



EVALUATION OF THE DUTCH ECODRIVE PROGRAMME

IN FRAME OF AID-EE PROJECT

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1 Characterization of the instrument

The Dutch Ecodrive programme ‘Het Nieuwe Rijden’ (from hereon “Ecodrive-programme” or “Ecodrive”) is an instrument with the objective of stimulating more energy-efficient purchase- and driving behaviour. The Ecodrive programme is one of the instruments mentioned in the National Climate Change Action Plan (Ministry of Environmental Affairs, 1999) to reduce CO₂ emissions. This Action Plan is introduced in order to reach the targets set in the Kyoto Protocol.

Ecodrive is focused on creating the necessary conditions and organisational structures that facilitate more energy-efficient purchase and driving behaviour, with the objective of reducing CO₂ emissions. It targets individual changing behaviour of car users and fleet owners, which participate on a voluntary basis. Apart from the targets related to CO₂ emission reduction, in its communication the programme emphasises additional advantages of ecodriving such as economic gains, comfort and safety.

In reaching the necessary target groups, the programme collaborates with a large number of network partners, which have endorsed the objectives of the programme, and are intended to use their network to facilitate and strengthen the ambitions of the Ecodrive programme in the Netherlands.

1.1 Targets Ecodrive

The overall objective of Ecodrive is to stimulate individual drivers, professional chauffeurs and fleetowners in more energy-efficient purchase- and driving behaviour, leading to a reduction in CO₂ emissions.

Based on an assessment of improvement potential (Beeldman et al 1999), the programme has set targets to reduce an amount of 0,8 Mton of CO₂ emissions by 2010 annually (Ministry of Environmental Affairs, 1999); 0,5 Mton for in-car devices and drive style changes, and 0,3 Mton via improved tyre pressures. Intermediate goals of 0,4 Mton CO₂ emission reduction was set for 2005 (SenterNovem 2005). In total this is the equivalent of a reduction of the energy consumption of approximately 15 PJ as a result of the Ecodrive programme in 2010.

The total direct CO₂ emissions of the transport sector in the Netherlands add up to 35,2 Mton (2003), with an expected rise to 38,1 Mton in 2010 and 45,8 Mton in

2020. Road transport is the largest contributor with 87%¹ (Van Dril, Elzenga, 2005).

The targeted 0,8 Mton emission reduction in 2010 as a result of the Ecodrive programme therefore translates in a 2,4% of CO₂ emission reduction as a result of road transport in 2010.

The Ecodrive programme contributes 2,0% to the national objectives to reduce CO₂ emissions as a result of the Kyoto protocol (6% reduction in 2010, equivalent to 40 Mton) (Ministry of Environmental Affairs, 1999).

1.2 Period the policy instrument was active

The Ecodrive programme builds on earlier experiences to achieve drive style behaviour changes with a programme called “Koop Zuinig, Rij Zuinig” (“Purchase Economical, Drive Economical”), running in the period 1988-1998.

Under influence of the Kyoto protocol the Ecodrive programme was set up to assure more structural changes to change drive style behaviour (e.g. integration in drive school curricula). Phase 1 of the Ecodrive programme ran between 1999-2005; phase 2 is currently operational (2003-2006²). Recently funding was acquired for phase 3 (2006-2010).

1.3 Specific actions in Ecodrive

The Ecodrive programme covers a large range of activities in order to achieve more efficient driving behaviour. The programme distinguishes five different ‘modules’ of actions with different target groups and related objectives (SenterNovem 2005).

1. Stimulating Ecodrive driving style of (professional) drivers

An important target group of the Ecodrive programme are existing driver’s licence holders and professional drivers. Several specific actions have been taken by the programme, such as the training of instructors in Ecodrive principles (see figure 1), subsidising trainings for groups of (professional) drivers, the development of a drive simulator (used on workshops, conferences), and an extensive media campaigns (television, radio, websites, folders).

2. Integrating Ecodrive principles in driving school curriculum

In order to reach new drivers, the programme has facilitated the training of driving instructors in ecodriving. Ecodrive principles are integrated in regular training programmes for instructors.

¹ Situation 2000 (van Dril and Elzenga, 2005); this includes personal transport (52%) and freight transport (32%): both are targeted in the Ecodrive programme.

² Phase 2 partly overlaps Phase 1.

3. Training new drivers with ecodriving

Ecodrive principles are integrated in the driving school curriculum for new drivers. Ecodriving is now integrated in the theory exam for new drivers; currently it is studied how ecodriving can be integrated in the practical examination.

4. Stimulating in-car devices

In order to stimulate the purchase and use of fuel-saving in-car devices (econometers, cruise control, other feedback systems), the Ecodrive programme has lobbied to achieve tax-incentives for such devices. The tax-exemption has been active from May 2000 until January 2005. Furthermore, the programme has brought the use of in-car devices under the attention via public campaigns and demonstration programs.

5. Facilitating optimal tyre pressures

Increasing awareness to frequently check tyre pressures of current cars, the programme has organized (or subsidized) demonstration or training projects or tyre checks. Furthermore extensive information campaigns (folders, websites) as well and targeted marketing activities (e.g. folders to repair and maintenance shops) were set up. Lastly, the objective of the programme is to get tyre pressure checks integrated in regular maintenance of dealers.

6. Stimulating purchase of more efficient vehicles

No specific programme was set up for purchasing behaviour, given the overlap with the Ecolabeling programme for cars, which is the responsibility of the ministry of Environmental Affairs. Nevertheless, purchase of more efficient vehicles is stimulated by raising awareness in driving school curriculum, drive style trainings and communication campaigns (e.g. website). Effects of these activities have not been attributed to the programme.

Drivestyle recommendations

1. Shift up as soon as possible. For petrol/LPG cars at a maximum of 2,500 RPM, for diesel cars at a maximum of 2,000 RPM.
2. Maintain a steady speed, using the highest gear possible.
3. Look ahead as far as possible and anticipate to surrounding traffic.
4. When you have to slow down or to stop, decelerate smoothly by releasing the accelerator in time, leaving the car in gear.

Additional recommendations

- Switch off the engine at short stops (> 1 minute).
- Check the tire pressure once a month. High tire pressure saves fuel and endures the lifetime of the tire.
- Make use of fuel saving in-car devices (board computers, econometers, cruise control)
- Get rid of surplus weight and not used roof racks.

1.4 Target groups

The target group of the Ecodrive programme are individual (existing and future) drivers, professional drivers, fleetowners. Apart from stimulating license holders, via the driving school curriculum the Ecodrive programme aims at educating future drivers in the Ecodriving principles.

1.5 National context

The Ecodrive programme is part of the national Climate Policy Plan to achieve targets set for the Kyoto protocol. It is an initiative from the Dutch Ministry of Transport in co-operation with the Ministry of Environment.

Related instruments to increase energy efficiency in the transport sector include energy labelling for cars, enforcement of speed limits, and the CO₂ reduction plan (all part of the Climate Policy Plan). The latter programme financially supports large-scale investments with a significant CO₂ emission reduction potential, mainly in the sectors personal transport (e.g. cleaner vehicles, mode shifts, and efficiency improvements) and goods transport.

Instruments under discussion but not executed include a tax scheme based on CO₂ differentiation (to be implemented in 2006) and road-pricing.

1.6 International context

Similar programs like the Dutch Ecodrive programme have been active in other EU member states, particularly Germany, Finland and Switzerland. In 2001 a European project called Ecodriving Europe³ started, aimed at accelerating the establishment of ecodriving across Europe.

Furthermore, on European scale the ACEA covenant provides incentives for the automotive industry to develop cars with reduced CO₂ emissions, by upto 25% in 2008 in comparison to 1995. The covenant is an agreement between the EU and the collective European (ACEA), Japanese (JAMA) and Korean (KAMA) automotive companies⁴.

