade). These changes can to some extent explain why environmental knowledge and expertise seems more important to both young and older organisations than earlier. Many of the new organisations are not built upon democratic principles, but are dependent on gifts and supporters. This makes them less vulnerable to the general trend that (environmental) organisations are losing members. Because of the status environmental concern has got in the society as a whole, it seems more important to find its own profile among the other NGOs. In other words, the voluntary sector is more marked by a competition between the different organisations. This may be one of the reasons why media attention seems even more important than earlier. Further, there seems to be a development towards more financial support from the state to projects and activities than to the organising expenses, which favour the small, flexible and pragmatic organisations.

The list can be added with more characteristics. And, of course, the field is marked by more variety than this list shows. The older organisations still play an important role, and have met the new challenges in different ways. This means that period of establishment should not be seen as static characteristics. The environmental field has in many ways become a market with a wide array of different actors and actions.

One example of a traditional organisation is "Fremtiden i våre hender" (FIVH, The future in our hands) established in 1974. More than any other NGOs, FIVH has a strong ideological profile, a typical phenomenon of the 1970s - but not of the 1990s. The ideology of FIVH can be termed "limits to growth". Opinion influence is also seen to be the most important task for the organisation. FIVH has, like most of the NGOs, experienced a decrease in number of members the last years, but has

29 Bredo Berntsen; *Grønne Linjer. Natur- og miljøvernets historie i Norge,* Oslo; Grøndahl Dreyer/Norges Naturvernforbund 1994: 157

30 Klausen and Rommetvedt 1996

presently about 16.000 members. Subscriptions account for more than 80% to their income. Public financial support (from the Ministry of environment) amounts less than 15% to their income.[31] The secretary is rather small, with 2 to 3 employed persons. Despite these quite limited resources, FIVH has its own research institute with 3-4 persons. FIVH has also initiated the establishment of *NorWatch*, an institute for watching and controlling Norwegian firms' activities in the 3rd world.

The ideological perspectives of FIVH calls for a high profile in the public sphere. Media attention is seen as one important way to influence on the public opinion. Because of the limited resources, FIVH pays less attention to political decision-making than many of the other NGOs, and they usually don't use their rights as a body entitled to comment. The way in which FIVH seeks influence in politics, is, in addition to the kick-offs through media, through dispersion of their reports and elucidation. One of their best known projects is the one carrying out ideas on how working hours can be reduced with partial wage cuts.[32] This work was done in co-operation with the research group Alternativ Framtid (now ProSus). Through their elucidation and report series, FIVH wants to, and to some extent success in participating in the public discourse. We therefore notice the focal passage is named knowledge production; the combination of dealing with research results and political solutions.

Bellona and Greenpeace are the most well-known young environmental organisations in Norway. Both were established in the 1980s, they are based on financial support from persons and organisations, but are not democratic organisations since their supporters don't have access to political and organising influence through their support. Bellona for its part, represents the new kinds of co-operation, networks and policy-making, both between the NGOs and politicians/bureaucracy, and between NGOs and industry. Such co-operation takes place both in formal and informal ways.

Bellona was founded by two former members of "Natur og ungdom" (NU, Nature and Youth) in 1986. The leaders, Rune Haaland and Frederic Hauge, often appeared in the media because of their actions against Norwegian industrial firms. During actions against the firm Titania in Jøssingfjorden, they co-operated with the Danish Greenpeace.[33] Hauge and Haaland wanted a new organisation because they found the one they belonged to too big, inflexible and ineffective to deal with the shifting challenges. Through the first years Bellona got a lot of media attention, where they left an impression of being a new generation of idealistic and activist youths, doing everything to expose how industrialists polluted air and water. During the 1990s their profile changed. They are no longer concerned with actions to get domestic public attendance, though they still take actions to discover and inves-

31 Numbers given by Steinar Lem. Interview done 14.10.1996.

32 Tor Traasdahl and Steinar Johannessen; *6-timersdagen med delvis lønnskompensasjon. Et virkemiddel for sysselsetting, miljø og utjevning,* FIVH-report no. 6/1993.

