THE PEP PARTNERSHIP ON ECODRIVING

Guidelines for EcoDriving programs

Suggestions and recommendations for Establishing National EcoDriving Initiatives in a Nutshell

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Introduction

The subject matter of the present paper is the sustainable and energy efficient use of motorised vehicles (particularly cars, trucks and buses) which is often referred to as EcoDriving.

The recommendations at hand were compiled in the framework of the „THE PEP Partnership on EcoDriving“, which was initiated and is led by Austria with a strong focus on international cooperation. The partnership contributes to the implementation of the THE PEP Paris declaration “City in Motion – People First!”, reducing emissions of transport-related greenhouse gases, air pollutants and noise; as well as promoting policies and actions conducive to healthy and safe modes of transport.

The situation of EcoDriving integration and development in the THE PEP member countries is very diverse. This paper offers an overview on which elements for EcoDriving programmes are most crucial and which requirements need to be considered. It was compiled making use of know-how and experience coming from several national initiatives and European projects. The aim is to lay the basis for successfully establishing national EcoDriving projects and programs in countries or regions, especially where minor or no EcoDriving programmes exist yet.

Reminder – why EcoDriving?

EcoDriving is an easy but efficient way of driving and saving money while still allowing a high degree of flexibility and individuality. It works with all vehicles, old or newer. Thus EcoDriving is immediately feasible for everyone. EcoDrive makes optimum use of today’s technology, modern engines and advanced vehicle technologies. EcoDrivers not only save money – but drive more safely, look after their cars and tend to enjoy driving more than ordinary drivers as the techniques reduce stress.

All the benefits mentioned can be achieved in equal or reduced travel time. Experience shows that EcoDrivers do not take longer to reach their destination, but are often even faster. This is mostly due to accelerating traffic flow and thus avoiding stops.

Reminder – how to EcoDrive

An elaboration of EcoDriving techniques is the core part of all EcoDriving seminars and trainings. The most important EcoDriving techniques (also called “Golden Rules of EcoDriving”) have been defined on European level and are presented below in brief:

- Greater anticipation in order to avoid unnecessary acceleration and braking and make maximum use of the vehicle's momentum
- Maintain a steady speed at low RPM (revolutions per minute)
- Shift up early (by approximately 2,000 RPM)
- Check tyre pressures frequently
- Remember all ancillary loads add to fuel consumption (electrical equipment, air conditioning, carrying dead weight, etc.)
Of course there are more driving techniques which are relevant for EcoDriving. Furthermore, there are EcoDriving tips not related to driving, such as:

- Fuel-saving starts with choosing a low emission car,
- Avoid short car trips as cold engines need much more fuel per km,
- Organise a carpool, and
- Consider alternative means of transport (cycling, walking, public transport, car sharing)

The THE PEP partnership on EcoDriving

Within the THE PEP (Transport, Health, Environment Pan-European Program) – a joint programme of UNECE and WHO which brings together national transport, health and environment ministries from 56 European countries with the aim to promote environment-friendly and health-promoted mobility all over Europe.

EcoDriving was chosen by the THE PEP steering committee for a THE PEP partnership as a suitable instrument for sustainable mobility. THE PEP partnership on EcoDriving was launched at the THE PEP klimaaktiv mobil conference 2014 in Vienna with a strong focus to exchanging experiences among interested partners for the promotion of EcoDriving.

The THE PEP klimaaktiv mobil conference in Vienna on 14 July 2014

- First meeting of the THE PEP Task Force on EcoDriving
- Discussion and approval of work program
- EcoDriving practice day with cars, buses and electric vehicles

The THE PEP partnership on EcoDriving contributes to the five priority goals of the THE PEP Paris declaration by building capacities for promoting an EcoDriving style that supports the achievement of these goals. In particular, the partnership targets on reducing emissions of transport-related greenhouse gases, air pollutants and noise (goal three). Furthermore, it also contributes strongly to promoting policies and actions conducive to healthy and safe modes of transport (goal four).

The THE PEP partnership offers exchange of experience as well as performance of EcoDriving trainings and education seminars for driving trainers in respective countries: Austrian EcoDriving master trainers conduct pilot trainings for Taxi drivers, bus drivers and driving instructors in THE PEP member countries, e.g. in Kazakhstan and the Russian Federation.

### THE PEP EcoDriving Pilot Workshop in Almaty, Kazakhstan, April 2014

- two-day passenger car and one-day bus training seminar and practice with three Austrian master trainers
- participants: 17 driving school teachers and 13 bus drivers of Almaty public bus fleet
- Concluding workshop chaired by the Vice-Mayor of Almaty with 30 stakeholders
- Results from the trainings with passenger car: average fuel reduction of 6 - 22%!