1.7 Market failures to overcome

The Ecodrive programme aims at overcoming the lack of consumer awareness on the benefits of energy efficient driving. It is based on the assumption that consumer

³ The European Project "Eco-driving" is a project partly financed by the former European energy efficiency programme SAVE; www.ecodrive.org

⁴ See the separate ACEA case study within the AID-EE project carried out by Wuppertal Institute.

awareness is limited concerning the impact of in-car devices, drive style changes and tyre pressures.

1.8 Organisations responsible for implementation and execution

The Ecodrive programme is executed by SenterNovem (Dutch agency for energy and the environment) on behalf of the Dutch Ministry of Transport and in co-operation with the Ministry of Environment.

The programme cooperates with approximately 20 consumer and retail organisations, mainly in the transport and car business. Among these organisations are the Royal Dutch Touring Club (ANWB), the Dutch Consumer Association, the Dutch Bureau for Driver's licenses (CBR), the Dutch branche-organization for entrepreneurs related to mobility (BOVAG), and the Dutch Association of Car Importers (RAI-Association). These organizations cover a vast majority of relevant stakeholders related to curriculum development, in-car devices and branche organizations concerning mobility and car owners.

These organisations have signed a voluntary agreement thereby endorsing the Ecodrive programme. Participation of the organizations are assumed to increase the credibility of the programme, and to reach the relevant target groups.

1.9 Available budget

For EcodriveI (1999-2005) a budget of € 10 million was available; for EcodriveII (2003-2006) the budget was raised to € 15 million. Recently EcodriveIII (2006-2010) has been awarded € 15 million.

Approximately half of the budget is focused on setting up communication campaigns; the remaining half is spread over subsidized projects, contracted projects (e.g. for setting up training structures), and overall project execution costs.

1.10 Expectations concerning cost-efficiency

The programme has based its objectives on the initial assessment of Beeldman et al (1999) according to which 0,8 Mton CO₂ emission reduction could be reached by 2010 as a result of the Ecodrive programme.

The expected cost-efficiency as mentioned in the long range plan 1999-2005 (SenterNovem 1999) was estimated to be € 9 per ton avoided CO₂⁵.

⁵ This assessment was based on a large number of assumptions largely derived from available literature studying the impacts of ecodrive lessons on driving behavior.

1.11 Side effects

Complementary advantages as communicated by the programme include economic gains (reduction of fuelling costs, maintenance costs), increased safety and a reduction of local emissions and noise. Given that these gains are hard to quantify and substantiate, these gains have not been taken into account when dealing with cost-efficiency for the programme.

Although the programme has been set up with the specific objective of reducing CO₂, in its communication to target groups the complementary side effects are emphasised (given that environment-oriented programs are usually not associated with economic opportunities).

2 Policy theory

2.1 Cause-impact relations, indicators and success and failure factors

The following description of policy makers' assumptions concerning the functioning of the instrument Ecodrive can be made. Given that three parallel programme lines can be distinguished (see figure 3):

- A: Development of driving school curriculum to reach new drivers
 - B: Subsidized activities to train existing drivers in Ecodriving
 - C: Communication campaign to raise awareness of existing drivers.
-
- 1 In 1999 the national government introduces the Ecodrive programme, a follow up of the so-called “Koop Zuinig; Rij Zuinig” programme. Execution of the programme is carried out by SenterNovem.
 - 2 SenterNovem involves relevant stakeholders in the automotive sector such as branche-organizations, consumer organizations and organizations related to driving school curricula. The purpose is to get the programme endorsed by a majority of relevant stakeholders, as well raising credibility of the Ecodrive programme to the target group.
 - 3 **A:** SenterNovem, in collaboration with CBR, sets up training structures that provide the necessary conditions for providing training in ecodriving. This involves the training of instructors (“train the trainer”) for practical exams, the set up of a certified system for instructors, the integration of Ecodrive-principles in theory exams, and (in later stages) the set up of rules and examination criteria for practice exams for new drivers.
 - 4 **A:** New licencees take their theory examination in which questions on Ecodrive principles are integrated.
 - 5 **A:** During the practical driving school curriculum instructors facilitate the learning of Ecodrive principles to new drivers in practice.
 - 3 **B:** SenterNovem in collaboration with network partners develop training modules, simulators, and webbased Ecodrive games.
 - 4 **B:** SenterNovem initiates a subsidy programme for ecodrive training. The subsidy programme is intended to lower the barriers for current licensees to get familiar with the principles of ecodriving. The subsidy programme is largely focused on fleet owners and professional drivers, rather than individual drivers, in order to increase the reach.

- 5 **B:** Organizations apply for Ecodrive-grants; ranging from private and public fleet owners, as well as intermediary organizations such as VVCR and subsidy consultants.
- 6 **B:** Instructors train applicants (current license holders) in ecodriving in subsidized programs. Examples include drive style trainings (realtime, simulators), tyre pressure trainings, and information on drive style behaviour, in-car devices and energy efficient cars.
- 3 **C:** SenterNovem, in collaboration with network partners, sets up a broad communication campaign to reach the target groups (radio, newspaper, websites, mobility related television programs). The campaign emphasizes the basic Ecodrive principles (gears, steady speeds, traffic anticipation, tyre pressure, in-car devices).
- 4 **C:** Consumer become aware of the Ecodrive programme and principles.
- 7 Drivers apply gained knowledge of ecodriving on a day-to-day basis..
- 8 Consumer check tyre pressure regularly.
- 9 Drivers purchase energy-efficient in-car devices.
- 10 Drivers shift their purchase behaviour to more energy-efficient vehicle models, for instance by using energylabels for cars.

2.2 Interaction with other policies

The Ecodrive programme interacts with two related policies to increase the energy-efficiency of cars on a consumer level.

First, since 2001 the Dutch government has set up an Energylabel to provide consumers with information on energy use and CO₂ emissions of passenger cars. The label (A-G) is intended to influence consumer behaviour towards purchasing more energy-efficient cars, which also is one of the objectives of the Ecodrive programme. The Energylabel programme does not provide in further incentives, and largely relies on a communication campaign through information panels available at sales points of vehicles.

Second, between May 2000 and January 2005 a national tax exemption scheme was available for the purchase of fuel-saving in-car devices (with rebates of €50-325, dependent on the type of in-car device). The scheme was financed by the Ministry of Finance. Through lobbying activities of members of the Ecodrive programme, it has had influence on the instalment of the tax exemption scheme.

Third, ecodriving will also be dependent on fuel taxation and oil prices.