33 Thomas Dahl: *Ordering nature: Environmentalism as a Cultural Phenomenon,* Trondheim; STS report no. 30, 1996

tigate e.g. industrial pollution.[34] One of their main tasks has become to assist industry with knowledge and practical solutions, so they now act more like a consultant firm, or an environmental competence centre, than a group of rebels - though they don't sell consultant services as such to industry. They define their role to be "competent experts- but non-governmental organisation, co-operating with authorities when found necessary."[35]

The foundation has presently approx. 30 employees, many of them high professionals, and with offices in Oslo, Brussels, Washington, St. Petersburg and Murmansk. Bellona's development towards a professional and consulting role among the environmental movement in Norway, can be traced e.g. by looking at their staff. Among the employees, there are a graduate engineer, a bachelor of commerce, an historian, an anthropologist, a chemist, an engineer of chemistry, a marine biologist, a nuclear physicist - among others. One of Bellona's aims is to gather information on a high level of precision, i.e. to be able to present concrete solutions including calculated costs.

Heavy actors' reliance on Bellona in the environmental field can be illustrated by the fact that large firms and the Ministry of Foreign Affairs are their most important financial resources. Today there are about 1500 supporting "members" of Bellona. Contrary to e.g. Greenpeace, Bellona has got access to influential arenas despite of their rather low number of "members". They get financial support from the Ministry of foreign affairs, approx. 4,4 mill. NOK in 1996. The main financial basis, however, is corporations, which represent more than the half of Bellona's income.[36] The way in which the firms give support is primarily through advertising in "Bellona magazine".

As distinct from most environmental organisations, Bellona´s activities are mainly related to technological and industrial solutions. Even if they deny being a representative of end-of-pipe-solutions, Bellona must contrary to FIVH be regarded technological optimists. Development of new clean technologies, such as the electric car, is seen as a fruitful way of dealing with environmental problems.[37] Bellona seeks power where they mean "real power" is to be found, i.e. among industry. According to these activists, here are money and possibilities, here are the worst polluters, and thus a possibility to achieve concrete practical results. Bellona is not represented in any NGO networks. On the other hand they have become rather professional lobbyists on the national, but especially on the international arena. According to the project supervisor, they find it easier to get in touch with the EU commission than with the Norwegian government.

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34 An example of this is the activities carried out in the early phase of the project "Clean Oslo fjord", presented in Bellona facts sheet no. 50, 27.01.97 ("Fjorden full av fat"), Bellona facts sheet no.50, 18.02.1997 ("Prosjekt ren Oslofjord") and the project discription with the same title dated 30.01.1997

35 Interview with Rune Haaland 12.03.1997.

36 Figures given by Rune Haaland during interview 12.03.1997.

37 Kristin Strømsnes and Per Selle (eds.); *Miljøvernpolitikk og miljøvernorganisering mot år 2000,* Oslo; Tano-Aschehoug 1996

The leaders of Bellona want a small and flexible organisation to deal with different and changing challenges. They like round table talks where there are no opposite parts; where it is possible to talk things over and find common solutions. Their consensus seeking strategy has led to establishment of so-called "reference groups" for their various preferential issues. For instance, within their "strategic plan 1996-2006" they have a "programme for cleaner energy" (which is supported by the Norwegian company Statoil with NOK 700.000). They have also approached large firms such as Shell, Statoil, BP and Alcatel participate. Reference groups like this have several purposes: Bellona gets information on what is going on in industry, and get confirmations that their own material is correct. These groups also function to establish and maintain personal relations, although on a professional level, with experts from the companies. These relations lead to better access to further information, and even professional services, from the firms' experts to Bellona also outside the group meetings.

Even if Bellona is only one of several new environmental organisations, this structure and style of activities illustrates some main trends concerning the way in which these new organisations are organised and act: They are less ideologically bounded, and more pragmatic concerning solutions and modes of work. Furthermore these organisations are less concerned with state politics and administration, more oriented towards the market. A third general trend is that they do not always prefer democratic principles and are often dependent on gifts and supporters. Because of a situation where environmentalism is a commodity, they have to carve out niches and construct distinct profiles in a voluntary market with competition between the different organisations. They get an increasing part of their financial support from the state for projects and activities, not for organising expenses. This calls for «firms» that are small and flexible. Their relations to environmental science and technology vary according to which niches they belong to.