### THE PEP EcoDriving Pilot Workshop in Kaliningrad, Russia, September 2014

- three-day bus training seminar and practice with three Austrian master trainers
- participants: 10 driving school teachers and two bus drivers from a Kaliningrad local mini-bus fleet
- international workshop on urban mobility and environment chaired by the Vice-Mayor of Kaliningrad with 40 stakeholders

### Lessons learned from pilot trainings

- The EcoDriving training concept is applicable to the traffic conditions in both Almaty and Kaliningrad metropolitan area
- Approaching and leaving the bus stop bay/area needs to be trained specifically as there is a big potential for fuel saving.
- Fuel consumption monitoring devices are of crucial importance for the success of EcoDriving as they provide the necessary real-time feed-back information to the driver allowing to adapt the driving style!
The partnership is coordinated by Robert Thaler, Head of Division Clean Mobility in the Austrian Federal Ministry for Sustainability and Tourism.

Robert Thaler, Head of Head of Division Clean Mobility in the Austrian Ministry for Sustainability and Tourism. Source: BMNT, Photo: Hörmandinger

Bus drivers at the pilot training in Almaty, Kazakhstan
1. Ensure longevity of the EcoDriving initiative

1.1. Establish an organisation leading the programme

Establish a long-term body which is responsible for the EcoDriving programme. This could be a ministry, an energy agency, an association of driving schools, an automobile club, an organisation dealing with traffic safety or a company which is experienced in the field of driving education.

The organisation should have good contacts with relevant political bodies as well as companies which are possible customers for trainings.

Search for active collaboration with automobile clubs, fleet associations, the car industry, car importers, authorities, public administration, etc.

The goal is to establish an EcoDriving infrastructure which will keep the approach alive in the long-term.

1.2. Embed the programme into an long-term strategy (including long-term funding)

Experience shows that EcoDriving initiatives which are set-up and financed only for a relative short period of time (e.g. two years or even five years) tend to have poor lasting effects afterwards.

Thus, try to embed the topic of EcoDriving into an official long-term national policy or strategy, possibly on energy efficiency or climate protection, which is signed by relevant government representatives. For example, in Austria EcoDriving is integrated in the national energy and climate strategy as a measure to be implemented on the long term.

Also try to ensure a long term contract with relevant funding bodies or sponsors.

1.3. Integrate EcoDriving trainings into existing programmes and regulations

Experience shows that EcoDriving trainings are rather hard to sell at market price. Therefore it is very helpful if EcoDriving can be added to mandatory training programs, such as the curricula for practical training for learner drivers within driving education; or the advanced training education for bus- and truck drivers (Directive 2007/46/EC). Another approach is to try to combine EcoDriving trainings with obligatory training for drivers seeking to regain their licences after having lost them due to motoring offences.

EcoDriving can also be integrated into the Energy & Environment Management Systems of companies (ISO 50001, ISO 14001)

1.4. Funding by third-parties

Given that EcoDriving reduces accident rates there is a good reason to seek funding for training from insurance companies. This has been tried before and experience shows that insurance companies may be reluctant to get involved, but securing an effective partnership with an insurance company funding training remains an attractive, if often elusive, option.

Leasing companies might also fund training for their clients and this approach has had some success in the past in some countries.
2. Get expertise and experts

2.1. Investigate into the current status of EcoDriving
Check whether there have been existing EcoDriving initiatives or projects in your country, be it from individual bodies or training providers or in context of an international project.
Identify and analyse the specific national or local circumstances and obstacles towards the implementation of EcoDriving.

2.2. Make use of external experience
In case there is no experienced EcoDriving body in the country or region yet, consider involving an experienced partner of another country which is running an EcoDriving programme for a long period of time and can consult individually on important matters which may apply in the starting phase of a new programme.

2.3. Establish a consortium of EcoDriving master trainers
Find a group of motivated to-be master trainers. These should be driving instructors who are experienced in giving further education to other instructors.

Austrian and German master trainers in discussion
Educate some master trainers. External master trainers from experienced countries are essential for such an initial seminar. The number of master trainers should be sufficient to cover the whole country regarding further training seminars. For example, in Austria there are six EcoDriving master trainers, based in different parts of the country. This consortium of master trainers has educated and certified around 1,000 driving instructors in around 12 years.

2.4. Set standards for train-the-trainer seminars
Define minimum standards for EcoDriving trainings and trainer education, in terms of minimum duration (both regarding the practical and the theoretical part, maximal number of trainees per trainer and content of seminars and trainings.
Compile national handbooks and teaching materials in national language using available documents and consultancy of experienced partners from other countries.
Include all the technical components on EcoDriving (background information, facts and data on EcoDriving) but also didactical basics on how EcoDriving can be best taught to learners and licensed drivers.
Take national circumstances and preconditions into account. It’s important to achieve a balance between being sufficiently flexible to accommodate national differences – particularly regarding the legal situation, training requirements and preferred workshop format – whilst still profiting from the benefits of international experience.