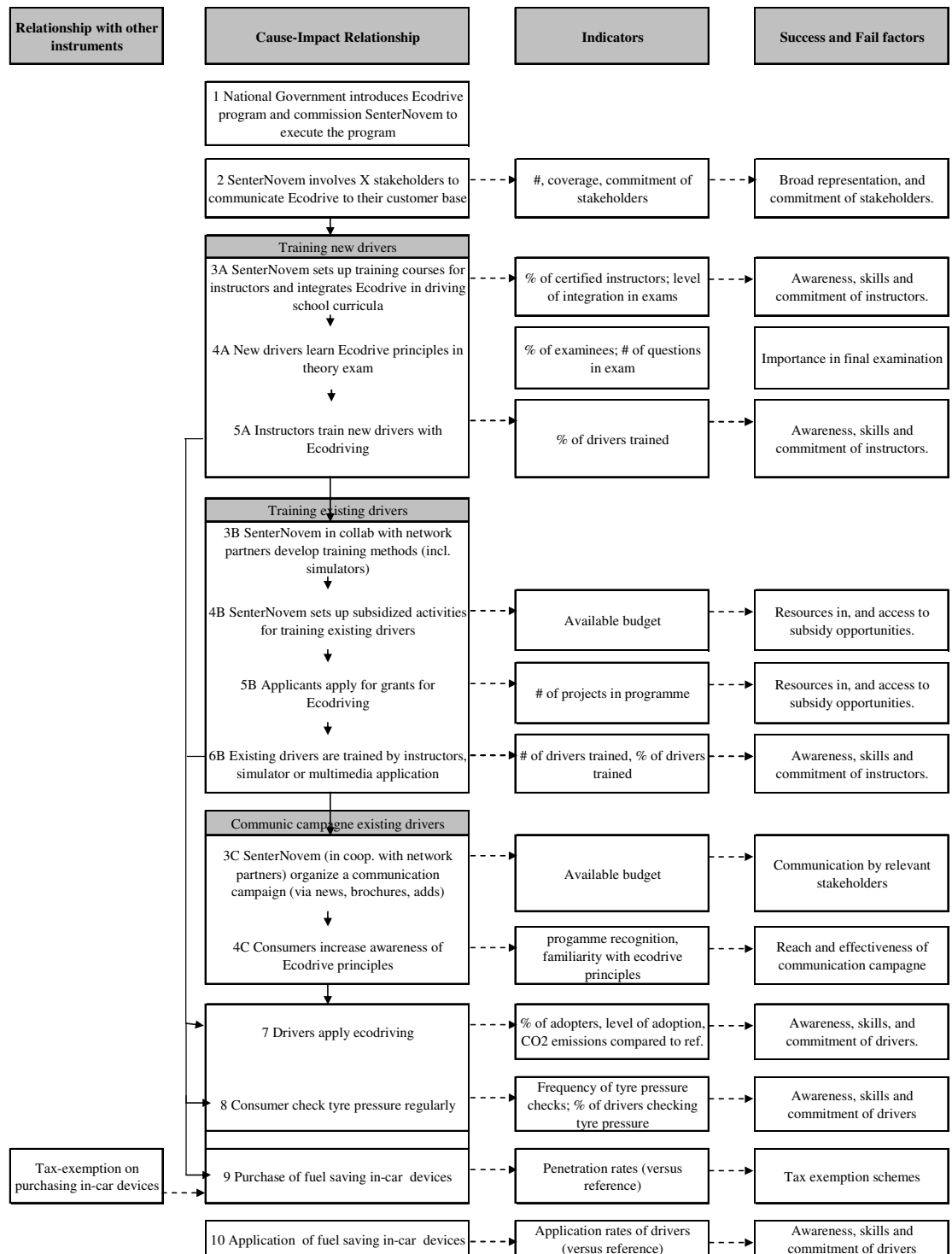


Figure 3 Cause-effect relationships for the Ecodrive programme

3 Evaluation

3.1 Participation of Stakeholders [2]

The involvement and active participation of stakeholders is assumed to be an important supporting factor for the Ecodrive programme. The objective of the Ecodrive programme has been to get the programme endorsed by a majority of relevant stakeholders in the automobility sector, and to stimulate network partners into taking initiatives to promote the Ecodrive principles.

Evaluation

A large number of organizations has indeed endorsed the Ecodrive programme. The list includes consumer organizations, environmental NGOs, branche organizations (e.g. for drivers, vehicle suppliers, entrepreneurs in mobility, logistics companies), tyre suppliers, oil companies, lease companies, and drive training organizations.

The branche-organizations provide a large coverage of relevant stakeholders in the automobility sector. Through the participation of consumer and environmental, as well as training organizations the target groups (drivers) are covered.

The level of participation varies from partner to partner, from endorsing the programme to actively organizing trainings and communicating Ecodriving to its members (SenterNovem interview, 2005). In general however, the interviewees mention that the commitment of most partners is limited, and should be increased to make the programme more successful. Up till now network partners are obliged to make an effort, rather than achieving particular results. Network partners make investments in time rather than out of pocket costs. One of the interviewees mentions a maximum time commitment of 4% per year (<60 hours/year).

The programme has been successful in creating a network of representative stakeholders relevant for bringing Ecodrive to the attention of the enduser (good coverage). Most interviewees agree that a vast majority of relevant partners is participating, and that they play a significant role in providing credibility to the programme's objectives and principles. Available funds (as provided by SenterNovem) for carrying out contracted projects as well as being able to influence policy making were both mentioned as success factors in attracting network partners.

3.2 Train the trainers [3A]

The Ecodrive programme has set the objective that ecodriving is an integral part of the training curriculum of driveschool trainers, and that all drive instructors and examiners are trained in ecodriving by 2005 (Novem 1999). This applies for both instructors for driver's licence holder B and CE.

In total there are 7000 instructors B and 850 instructors CE in the Netherlands (SenterNovem 2005). As a result of training activities for instructors, by 2004 74% of instructors B and 93% of instructors CE have been trained in ecodriving (SenterNovem 2005). According to the interviewees of ANWB and BOVAG (2005) the trainings have been successful in making instructors aware of ecodriving, and that instructors in general seem positive about bringing it into practice with drivers (SenterNovem 2005).

Supported by the participation of relevant network partners, the programme has been successful in training instructors in ecodriving.

3.3 Drive school examination [4A]

The Ecodrive programme has set goals to integrate in ecodriving in drive school curricula with the objective that all new drivers in 2005 are evaluated on ecodriving in the theory and practice examination (Novem 1999).

Since 2001 Ecodrive has been integrated in instruction books and theory exams in the Netherlands, and has thus become a standard criteria for all new driver's licence holders. With the integration in the new drivers (100%) the Ecodrive programme has been effective in training new drivers with Ecodrive in theory, and has reached its goal of 100% coverage.

3.4 New drivers trained [5A]

Based on a questionnaire (Traffic Test, 2002[1], Traffic Test 2002[2]) 92% of the instructors claim that they plan to include Ecodrive in their training for new drivers. Given that in 2004 182.000 drivers B and 10.900 drivers CE are trained, the coverage of new drivers trained in ecodriving is 123.506 drivers B and 9344 drivers CE⁶.

It is assumed that approximately 35% of the new drivers will actually apply ecodriving in daily practice (SenterNovem 2005). Nevertheless limited research is available concerning the extent to which ecodriving principles are (all or partially) interpreted correctly by new drivers, the percentage of Ecodrive suggestions that

⁶ Also based on the percentage of instructors trained in ecodriving – see indicators 2.

new drivers are aware of, and to what extent the Ecodrive routines sink in (on the long run).

Given that ecodriving is not a hard examination criterium in the practice-exam it can be questioned whether 92% of new drivers get acquainted and learn all of the available Ecodrive principles.

3.5 Training structures for existing drivers [3B]

The second line of activities of the Ecodrive programme is focused on reaching existing drivers. Objectives include the training of 10.000 license holders by 2005, and that 100% of all licence holders in 2010 have been trained in ecodriving (Novem 1999).

The training structures have been developed by several of the network partners. Partly these activities are sponsored by executive body SenterNovem; partly several network partners have developed these training structures with own funds, in order to expand their services to drivers. ANWB mentions that these training structures were already largely in place, but where upgraded slightly to take into account the specific principles propagated in the Ecodrive programme (interview 2005).

3.6 Set up of subsidized activities for existing drivers [4B]

In collaboration with several network partners, SenterNovem has set up a range of subsidized activities to train existing drivers. Subsidized activities include drive style trainings on the road, simulators, trainings in tyre checking, and projects related to disseminating an Ecodrive-multimedia game.

Two tenders (2001 and 2003) were set up for projects eligible for subsidy to stimulate Ecodriving (mostly drive style trainings or in-car device integration). Aside from the tenders the Ecodrive programme budget was available for special projects. In total the annual budget for these activities is approximately €1M (SenterNovem 2005).

3.7 Applicants to subsidized activities [5B]

Between 2000 and 2004 more than 100 projects have been contracted by SenterNovem to stimulate ecodriving by existing drivers, approximately 30 of which were carried out as result of the two tender rounds held. A majority of these projects involve drive style trainings (SenterNovem 2005); relatively little projects are related to in-car devices. Participation in subsidized projects required applicants to report on their activities and monitor improvements in fuel usage. Typically fleet owners or large organizations are involved in projects, where consultants with

knowledge of mobility and subsidy schemes coordinate the project, and assists in monitoring and reporting.