A central point is whether the organisations of the new environmentalism can be regarded as important knowledge producing units. These impressions may be discussed from various points of view. But we would rather define them as a filter between science/knowledge on the one hand, and the general public, industry and/or authorities on the other. This point of view does not consider their role as a value-free or passive one; they certainly produce, or construct, new lines between known material. The filter metaphor is meant to illustrate the borderline between scientific knowledge and political action.

NGOs play an important role in building and presenting competence and knowledge, but their function is even more important when it comes to "translating" knowledge into practical answers. They order and simplify the former - and present the latter. And, after all, this appears to be the major aim most places: To find concrete achievable solutions when ecological and environmental knowledge looks like an impenetrable jungle. This appears to be the main task for most NGOs, either the recipient of their information is the general public, the politicians, the civil servants or the industry.

Thus the NGOs are connected to and interact with both the economic and the bureaucratic domain, while their roles in relation to the academic domain are less

clear. The NGOs don't function as contractors to the academic domain, as they do to the other relevant domains, but they still open opportunities for scientists in different ways. On the one hand they are often more successful than the scientists themselves in "translating" scientific results into practical suggestions and solutions that are sought after by other groups. Much of the outcome from research so to speak depends on having organisations make them political issues. On the other hand, the organisations represent an opportunity for the scientists themselves to work politically for certain solutions, either this is by voluntary work or by employment in the organisations. Through this channel the scientists have got the possibility to use and make their environmental knowledge to current political questions; where they otherwise are forced to be "scientifically correct".

Although environmental concern has been heavily institutionalised the last decades, the NGOs are still considered important. Their legitimising function as co-operators, both to industry and the administration, should not be underestimated. At the same time it has become less clear who these organisations are representing. This is of course most obvious with the new non-democratic organisations, but is also a question for the older organisations who face a decrease in both number of members, local groups and activity among their members. The NGO's role as a representative of democracy is thus becoming a bit problematic. It is discussed, however, whether we should see the new roles of NGOs and membership as a tendency towards a decrease of democracy, or as a transformation process where the democratic system gets new modes and functions.[38]

3. SUSTAINABLE TRANSPORT

Most European countries are facing the same dilemma. On the one hand there is a pressing need for more effective transport systems to keep social life, industry and trade going. On the other, environmental problems caused by transport are visible and increasing. *The Future development of the common transport policy, A global approach to the construction of a Community framework for sustainable mobility* states that major environmental problems are caused by transport.[39] A rapport made by the Norwegian Institute of Transport Economics (TØI), contains much the same problem definition: Pollution to air and water, the use of energy and free space, barriers between and division of areas, encroachment of the rural landscape and cities, and encroachment in the natural environment and outdoor life.[40] In this last section we will look at the development in one sector, the communication-, the highways- or transport sector. This sector has traditionally been regarded very

38 See e.g. *Politica no. 1-1997,* where this approach is one of the main issues.

39 Commission of the European Communities: *The Future development of the common transport policy, A global approach to the construction of a Community framework for sustainable mobility*, Bulletin of the European Communities 3/93: 34-35

40 Guro Berge, Øystein Engebretsen, Randi Hjorthol, Trond Jensen og Inger Spangen: *Bærekraftig og miljøtilpasset transport - noen ulike definisjoner*, Arbeidsdokument TP/0925/95, 0-2135, Scenarier for et miljøvennlig og bærekraftig transportsystem, Oslo 4.12.95.

closed for outsiders and containing a high level of conflict. In addition, not only huge financial resources, but also important social and environmental interests are tied to this sector. Inside this sector or segment, the cleavage between environmental and highway interests is much stronger than in any other sector. [41]

The problems

In a white paper from 1988, the problems caused by transport are stated as follows:

> *"Nearly 300 000 persons are living in areas where air pollution is well above internationally recommended standards. Cars are the heaviest contributor to this situation, especially in our cities".*[42]

Nearly ten years later, one could read the following in a Parliamentary bill from The Ministry of Environment (MD):

> *"In 1994 nearly 660 000 persons were exposed to* NO2 *exceeding recommended values and 700 000 the values for PM10. There have been no evident changes since 1990."*[43]

The description gives a similar picture of the situation, but these time in a more detailed form, with indicators specifying the various components of air pollution. The capability of defining problems more «accurately» thus building expertise are at hand, while the same capacity of defining suitable policies and solving the problems does not seem at hand at all.