2.5. Qualify and certify EcoDriving trainers (Train the Trainers)
Start a training programme for further EcoDriving trainers, led by the national master trainers. The number of required instructors again depends on the country.
A training seminar for to-be EcoDriving with passenger cars typically requires a two-day seminar including theoretical as well as practical training. The training EcoDriving with cars is to be seen as basis seminar, which can be followed by an advanced training course for EcoDriving with utility vehicles (trucks and buses). Some EcoDriving programmes also include EcoDriving trainings specialising on trams, trains, tractors, or...
Such an advanced seminar also typically requires a two-day seminar including theoretical as well as practical training lessons.

Also define a testing procedure which a to-be EcoDriving trainer needs to pass. Establish a certificate for new EcoDriving trainers stating that they successfully completed the training seminar.

3. Emphasise all the benefits of EcoDriving (and not only saving fuel costs)

EcoDriving offers numerous benefits: It not only saves fuel and money, but it also works as a road safety tool and improves the quality of the local and global environment.

Results from EcoDriving projects all over Europe prove that trained drivers can easily reach average fuel reductions of 5-10% for trucks and buses, and up 10-20% for cars by practicing an energy efficient driving style.

Hence, the most important personal and immediate benefit of EcoDriving is the saving of fuel costs. As the effects outweigh the costs for trainings by far, EcoDriving trainings are a very cost effective environmental measure.

Moreover, EcoDriving helps to realise a number of further positive effects:

- EcoDriving reduces not only fuel costs, but also costs for maintenance and costs for repairing cars after accidents. EcoDrivers cause less wear and tear on car parts (tyres, brakes and engine) and are less prone to accidents
- Climate protection and saving of resources: EcoDriving contributes to a substantial reduction of fuel consumption, thus reduces greenhouse gas emissions
- Reducing health risks: fewer toxic exhaust gases and particulates resulting in a reduced impact on the local environment
- In particular, low RPM gear changes which apply through EcoDriving, can reduce NOx emissions significantly (by 50% and more) compared to high RPM which apply when driving aggressively.
- Passengers of EcoDrivers enjoy a more comfortable experience due to a smoother driving style (smooth use of the accelerator, steering, transmission and brakes)
- Enhanced traffic safety by widening the scope for action (i.e. anticipatory driving, compensating an irregular traffic flow by greater buffer distance)
- Benefits for both drivers and passengers also include increased safety on the roads, and less noise generated

All the benefits mentioned can be achieved in equal or reduced travel time. Experience shows that EcoDrivers do not take longer to reach their destination, but are often even faster. This is mostly due to accelerating traffic flow and thus avoiding stops.

4. Understand the importance of practical trainings

4.1. EcoDriving tips vs practical training

There are a lot of listings on websites and documents with EcoDriving tips and techniques. Also, there are a lot of seminars offered, some of which targeting professional drivers of trucks and buses, which only consist of theoretical training.

However, in order to really change driving behaviour and save fuel in the long term, it is not sufficient that drivers just try to follow some tips listed, but drivers need to attend an EcoDriving training given by a qualified driving instructor. Such training combines theoretical classroom sessions with practical driving on public roads.
The emphasis on practical driving in public traffic provides drivers with first-hand experience of EcoDriving in real world traffic. Furthermore, it ensures that the EcoDriving trainer will focus on the actual driving style of the driver (including poor driving habits).

The EcoDriving trainer delivering training needs to address behavioural patterns that have been internalised over years and should try to take account of a driver’s social and cultural preconceptions. For example, it will be hard to encourage a driver to shift up early whilst applying moderate gas pedal if he thinks this combination might strain an engine or waste fuel. But if a trainer is aware of the driver’s reservations then the coach can address them head on, for example, by explaining that regardless of the accelerator pedal position, a modern engine will not inject excess fuel.

In order to be able to demonstrate the specific fuel consumption of different driving styles, make sure that fuel consumption monitoring devices are available for the vehicles used in practical EcoDriving trainings.

4.2. General structure of practical trainings

It’s important that drivers experience the effect of EcoDriving directly. This is best achieved when the practical part contains driving the same route (of about 20 minutes) twice, while fuel consumption and duration of the trip are measured by means of a board computer. Thus, comparisons of fuel consumption (and resulting costs savings projected for a year) before and after the training can be instantly made and work as an eye-opener for drivers.