3.8 Training of driver's license holders [6B]

In 2004 approximately 75.000 existing drivers were reached: 26.000 via a multimedia game (HNR); 25.000 in tyre pressure trainings; 16.000 in subsidized projects, and more than 8.500 in taxidrivens and other collective transport (SenterNovem 2005). In total the Ecodrive programme has reached more than 150.000 existing drivers via trainings, simulators and the HNR game. Additionally close to 750 chauffeurs of freight transport have been reached in 2004. This represents 1,5% of the total driver population in the Netherlands. The reach of subsidized projects therefore seems limited to cover a large share of existing drivers.

3.9 Communication campaign / programme recognition [3C]

An extensive communication campaign was set up with the objective achieving a 60% programme recognition of all drivers in the Netherlands for the Ecodrive programme (Novem 1999). The communication campaign focused on a variety of media channels, including television, newspapers, magazines, printed material. In total approximately 25-30% of the total budget for Ecodrive was used for communication purposes (0,8-1M€/year), justified by considering the reach of the communication campaign.

Recognition of the Ecodrive programme by the target group has increased significantly over the last 5 years. In telephone surveys (n=1100) the spontaneous recognition has increased from 18% (1999) to 31% (2004). Supported recognition in 2004 was 50% (36% in 2003, SenterNovem 2005). The survey also showed how television has been the most effective channel to reach the target group (78% of the respondents indicate to know the programme via television) followed by radio (16%) and newspaper (17%).

Table 1 Programme recognition of Ecodrive (SenterNovem 2005)

Year	Programme recognition Spontaneous	Programme recognition With support
1999-2000	18%	
2001	21%	
2002	26%	
2003	26%	36%
2004	31%	50%

3.10 Familiarity with Ecodrive principles [4C]

Based on responses collected in the survey in 2004 the Ecodrive programme is largely associated with 'economic driving' (i.e. energy efficient, 33%), cost effectivity (24%), safety (20%). Respondents associate the programme less with typical ecodrive principles: early gear shifting (14%), anticipating traffic (3%), driving with constant speed (9%), rolling out in gears (7%), lower rpm (revolutions per minute) level (10%), steady acceleration (7%). And thus the familiarity with the Ecodrive principles is lower than the recognition of the name of the programme; not unexpectedly it is harder to increase programme recognition than to communicate the content of the Ecodrive programme.

3.11 Changes in driving behaviour [7]

The level to which Ecodrive drive style suggestions are applied by existing drivers, has been assessed through annual telephone surveys. In the survey 1100 respondents were asked to rate the extent to which they applied 3 selected Ecodrive principles (constant speed driving, limited revolutions, anticipation behavior). Based on the figures presented in figure 4 the following can be concluded:

- Between 2000 and 2004 more than 90% of all respondents familiar with the Ecodrive programme applied some (74-83%) or a lot (10-22%) of the Ecodrive drive style suggestions.
- The 1999 data serve as a reference case: without the Ecodrive programme it is likely that 83% of drivers would apply ecodriving "a little" and 10% of the drivers would apply ecodriving "a lot".
- Historically an increase can be observed of the percentage of drivers that apply the Ecodrive drive style suggestions 'a lot' (mostly at the expense of the percentage of drivers that only apply ecodriving 'a little'). The results suggest that the Ecodrive programme leads drivers that moderately apply ecodriving to intensify this behavior⁷.
- Less than 7% of the respondents acknowledge not to apply drive style suggestions at all.

⁷ Note that this has not been substantiated with real-life behaviour data.

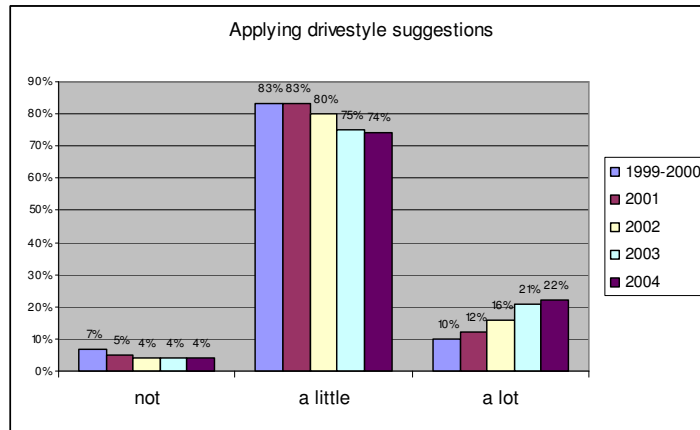


Figure 4 Level of using Ecodrive drive style suggestions by respondents (SenterNovem 2005)

The survey also included questions that provide insight whether respondents familiar with the Ecodrive programme applied the drive style suggestions more than respondents not familiar with the programme.

Figure 5 shows that drivers familiar with the Ecodrive programme are more likely to apply the drive style suggestions “a lot” than drivers not familiar with the programme - at the expense of drivers that apply the drive style suggestions “a little”. The data support the argument that the programme has been successful to catalyze more energy-efficient driving behaviour.

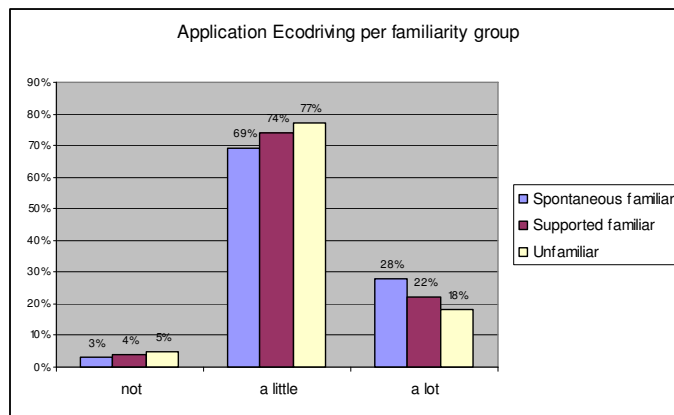


Figure 5 Application level per respondent group (SenterNovem 2005)

3.12 Checking tyre pressures [8]

Research shows that 45% of all vehicles have less than minimal required tyre pressures (Novem 1999). Objectives of the Ecodrive programme regarding tyre

pressures include that (i) at least 75% of all drivers have minimum (or higher) tyre pressures in 2005 (building up to 95% in 2010), (ii) at least 10 tank stations have automatic tyre pressure systems (building up to 100 in 2010), and (iii) checking tyre pressures is part of checklists for regular check ups at service stations(Novem 1999). Based on studies by BOVAG, the percentage of cars with correct tyre pressure has not increased in recent years.

The extent to which the Ecodrive programme has contributed to increased checking of tyre pressures of drivers is diffuse. Annual telephone surveys show no significant increase in tyre pressure checking by respondents (see figure 6). On the other hand, figure 7 shows that respondents with familiarity of the Ecodrive programme tend to check tyres more regularly. It may be concluded that the Ecodrive programme has had limited effect on the increased checking of tyre pressure by drivers.