The transport sector is without doubt a major contributor to air pollution, which in addition to the global warming, are causing illnesses such as asthma and cancer in the immediate environment. In Norway road transport, the fishing fleet and movable oil rigs produce about 37 per cent of all inland emissions of CO2. Concerning regional pollution, 22 percent of the total SO2 and 66 percent of NOx comes from transport. Road traffic is also the main contributor when it comes to local pollution, particular regarding NOx, CO2 and particles. In spite of a relative decrease of leaded gasoline and NOx, the increased traffic frequency still makes this sector, and cars, the very core of the problems.[44]

The absence of a native automobile industry has not constrained the development of a Norwegian society heavily dependent on cars. If we compare with our Scandinavian neighbours, the density of cars in Norway in 1989 was 2.6 persons per private car. The corresponding figures for Sweden was 2.4, Denmark 3.2 and Finland 2.6. Even if Norway had a lower density than either USA with 1.7 or Germany with 2.1, it is safely placed in the upper level of car-dependent societies.[45] Transport with cars, both for private purposes and for freight, has shown a steady and unquestionable increase throughout the whole post-war period. More interesting though, are the figures for the period after WCR. While the personnel transport

41 Klausen and Rommetvedt 1996: 153

42 St.meld. no. 46 (1988-89): *Miljø og utvikling. Norges oppfølging av verdenskommisjonens rapport*, Oslo 1989, page 95.

43 *Stortingsproposisjon no.1 (1995-96) Miljøverndepartementet*: 72-73.

44 *St.prp. no. 1 (1995-96) Samferdselsdepartementet*: 24.

45 Opplysningsrådet for veitrafikken: *Bil og vei - statistikk 1991*, page 113 and 116.

by car rose by 20 per cent from 1986 to 1996, the use of train, tram and bus (taken together) had no increase in the same period. When it comes to freight, there has been a decease in transport by train by 10 per cent, while lorry freight has risen by 9 per cent in the same period.[46]

The figures uncover a development that is far from what could be called sustainable. This development has been prolonged in «the regime of sustainability». The entrenchment of cars into all levels and sectors of society has created a situation that appears difficult to alter. Different concepts have been used to describe status quo. One way is to look at «automobility» as a system which has reached a high grade of maturity. Such concepts illustrate the main problem, the rigidity and the momentum, but leave out human agency and the free choice of people. People were not seduced or forced into a population of car-addicts. The present car-based transport system was not thrown upon us by some others. It was shaped and reshaped by users, businesses, experts and decision-makers. The same actors are presently unable to «rebuild» or reopen the «system», and to create more sustainable transport solutions.

Even if many environmental problems must be linked to the widespread and intensive use of cars, the car represents not only a problem. It is sometimes too easy to forget that the private car offers a highly flexible, useful and democratic means of transport for the general public, industry and trade. In addition, the car is a desirable object in symbolic terms and as a commodity. Norwegian authorities are in other words confronted by the same dilemmas, trying to give form to its policies, as e.g. Swedish and French authorities. The car, as the core of transport, is both a problem and a benefit.

The origin and development of mass-motorisation has been analysed and described in various ways. It has been described in local and international terms, according to causes and effects, as an industry, in relation to social and cultural changes, in terms of transport policies, highway construction, the professions, and the transformations of cities. The list could be extended indefinitely. The dangerous and harmful effects of car transport are documented through a series of studies, and the main bulk of these studies deal with economical or technical aspects of transport and car use. In addition to an emphasis on technical and economical factors, many transport studies have focused on the functional and economical sides of car use and ownership.

The use of cars as well as studies of consequences have been explained according to factors such as time, costs, speed and queues. This rather narrow way of understanding the past, present and future situation has marked white papers as well as scientific reports. Recent studies have to some degree tended to move away from techno-economical considerations and towards socio-technical processes, offering new possibilities to approach processes that produce traffic. In spite of the deficiencies pointed at above, the emphasis on techno-economical considerations and the functional sides of car-transport, the produced insights have also resulted in the development of transportation and environmental policies and instruments.