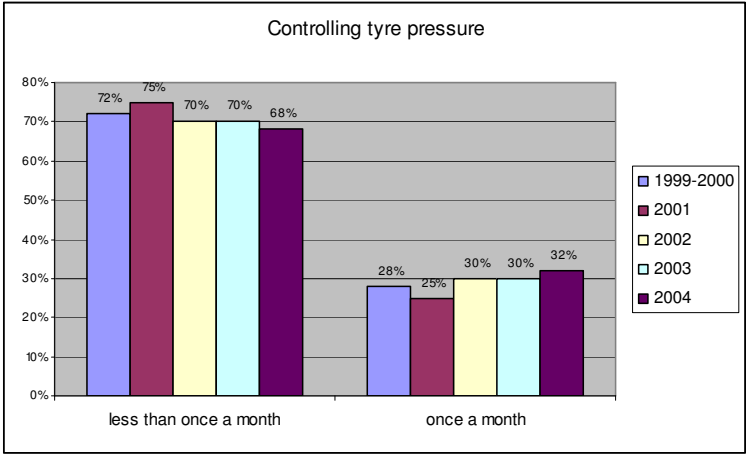


Figure 6 Level of tyre pressure checking (SenterNovem 2005)

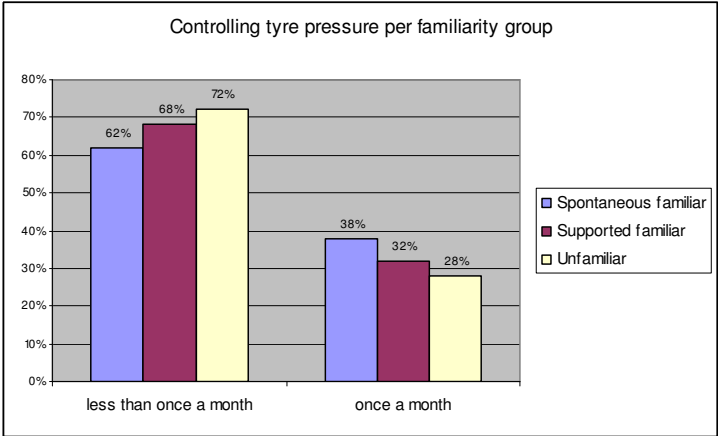


Figure 7 Level of tyre pressure checking, differentiated to type of respondents (SenterNovem 2005)

3.13 Possession of in-car devices [9]

With unaltered policy in 2004, SenterNovem predicts that in-car devices (econometers, boardcomputers, cruise control) will have a penetration of 50% in the total car park in 2006 (SenterNovem 2002). The Ecodrive programme has set the objective of increasing this level significantly by stimulating integration of in-car devices in *new cars* to 100% (SenterNovem 2002).

Specific activities include attention for in-car devices in communication campaigns⁸, subsidy projects for applying in-car devices, and lobbying activities on a national (e.g. for tax exemptions for in-car devices) and on an international scale (e.g. for setting up a covenant with the European automotive branche organization ACEA). Note that tax exemptions are financed by the Ministry of Finance⁹. The tax exemption for in-car devices was available from May 2000 to January 2005.

Based on the annual telephone survey an increase in in-car device possession in the *current car parc* can be observed, from 13% in 2000 to 33% in 2004 (see figure 8). Furthermore, integration of in-car devices in *new cars* has increased to over 70% in 2004 (SenterNovem 2005; Rai 2004). The majority of in-car devices sold are on-board computers (70% in 2003) and cruise controls (60% in 2003) (Rai 2004), which are mostly sold in combination. A device typically focused on reducing fuel usage, the econometer, has a limited penetration in new car sales (1%; Rai 2004).

The tax exemption scheme is likely to have played a role in the increase in penetration of in-car devices. Based on research of the automotive branche it is estimated that 45-60% of the in-car devices would not have been purchased without the tax exemption (Rai 2004); a freerider percentage of 50% is considered in assessing net impact of the tax exemption instrument.

Abolishment of the tax exemption scheme is likely to have been related to the high costs, shifted priorities in the tax exemption programme and the general idea that in-car devices would be purchased also without the tax exemption scheme.

⁸ Note that the purchase and use of in-car devices has not been specifically targeted in communication campaigns.

⁹ The costs associated with the tax exemption are partly added to the costs of the Ecodrive programme in order to calculate cost-efficiency of this measure

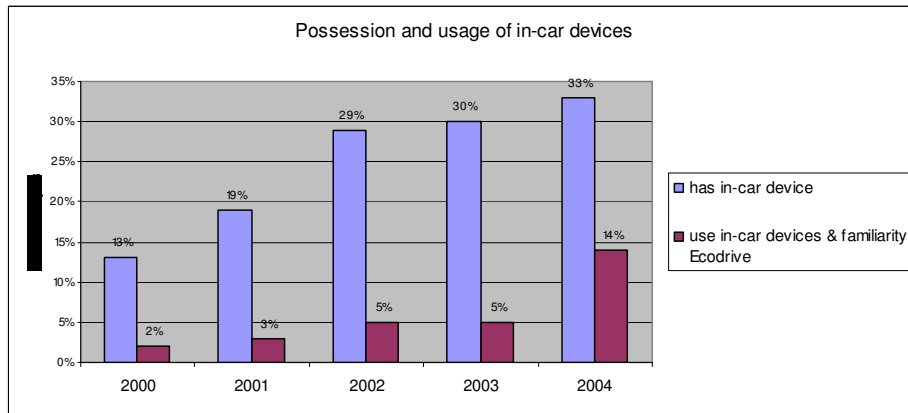


Figure 8 Possession/penetration and use of in-car devices (SenterNovem 2005)

3.14 Application of in-car devices [10]

Of the respondents in the annual survey an increasing percentage with in-car devices claim to use the device regularly, from 2% in 2000 tot 14% in 2004 (figure 8).

Respondents with knowledge of ecodriving are more inclined to use the in-car devices on a regular basis (figure 9), confirming the assumption that the Ecodrive programme has played a positive role in the application of in-car devices (SenterNovem 2005). In the survey the categories ‘Regular use’ versus ‘non-regular use’ were not defined, and respondents were asked to self assess their level of application. This may lead to error margins with regard to the actual savings achieved by in-car devices.

Note that penetration rates of cruise control and board computers are significantly higher than dedicated econometer (>60% versus 1%; Rai 2004). Both cruise controls as well as board computers have multiple functionalities; it is unlikely that these devices are solely purchased and used for increasing eco-efficiency alone.

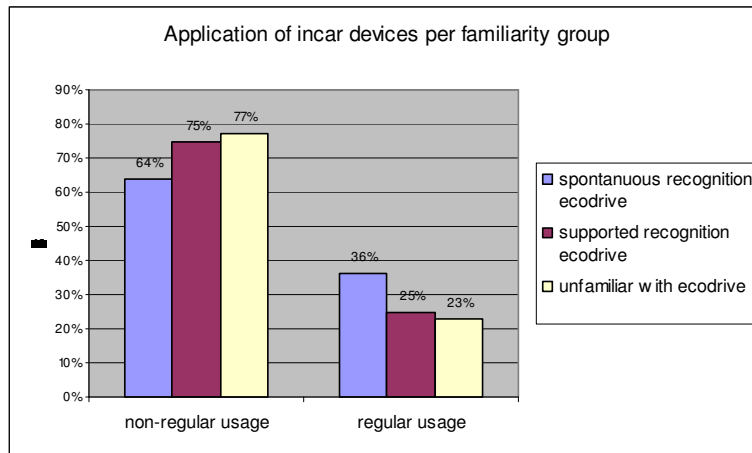
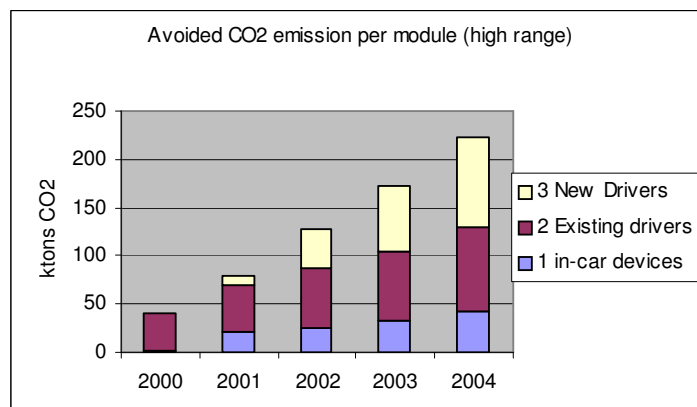


Figure 9 Level of usage of in-car devices differentiated on type of respondents (SenterNovem 2005)

3.15 Net impact

Based on above information, the total avoided CO₂ emissions as a result of the Ecodrive programme has grown from 9-41 kton (2000) to 97-222 kton (2004) (see figure 10). The net impact can be differentiated to the three 'policy-modules' (i) in-car devices, (ii) existing drivers / communication, (iii) new drivers / driving school curricula (figure 10).

- The module 'existing drivers' has been dominant in avoided CO₂ emissions in 2000 and 2001, as a result of the relative early communication activities (70-80% until 2001)
- By 2004 activities concerning new drivers contribute the most to CO₂ emission reduction (40-50% in 2004).
- In-car devices have limited potential for further growth (less than 20% - 2004).



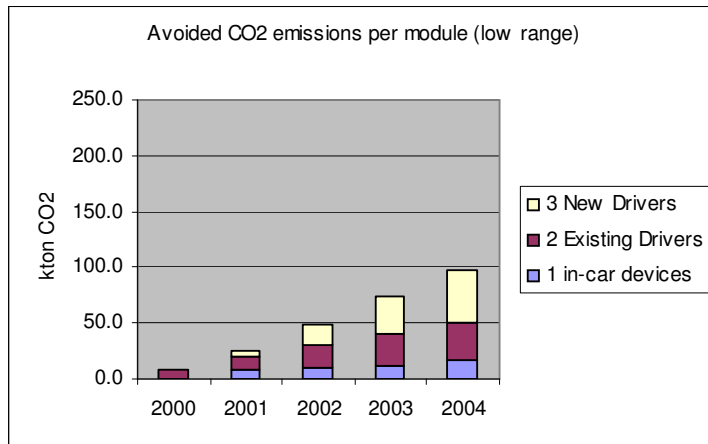


Figure 10 Avoided CO2 emissions per module from 2000-2004

The net impact of the Ecodrive programme is largely based on data collected in Novem/SenterNovem year reports (2000; 2001; 2002; 2003; 2004; 2005). In assessing the net impact a large number of assumptions have been made. The margins in the net impact (low-high values) as presented in this study are a result of including higher and lower values regarding several key assumptions on the three ‘policy-modules’ (i) in-car devices, (ii) existing drivers / communication, (iii) new drivers / driving school curricula (figure 10). These assumptions will be discussed shortly for clarification – table 2 provides an overview.

Table 2 Summary of assumptions for assessing margins in the net impact of the Ecodrive programme

	Assumptions for low limits	Assumptions for high limit
Assumptions regarding in-car devices		
Freeriders (purchasing in-car device without tax exemption)	50%	33%
CO ₂ emission reduction due to in-car devices	1.25%	2.5%
Assumptions regarding existing drivers		
Familiarity with Ecodrive principles (through communication campaigns).	12%	29%
Reduction of driving behaviour changes as a result of communication campaign ¹⁰	5%-1%	10% - 2%
Assumptions regarding new drivers		
Reach in personal transport	17.5%	35%
Reach in goods transport	50%	100%

¹⁰ Two figures are given in this table, the first (5% low; 10% high) for heavy adopters of the Ecodrive programme, and the second (1% and 2%) for moderate adopters of the programme.

Module 1: In-car devices

CO₂ emission reductions as a result of in-car devices has increased significantly from 2000 to 2004, upto 16-42kton in 2004. A majority of the growth of CO₂ emission reductions in 2004 (approx. 80%, SenterNovem 2005) can be attributed to the tax-exemption on in-car devices. The importance of tax exemption for the sales of in-car devices is confirmed by several interviewees.

With regard to in-car devices the following assumptions have lead to variance of a factor 2,6 between the upper and lower bandwidth limits:

- In-car devices would also have been sold without the tax exemption scheme, leading to freeriders. A freerider percentage range of 33% (based on comparative sales of in-car devices with neighbouring countries without tax exemption; SenterNovem 2005) to 50% (based on estimates from the branche; Rai 2004) is taken into account.
- For actual savings made due to the application of in-car devices a range of 1.25-2.5% is assumed. The 2.5% reflects the savings achieved by training cardrivers with incar devices; however the vast majority of drivers with in-car devices will not have had training in ecodriving, and are likely to be less aware and competent to achieve savings. Furthermore, it is questionable whether the in-car devices (particularly on-board computers with a 70% penetration) will be used for fuel saving given their multiple functions. The 1.25% (low versus 2.5%-high) provides a margin for these factors.

Several assumptions used in annual evaluations by SenterNovem have not been altered in this study, but require more investigation. They include high persistence levels of using in-car devices over time (assumed 75% per year), 80% use of in-car devices by drivers on a regular basis, and potential social desirable answers as a result of self-reporting of respondents in the annual telephone interviews.

Module 2: Existing Drivers / Communication Campaign

CO₂ emission reduction as a result of targeting licence owners has increased from 8-39kton in 2000 to 34-86kton in 2004. A majority of the reductions results from communication activities (e.g. campaigns, approximately 40-75% in 2004). Subsidized training activities account for approximately 10-20% of total reductions. A growing percentage of reductions result from effects of activities carried out in previous years, adding to 17-36% of the total CO₂ emission reductions in 2004.

The bandwidth (high-low) is result of variations in the following assumptions:

- Assumptions regarding the percentage of drivers reached through the communication campaign range from 12% (based on the annual survey data) to 29% (the level used by SenterNovem). The survey indicates that,

although respondents are familiar with the Ecodrive programme, respondents are limitedly familiar with the actual Ecodrive principles (between 5-14% varying for individual principles). As a result an average 12% familiarity is assumed.

- The effectiveness of the communication campaign to reach efficiency improvements in driving can be assumed to be lower than getting drive style training. This is supported by several interviewees which argue that direct training is significantly more effective in changing driving behaviour than communication and creating awareness alone. As a lower limit the improvement potential is halved (5% versus 10% for maximum improvements; 1% versus 2% for moderate improvements).

Assumptions that have not been altered, but which may require more investigation, are the 90% persistence level of ecodriving per year and potential negative influences of social desirable answers in the surveys.

Module 3: New Drivers / Drive school curriculum

The integration of Ecodrive in the drive school curriculum has led to a reduction of CO₂ emissions of 47-94 kton in 2004. A majority of these emission reductions are a result of reductions in goods transport (40-60% of total). Assumptions that lead to variance in the results include the following:

- For goods transport SenterNovem (2005) assumes 100% reach (all professional drivers apply ecodriving as a result of the programme) and 100% persistence (over the years). Indeed, as a large beneficiary of efficient driving, goods transport is likely to be more focused on applying ecodriving for economic reasons. However, also without the Ecodrive programme more efficient driving will be/have been propagated in this sector. A reference case of 50% will be used as a lower range limit, indicating that as result of the Ecodriving programme 50% of new professional drivers apply ecodriving which without the programme would not have been reached.
- Similarly reference levels are included for regular new drivers. Figures 5 and 7 show how existing drivers apply ecodriving principles to some extent (77% in 2004) and to a large extent (18%) without being familiar with the Ecodrive programme (SenterNovem 2005). And thus, one can assume that a large share of new drivers to some extent will be applying ecodriving principles without being familiar with the programme. Margins considered in this study range from 17.5% (assumption of this study) to 35% (SenterNovem 2005).

Not taken into account are the high assumed involvement and commitment of instructors (assumed 92%), high persistence levels for applying ecodriving over

time (90% for drivers), and potential negative influences of social desirable answers in the survey.

Conclusions net impact

Activities that have contributed most to CO₂ emission reductions include (i) the implementation in driving school curricula, (ii) public campaigns to reach existing drivers, (iii) subsidized activities to reach professional drivers, and (iv) tax exemption for in-car devices. Given the increased contribution of historical trainings on current impact (due to persistence of the drive style changes), it would be relevant to assess in more detail realistic persistence levels.

Activities with limited contribution to the total emissions include (i) subsidized activities for (non-professional) existing drivers, and (ii) subsidized activities for in-car devices¹¹.

The underlying assumptions for calculating the impact of the programme have a significant influence on the assessment of the programme's success: the lower and higher limits of the bandwidth differ with a factor 2.3. More research is required to confirm the assumptions. Although this type of (behavioural) research is complex and expensive, the current assumptions do not enable to make thorough estimations of the programme's net impact.