46 Hille 1997

Policies and measures to reduce transport

A major part of these policies have had as their aim to reduce the private use of cars. To reach these goals the most common measures have been taxes on ownership, on sales, on petrol and on usage of road tolls. In addition, policies are increasingly being developed to reduce air pollution by setting emission standards. Presently SFT is forcing the same type of pollution monitoring and control that previously has been used for industry. General taxation and more targeted taxation such as (toll roads) have brought more money to the Treasury, with no reduction in car uses. One good example is the use of toll roads to the major cities. This system was introduced as a means to reduce the number of people entering the cities by private cars. At present the arguments are turned away from environmental benefits towards the worries of this income source getting too small to finance more road building.

One obvious conclusion is that the car in Norway has to a great extent been a abundant resource for the Treasury to get money for other important political goals. Even if there is an ensemble of policy instruments designed for transport, most of these instruments have not primarily been developed for environmental aims. In spite of this fact, some of them could have such effects. E.g. The Road Act is rather ambiguous concerning its environmental objectives. On the one hand it is meant to impose effective and rational transport solutions. On the other it can be used to reduce noise and pollution from transport. The Road Traffic Act has a more narrow objective, setting the standards for the amount of noise and exhaust allowed.[47]

Presently, policies enforcing technical improvements have been more successful, than economical means. This statement has several implications. While the set up and use of economical regulations can be done by Norwegian authorities, the development of the technical features of cars are done by the international car industry. With only a limited share of the international car market, the ability to influence the manufacturers to produce cleaner cars is limited. On the other hand, standards presented by the pollution control agencies, in a very concrete way, set limitations to the design of the car. One more interesting solution has been the way in which heavily populated areas are designed and planned. The extensive use of speed-bumps, city-courtyards and «zigzagging» lanes reduce transport intensity in these areas.

In spite of its limited success, economical taxation is a frequent and increasingly utilised policy instrument. The taxation of leaded petrol, the CO2 charge, the duty on diesel in addition to a variety of other taxes have had a strong growth in the last years.[48] The heavy taxation has caused a series of debates, not so much because of their hitherto seemingly uselessness, but more related to questions of equality. While income taxes are progressive, transport taxation is flat. The paradoxical

47 Jansen and Osland 1997

48 *NOU 1996: 9 Grønne skatter-en politikk for bedre miljø og høy sysselsetting.*; Jansen and Osland 1996: 238.

situation is illustrated by the fact that the same persons criticise taxation, bad roads, as well as the environmental burdens of car transport.

In addition there have been conflicts related to who shall have the incomes: the counties or the Treasury. Presently there has been a strike carried out by lorry owners to reduce the taxation. The strike has made the Parliament change their mind concerning a further increase in taxation. All in all the taxation has made it economical feasible to build even more and better roads in Norway, thus promoting road transport!

In addition to taxes and standards, there have been serious attempts to improve the position and use of collective transport services. Between 1991 and 1993 The Ministry of Transport (SD) and MD spent nearly 500 mill. NOK on projects to improve the public supply of collective transport services. The projects caused a increased use of these services when pedestrians and bicyclist started to go by bus or city trains instead of walking or using their bikes. On the other hand there was no decrease in the use of private cars that could be related to the improved support of collective transport services.[49] The use of taxation, emission standards and the attempt to seduce drivers to go by bus instead of cars depicts the problems and the complexity of creating more sustainable transport solutions.

In Norway the construction of all types of infra-structure is both difficult and costly because of the natural barriers such as deep fjords and steep mountains. The construction of railway lines and roads demands substantial economic costs. This problem is added to by the spatial distribution of the Norwegian population. There are some large cities, but quite a large portion of the 4 million people in our country are scattered in relatively small rural communities with long distances between them. The continued existence of these communities is secured through a long line of political consensus. In addition there is a similar consensus regarding an equal supply of services to both the rural and urban society.

Concerning the rural part of Norway, the car is essential to keeping the small communities going. Financial restrictions therefore have a much more dramatic and harmful effect in the districts than in the cities, where one type of transport can be exchanged with another type with lower costs. These factors makes changes in transport systems in the rural part of Norway very difficult.