Similarly this report has not taken into account a sensitivity analysis of the influence of oil prices on the adoption of ecodriving; given that this is likely to have effect on driving behavior, it is recommended to further study this relationship.

3.16 Effectiveness

Figure 11 shows the programme's impact on CO₂ emission between 2000 and 2004. A significant rise in the effectiveness of the programme can be discerned. Dependent on progress in coming years the programme has perspective to reach significant reductions, in the order of magnitude of the reduction objectives set for 2010 (0,8 Mton) with intermediate goals for 2005 (0,4 Mton).

¹¹ Note that subsidized activities related to in-car devices differs from tax-exemption; the former being more focused on knowledge transfer and campaigns to stimulate purchase and usage of in-car devices.

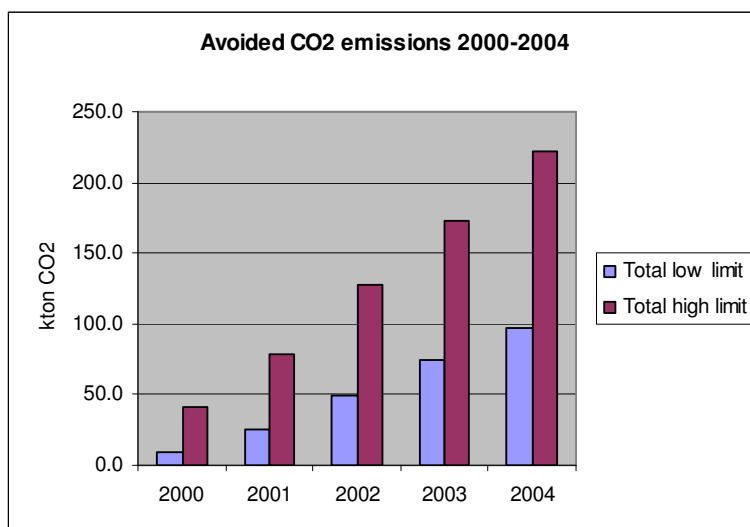


Figure 11 Avoided CO2 emissions – upper/lower limits

3.17 Cost efficiency

The Ecodrive programme had cost efficiency objectives of €9/ton CO₂ (SenterNovem 1999). In assessing cost efficiency for society, government, other organizations and the end-user the following assumptions were made, to calculate a low and high range (conform earlier assumptions considered in this report)¹².

	<i>Low</i>	<i>High</i>	<i>Relevant for:</i>
Average tax exemption per in-car device	150 €	200 €	In-car device costs for government (deferred tax income)
Average end-user contribution to in-car device	50 €	150 €	In-car device costs for end-users / cost efficiency for society
Freeriders in-car devices	33%	50%	In-car devices costs for (i) government (deferred tax income) and (ii) end-users (contribution in purchase of devices)
Use level of in-car devices	50%	80%	(i) Cost savings (end users) and (ii) tax income losses (government)
Annual savings with in-car device	1%	2%	(i) Cost savings (end users) and (ii) tax income losses (government)

Average gasoline prices of €1.15 are considered; of which €0.84 is taxed by government (including excise duty, VAT). An annual gasoline consumption of 1250 liter per car owner is considered (SenterNovem 2005).

3.17.1 Society

Societal costs as a result of the Ecodrive programme include importing and installment costs for in-car devices. These costs are subtracted by (ii) fuel cost

¹² The data of SenterNovem were used for the assumptions in the 'high' option. The whole range of lower to upper limits were used to calculate cost efficiency.

savings as a result of the Ecodrive programme (excluding levies and taxes), and subsequently divided by the gross impact (CO₂ emissions).

Based on above assumptions average cost efficiency for society over the period 2000-2004 has been €350 to -€38/ton avoided CO₂ emission. The large range is explained by variance in the net impact, variance in costs for in-car devices and variance in fuel cost savings as a result of the programme.

Particularly in-car devices costs are high (€11-27M in 2004); similar cost savings as a result of fuel savings may be reached as a result of the programme (€12-28M in 2004)¹³.

3.17.2 Government

Costs for government include (i) Ecodrive programme costs and (ii) costs for in-car devices (incurred by Ministry of Finance). These costs are divided by the CO₂ emission reductions (net impact).

Between 2000-2004 the cost efficiency of the Ecodrive programme for the government ranges from €9-20 per avoided ton CO₂ emission (in case tax exemption costs are not included).

The annual budgets of the Ecodrive programme (€2M in 2004) are significantly lower than the costs due to the tax exemption on in-car devices (€5-9M in 2004¹⁴) – incurred by the Dutch Ministry of Finance. In case tax exemption costs are included cost efficiency are in the range of €68-99 per avoided ton CO₂ emission¹⁵.

Not included in this analysis are the deferred taxes on fuels: fuel savings achieved due to the Ecodrive programme mounts up to a loss in income of €34-78M in 2004 alone. Similarly value added tax for in-car devices are not taken into account.

3.17.3 Other organisations

No major costs were made by other organisations. Mostly personnel costs were made by partners in the Ecodrive programme. However, these costs are negligible in comparison to the programme costs, and therefore these costs will not be considered in this report.

¹³ 4% discount rate used.

¹⁴ Both based on annuities

¹⁵ In this calculation it is taken into account that the Ecodrive programme has been partly responsible in arranging the tax exemption as well as supporting its application. Rather than taking the full costs of the tax exemption into account, only 50% of these costs of the Ministry of Finance are included in making the cost efficiency calculation (€2.5-4.5M instead of €5-9M).

3.17.4 End-user

Cost efficiency of the end-user includes (i) costs for purchasing in-car devices (including tax exemption) subtracted by (ii) cost savings as a result of the Ecodrive programme, divided by the gross CO₂ emission reductions¹⁶.

Between 2000-2004 the cost efficiency of the Ecodrive programme for end users range from -€210 to -€418 per avoided ton CO₂ emission; which is the result of the high annual fuel cost savings as a result of the implementation of ecodriving (€46-106M in 2004), and relatively low investments by car owners for in-car devices (€3-14M in 2004).

3.18 Overview Indicators and values

Table 3 provides an overview of indicators and values of the Ecodrive programme as mentioned in this report.

Table 3 Overview indicators and values Ecodrive programme

#	Variable	Indicator	Value
2	Stakeholder involvement	Number of stakeholders	>20
		Coverage to end users	Large
		Commitment to programme	Moderate
3A	Train the trainers	% of instructors trained	74% instructors 93% instructors (professional)
		Level of integration in curricula	Moderate/high
4A	Drive school examination	% of new drivers trained in theory	Approaching 100%
5A	New drivers trained	% of new drivers trained in practice	Assumed 92%
4B	Subsidized activities	Available budget	1 M€/year
5B	Applicants activities	# of projects in programme	>100 projects (2000-2004)
6B	Existing drivers trained	# existing drivers trained	150.000
		% of existing drivers trained	1,5% of driver population
3C	Communication campaign	Available budget	0,8-1M€ /year
4C	Increased awareness	Programme recognition	31% (spontaneous)
		Familiarity with Ecodrive principles	7-33% (depending on type of Ecodrive principle)
7	Driving behavior	% of adopters + level of adoption	Slight increase (<10%) of drivers that increase applying Ecodriving “a lot”
8	Tyre pressure checking	% of drivers checking tyre pressures (compared to reference)	Diffuse – not statistically significant
		Frequency of tyre checking	Diffuse – not statistically significant

¹⁶ Freeriders are excluded; a discount rate of 8% is used to calculate annuities.

9	Possession in-car devices	Penetration rate in-car devices – current car parc	13% (2000) to 33% (2004)
10	Application in-car devices	Application rates in-car devices	From 2 to 14% (200-2004)
	Net Impact	Avoided GHG emissions	9-41 kton CO ₂ (2000) 97-222 kton CO ₂ (2004)
	Cost efficiency	Society	€350 to -€38 /ton avoided CO ₂
		Government	€9-20 per avoided ton CO ₂ (excl tax exemption) €68-99 per avoided ton CO ₂ (inc tax exemption)
		End-users	-€210 to -€418 per avoided ton CO ₂

4 Conclusions

4.1 Net impact, effectiveness and cost efficiency

Since its initiation in 1999 the Ecodrive programme has focused on achieving CO₂ reductions through changing drive style behaviour of new and existing drivers.

In the period under research in this study (2000-2004), the total avoided CO₂ emissions as a result of the Ecodrive programme (net impact) has grown from 9-41 kton in 2000 to 97-222 kton in 2004.

In terms of the three 'policy-modules' of the Ecodrive programme, the majority of CO₂ emission reductions originate from communication activities for existing drivers. In recent years the effects of the developed driving curriculum for new drivers is increasingly contributing to the emission reductions. Lastly, in-car devices have had a continued, but more modest contribution to the total CO₂ emission reductions (upto 20%).

The communication campaign has been an effective instrument; high costs for setting up the campaign are compensated by large reach. Furthermore, integration in driving school curricula, as well as tax exemption of in-car devices have been effective instruments. Less effective are the subsidized activities due to relative high costs, and low reach.

In terms of effectiveness, the programme shows a steady increase in CO₂ reductions. In order to meet the objectives for 2010 (0,8Mton) it is required that the demonstrated progress continues (in case of the more optimistic assumptions used for the high limit range) or accelerates significantly (in case of the more conservative assumptions for the lower limit range).

Cost efficiency has been calculated for society, government and end-users. Beside the programme costs itself, complementary costs for installing in-car devices have been included (tax exemption costs, costs for end users). Furthermore, assumptions have been included regarding the benefits of the Ecodrive programme, namely fuel savings by end-users. Resulting loss of tax income for the government has been calculated but not included in the calculation of cost efficiency.

Based on above assumptions average cost efficiency has been calculated for the period 2000-2004. Cost efficiency for *society* is estimated on -€38/ton to €350/ton avoided CO₂ emission. Cost efficiency for government is €9-20/avoided ton CO₂

(excluding tax exemption costs) and 68-99€/ton in case tax exemption is included. Lastly cost efficiency for consumers is estimated on -€210 to -€418 per avoided ton CO₂ emission (benefit as a result of lower fuel costs).

4.2 Success and failure factors

Based on the analysis the following **success** factors have been identified for the Dutch Ecodrive programme.

An important success factor of the Ecodrive programme has been its efforts to incorporate its activities in institutionalized structures. With its strategy to ‘Train the trainer’ the Ecodrive programme has been particularly successful in reaching the target group of instructors (92% trained in ecodriving). Furthermore, the programme has been successful in integrating the Ecodrive principles in the theory examination procedure for new drivers. In the coming years it is envisaged to integrate ecodriving in the practical examination procedure. These structures provide an effective way in reaching a nearly 100% of all new drivers for incorporating ecodriving in practice.

An important precondition for the success of the Ecodrive programme has been the creation of a network with representative stakeholders in the automotive and transportation sector. Not only has the network facilitated the set up of necessary structures (e.g. curricula, trainings) and dissemination (via the communication channels of individual partners), the network has also provided legitimacy and credibility of the programme. Finally the network provided a good way of reaching the broad of stakeholders involved in ecodriving, from end-users to car dealers.

Finally, the broad range of communication activities has provided a high recognition of the programme with the general public (> 31% in 2004). This was achieved by combining a range of specific communication activities (including multi-media games, simulators, website simulators, participation in events) with regular communication channels (TV, magazines, newspapers).

Less successful have been the activities to train a significant part of current drivers through trainings and subsidized/programme activities. Where training is likely to be more effective than mere communication in creating awareness in ecodriving, less than 1% of existing drivers are reached on a yearly basis.

Although the programme has been successful in attracting relevant automotive stakeholders (e.g. dealers), the participation level of these companies is low, and the commitment to invest in ecodriving activities is limited. Furthermore, the pro-

gramme has been limitedly successful in reaching all relevant stakeholders, most notably car manufacturers, oil companies on European level¹⁷.

Overall, large uncertainties relate to the assessment of the net impact of the programme. The large number of assumptions and the limited amount of research in this field limits a detailed estimation of the actual impact. Several interviewees have been sceptical on the actual impacts of the programme. Despite the complexity of behavioural research, in order to make a more thorough evaluation of the Ecodrive programme, more research should be carried out to back up the most relevant assumptions, amongst others related to the effect of the communication campaign on changed behaviour of existing drivers, the persistence of ecodriving longitudinally and actual day-to-day fuel savings due to ecodriving.

4.3 Learning experiences

The most important lessons learnt as a result of the Ecodrive programme include focussing on altering institutional structures (driving school curricula) that underlie or are related to the application of non-efficient behaviour or devices. The Ecodrive programme provides opportunities to integrate more energy efficient principles to a new generation of drivers.

Furthermore the focus on creating relevant partnerships provides opportunities for creating a wide reach and credibility for the energy efficiency programmes. Governments may provide more credibility for energy efficient programmes by involving private parties to reach the target group (in this case: drivers).

Lastly, the case underlines the importance of financial instruments (tax exemptions in-car devices) to facilitate the adoption of energy-efficient devices.

¹⁷ It must be noted that the programme is currently focussed on attracting these stakeholders.

References – interviews

Person	Position and organization	Date
Henk Wardenaar	Senior Policy Staff Directorate Road Infrastructure and Traffic Safety Ministry of Transport, Public Works and Water Management	September 14, 2005
Peter Wilbers	Senior programme advisor Ecodrive programme SenterNovem	September 12, 2005
Niek Versteeg	Directeur Rijopleidingen ANWB	September 19, 2005
Kees de Regt	Manager Verkoop ANWB	
Wybe Zijlstra	Policy staff after sales BOVAG	September 14, 2005

References

Beeldman, M., J.A. Oude Lohuis, et al. (1999): De uitvoeringsnota klimaatbeleid doorgelicht. Een analyse op basis van het Optiedocument. ECN/RIVM.

CBS, 2005; Prijzen Motorbrandstoffen, www.cbs.nl

Dril, A.W.N. and H.E. Elzenga, 2005: Referentieramingen energie en emissies 2005-2020, Petten

Ministry of Environmental Affairs, 1999; Climate Change Action Plan; Part 1: domestic measures, Den Haag.

NDA, 2004: BPM-vrije accessoires verdwijnen 1 januari 2005. *NDA Dealernieuws*, 7, December 3, 2004, pp.4

Novem, 1999: Meerjarenvoorstel Het Nieuwe Rijden 1999-2005. Novem, Utrecht

Novem, 2001: Jaarverslag 1999-2000. Het Nieuwe Rijden. Novem, Utrecht

Novem, 2002: Jaarverslag 2001. Het Nieuwe Rijden. Novem, Utrecht.

Novem, 2002: Meerjarenprogramma Het Nieuwe Rijden 2003-2006 – “HNR 2^e fase”. Novem, Utrecht

Novem, 2003: Jaarverslag 2002. Het Nieuwe Rijden. Novem, Utrecht.

QAED, 2000: Evaluation of Eco-Drive® courses, “Energy 2000”. QAED, Bern

QAED, 2004: Summary: Evaluation of Eco-Drive, Training Courses. QAED, Zurich.

RAI, 2004: Inventarisatie BPM-vrije accessoires 2003. RAI Vereniging, Amsterdam

SenterNovem, 2004: Jaarverslag 2003. Het Nieuwe Rijden. SenterNovem, Utrecht.

SenterNovem, 2005: Jaarverslag 2004. Het Nieuwe Rijden. SenterNovem, Utrecht.

Traffic Test, 2002[1]. Het Nieuwe Rijden-B. Resultaat van de trainingen voor rij-instructeurs en examinatoren

Traffic Test, 2002[2]. Het Nieuwe Rijden-C/E. Resultaat van de trainingen voor rij-instructeurs en examinatoren