On the other hand, the regional and local environmental consequences of transport are less acutely felt in the countryside. If we leave the global problems caused by transport aside, transport as a environmental problem is a city problem. Norwegian cities were to a large extent reshaped in the booming post-war years which also was the golden era of mass motorisation. They were therefore planned for people travelling with cars.

In addition a Norwegian (maybe) tendency is to have our own detached houses. The one car and one house ideal appears to be an important factor in maintaining a high level of car use. This ideal has also had a strange effect on urban sprawl, and thus on car use. Between 1960 and 1990 the populated areas of the cit-

49 John Hille, Olav Kasin og Helena Nynäs: *Redusert forbruk - kommunal handling: En idekatalog med eksempler fra Norden, Nederland og Tyskland*, Prosjekt Alternativ Framtid, Oslo 1994: 35

ies grew by 170 %, while the population grew by only 27%.[50] Since the cities, by European standards, are small, widespread and with low population density in the suburbs, it is difficult to set up collective transport services and to make these services efficient.

What are the possibilities for change? The communication/transport sector has a tradition for being very closed off and withstanding to external forces. The sector have been dominated by two sorts of world-views or discourses. These are a techno-economic discourse and a land and areas planning discourse. While the techno-economical discourse was the answer from expertise to the early post-war problem, to construct a high-way system fit for the motor-age, the land and area planning discourse was a reflection and a reaction to the problems created by the outcomes of the first discourse.

These two types of expertise and their institutions express the two dominant discourses of the transport field in the post-war era. TØI represents the techno-economical discourse with emphasis on cost-effectiveness and calculation. NIBR represents the physical planning discourse with a focus on spatial planning, using The Planning and Building Act. While the first discourse, definitions and policies considered, works according to use of taxes and subsidies, the second operate in with spatial disposition and land and areas laws, and technical standards as its main elements.

In relation to the first discourse a differentiated taxation of transport according to modes of transport and environmental labels has been the chosen solution. This strategy has variations such as differentiated taxation on traffic "barriers" and on parking. This type of view on shaping more sustainable transport solutions in the future, has had some leeway. The present discussion in media are dominated by a new discussion of introducing a more extensive road pricing system.

The second discourse has recently gained better tools and more influence, through the modernisation of PBL, first in 1985 and later through the revision in 1993. PBL is primarily a tool for the municipality. A new means is the set up of maximum rates for emissions. They will take effect from 2002.[51] In the last revisions of PBL two new elements are integrated: First the role of voluntary organisation as central parties of hearings, secondly a mandate for the central authorities to intervene in local affairs. According to the new line, the central administration can if necessary steer the development of previous undeveloped spaces in connection with tasks of high priority. One ambition for this new policy of intervention is to increase the population density in cities.[52]

Both of these discourses may be termed technocratic for their heavy reliance on professional expertise, and their rather limited interaction with outsiders. Another important aspect is a kind of moving together, or more correctly, forcing together of the two discourses by the initiatives set up by central and local authorities.

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50 Berge et al. 1995: 9.

51 St.prp. no. 1 (1995-96) Samferdselsdepartementet: 24-26.

52 St.meld. no. 31 (1992-93) *Om den regionale planleggingen og arealpolitikken;* Kjell Spigseth og Johan-Ditlef Martens: *Nasjonalt program for utvikling av fem miljøbyer*, Miljøverndepartementet 1995: side 52 ff.; *NOU: 1995:4 Virkemidler i miljøpolitikken*, 54.

Even if this is a description of a development close in time, and at the moment is more theoretical than empirically supported, there seem to be a new way of defining problems and policies.

Two examples - TP10 and «Green Cities Programme»

If we move from the more general viewpoints on transport policy, to present attempts to create more environmentally friendly transport policies, a gradual development from isolated transport solutions, to "whole city solutions" is taking place. Some actors, such as MD want to enforce on the sectored planning system more cross-sectorial and multidisciplinary planning attitudes. To illustrate this development we will look at two different projects: Environmentally Friendly Transport Plans for Larger Cities (TP10) and The Green City Project (MBP).

In 1989 the project Environmentally Friendly Transport Plans for Larger Cities (TP10) was initiated by MD and The Ministry of Communication (SD). Ten cities received money to create new and more co-ordinated plans for their local transport systems. The main argument for the initiative was increasing cost- and capacity problems in the largest cities. The terminology and the definitions depict the central role of technological and economical expertise defining problems. A secondary motivation, stated in the mandate, was the international focus on environmental problems, which illustrates MD's use of international signals to influence other sectors.[53]

The mandate specified quite explicitly that TP10 should be carried out "differently" from earlier projects. Hitherto sectored task and responsibilities, such as the co-ordination of investments and the distribution and use of areas was to be co-ordinated. By bringing together different sorts of professions and including interest organisations and environmental organisations, all types of aspects related to the planning of roads should be considered. A final key difference between TP10 and earlier projects was that environmental considerations were to be treated as a premise, and not as a consequence. The participators were in addition to municipal politicians, the county officials (planning and public transport departments, The County Roads Offices and the County Environmental Departments.[54]

The mandate of TP10 had elements of both the old and the new definition of problems. While the main argument for starting the projects a narrow definition of technical and economical bottlenecks in cities, the methods proposed were distinguished by a conception of complexity, cross-sectoriality and cross-disiplinarity. The forging of levels, positions and professions should in the view of the initiators create a more open planning process. In many ways this was an attempt to break

53 Synnøve Lyssand Larsen m.fl.: "Transportplanarbeidet i de ti største byområdene i Norge - evaluering av prosessen", Samling av foredrag fra seminaret *Bærekraftig transport- og byutvikling*: NTH 6.-8. januar 1993; Kommunenes Sentralforbund: *Miljøvern i kommunene - Eksempler på tiltak*, Oslo: Kommuneforlaget, 1991: 84.

54 Lyssand Larsen m.fl 1993.; Kommunenes Sentralforbund 1991: 84. Tor Lerstang og Morten Stenstadvold: *Mellom fag og politikk - Lokal transportplanlegging i norske byer - Eksempler fra Stavanger, bergen og Tromsø*, TØI-rapport 224/1993: i.

open the transport sector. It was also an attempt to create a new constellation between previously remote actors, thus making weak links, strong ones. It was also, putting it a bit more bluntly, an effort to create new sorts of networks, and possibly weaken the existing ones. TP10 was in addition to an attempt to formulate new policies, and an attempt to force new planning methods into local and regional administration.

The plan was evaluated in 1993. According to the evaluation and as a major conclusion, "the work carried seemed promising". Beneath the rhetoric the main conclusion was that the TP10 projects had not treated environmental consideration as a premise, but as a consequence. In other words, "the promising project" had failed when it came to one of its main aims. According to the evaluation, there were several reasons for this negative result: One was the link between TP10 and central and local highway programs. The projects were expected, correctly or not, to give input to these plans. This meant that projects that were to forge more sustainable transport solutions, were already tied up in the old system. A second problem was the old view that the improvement of roads would benefit to the environment. In this view more environmental friendly cities, meant more environmentally friendly roads, which meant more roads outside the cities. More roads outside the cities meant less pollution in the inner cities, but more regional pollution. In addition better roads, meant better access by car, and in the long term, more transport and pollution. A third factor was the exclusion of collective transport services from the planning processes. To develop a system that did not relate car transport to collective transport was in all respect no step forward.

The evaluation also considered the type of expertise involved in the projects. In other words, had the attempt to create new networks succeeded? According to the evaluation, the main expertise had been engineers. Local politicians and interest organisations had participated only in a very limited way. In addition to their timid participation, they had neither had the power, nor the resources to affect the projects in a substantial way. To some extent, they also held views that did not support environmentalism. A report from TP10 in Drammen exposed serious problems and differences between the various types of expertise and participants. Especially stated were difficulties in getting the "road-people" to accept that also environmental terms should be central in the planning.[55] A last factor, especially underlined in the evaluation, was the connection between the investment in new roads and the financial situation of the municipalities. The primary aim of the local administration was to collect financial resources for to their regions. Supporting more sustainable transport was a question that was treated in separate terms.[56]

In 1992 MD invited the 20 largest cities to apply for a project to develop sustainable municipalities and cities. The Green Cities Project (MBP) started in 1993, with Bergen, Tromsø, Fredrikstad, Kristiansand and one part of Oslo as participators in the project. MBP had, in the same way as TP10, as its main objective to integrate national environmental policies. In addition the mandate stated that a vital goal also was to develop new local policies. MBPs should reduce the use of

55 Kommunenes Sentralforbund 1991: 84.

56 Lyssand Larsen m.fl 1993.; Lerstang og Stenstadvold 1993.

undeveloped space, energy and resources. Furthermore MBPs should protect natural areas and green lungs, create "living" city centres and safer local communities. A central aim was to create environmentally friendly transport solutions..[57]

While TP10 was a project for transport that was meant to draw on other sectors, MBPs were meant to deal with many sectors, and environmental tensions in cities in a broad manner. In this way it should also include transport as one of several elements influencing city development. To reach these goals each participating city was to develop local priorities for sustainable development. They were also to create local plans and concrete projects that could "visualise" long term goals. Again, the need for more cross-disciplinary initiatives was particularly stressed. It was also seen as important that the civil society, represented by voluntary organisations should be integrated in the work. According to the guidelines, new and alternative solutions should give inhabitants "a real possibility" to be environmentally friendly.[58] Since the development of a "better" transport plans were to be central parts of the projects, transport planning was to be co-ordinated with the undeveloped space policy, which (as described above) had gone through substantial changes. This underlines the attempt to join the techno-economical discourse and the land and area planning discourse. A pamphlet from MD, The Ministry of Transport (SD) and SFT, illustrates both this attempt and the built-in tensions in the scenarios for greener cities. Some quotes underlines these tensions:

> *"The design of roads makes you a better motorist. Less car traffic means more effective commercial transport. The incomes increases. Soft road-users do have their own roads."*[59]

A short look at one of these experiments might be useful. «Old Oslo» has traditionally been one of the worst city areas concerning pollution from car traffic. On this background it was picked to participate in the MBP. The inhabitants were invited to meetings, to carry out volunteer work and to be partners in hearings. While representatives from the general public joined in the start, their interest cooled, and the stage was left to experts and civil servants. The problem integrating the public illustrates our main theme. The concrete outcomes of the planning underlines another. One of the projects in Old Oslo was the construction of a tunnel for cars. When finalised, the tunnel contributed to substantially improving the situation for the local inhabitants. However, the overall picture tells of a substantial increase in traffic frequency because of easier access to the city. In other words, more cars, more traffic and more pollution, but not in Old Oslo's «backyard».[60] This problem, both connected to the question of more sustainable transport solutions and to the consequences of public participation, was addressed by professor Arvid Strand at the summarising conference of the MBP in 1995.

57 Spigseth og Martens 1995.

58 Sissel Rubberdt, Kari Viken and Lene Beate Ruud (eds.): *Miljøtilstanden i Norge*, Oslo 1996: 71-74.

59 *MD: Miljøbyen 2005 - Et magasin om hvordan byene våre kan bli hvis hensynet til miljøet får bestemme over trafikken*, Oslo no date.

60 *Samferdsel no. 3*, 1991: 8-9

Strand stated the fact that there never had been a more intensive construction of new highways in Norway than today. Is there, he asked, a solution to problems, to move all transport under mountains? Strand ended his attack by stating that sustainability now had gained the same meaning as: Love, baby and Christmas.

4. ENDING REMARKS

In this article we have examined some aspects of the relation between public participation and environmental science and technology policies. As the reader may have noticed the boundaries between the general environmental policy and the environmental science and technology policy are vague and difficult to draw. Environmental science and technology seem to a great extent to be integrated and framed by general policy-making processes and what is eventually at stake in any particular policy..

Also when it comes to concrete results we will strongly underline a very dim and confusing situation: The messages from the World Commission or The Rio meeting seem well integrated in most white papers and other political documents. Experiments are set up and policies are being formed on different levels and sectors. However the objectives, directions and relations between these experiments vary a lot: Some contain possibilities for social learning and potential for a stronger public involvement, while others are clear cut technocratic and closed off to public scrutiny.

What we have termed environmental S&T seem to be framed by the lack of formal mechanisms through which organised civic interests can participate in core aspects of the policy-making process. One consequence is that actors from the civic domain have to deal with existing and often «closed» agendas. These framings reduce what are complex technical, political and human problems to narrowly defined scientific and administrative issues suited to expert and managerial control. Such reductionists processes exclude or suppress less powerful or less articulated human concerns.