For the first drive, the participant is advised that he/she should drive as usual. The trainer gets a general idea of the participant's driving style, but does not give any information or tips on economical driving.

In the second drive, the participant is taught economic driving in relation to his personal driving style and the technology of his specific vehicle, and in particular what has been worked out in theory is put into practice. The trainer promotes the strengths of the drivers and minimises the weaknesses. This ensures that the technology corresponds to the personal driving style and the vehicle is used correctly.

After the second drive, the trainer uses the values of the on-board computer to give an overview of the comparison between the 1st and 2nd drive. Usually the values of the 2nd drive are better than the values of the 1st drive, however, traffic or weather influences can also lead to worse values (traffic jam, slow vehicle, wind, rain). This would be discussed with the participant in the vehicle. Any deficiencies of the participant would still be communicated to him as practical tips.

Such practical trainings must be on public roads and should be in an area with medium traffic (no congestion but also no empty roads).

Consequently with this view, training with EcoDriving simulators can never substitute practical trainings but may only serve, possibly on locations such as events or fairs, as a teaser on the subject, in order to motivate drivers to apply an EcoDriving training which also includes a practical part.
5. Plan the roll-out of EcoDriving training courses

5.1. Identify your key target groups

Consider possible main target groups for the EcoDriving training offers. These include

- Private companies with vehicle fleets (in particular cars, trucks and buses)
- School bus drivers, taxi drivers
- Drivers in public administration (federal, state, municipal)
- Police, Federal Armed Forces, Railway, Post Office
- Other public transport operators
- All users of private cars

The enforcement of EcoDriving in public fleets – probably including emergency services (police, fire, ambulance) – can work well to promote the concept by giving good examples and raise its acceptance.

5.2. Identify your key messages

For most EcoDriving campaigns, by far the most popular marketing message used is the financial benefits of reduced fuel consumption. The next most popular messages are the safety benefits and the concept of EcoDriving as a better or more modern way of driving. The idea behind promoting EcoDriving as better or more modern driving is to position it as an aspirational product that people will want to do, rather than something they feel they ought to do. The environmental benefits are a popular additional message, as well as reduced driver stress.

5.3. Produce marketing materials and promote EcoDriving trainings

Prepare leaflets & giveaways aimed at your target groups which can be used for marketing your training offers and transporting the key messages and benefits.

Such leaflets or giveaways are also well worth offering drivers at the end of their EcoDriving training. Leaflets can provide a good opportunity to reiterate the EcoDriving techniques and tips as well as safety and fuel saving benefits of EcoDriving, to encourage drivers to monitor their fuel consumption and of course to encourage drivers to use EcoDriving techniques in their day to day driving.

Giveaways should be designed to remind drivers about their training and are usually branded with a website URL or other contact details for further information. Some examples of EcoDriving giveaways include tyre pressure gauges, car stickers, windscreen scrapers, car ‘first aid kits’, devices to help calculate fuel consumption and windscreen sun shields. Get company fleets involved

5.4. Start with targeting fleets with which contacts are already established.

In the starting phase of an EcoDriving program, it is helpful to motivate companies by some kind of incentives, like a special price for the training or even for free. Make sure that such initial subsidised trainings are well documented including a comprehensive before/after evaluation over a certain period of time (e.g. three or five months, up to one year). In this way you will be able to prove toward further companies that the trainings are working and can indeed achieve the desired benefits.

Another option is to seek to get EcoDriving training embedded in to company processes. For example, as part of general induction training for new employees, in conjunction with vehicle purchasing, or relating to companies’ environmental policies. Sustainability managers are a good first contact as they have their own targets in terms of energy (and thus fuel) reduction and so are likely more interested in the subject than fleet managers or general managers.

5.5. Prepare certificates for participants of EcoDriving training courses

Certificates for drivers stating what the training was and when and where it took place are easy to produce and might hopefully be put in a visible place like an office wall or a kitchen notice board where they will serve as a reminder to the participant and perhaps encourage questions and interest from colleagues.
5.6. Calculate individual effects on an annual basis

Certificates can also include information about potential annual savings of fuel, money and CO\textsubscript{2}. These figures will be more effective if they are tailored to the individual driver and this is relatively easy to do: If the coach asks and makes a note of each driver’s annual mileage, typical fuel consumption in his own vehicle and fuel type (this is necessary to calculate CO\textsubscript{2} savings), then it is possible to calculate how the percentage reduction in fuel consumption seen on the day of training would translate into annual savings of fuel, money and CO\textsubscript{2}. This information can be added to the certificate.

There will often be plenty of interest and comparison of results when displayed on certificates, which again can help keep EcoDriving at the front of drivers’ minds.

The aggregated results can also be collated into a spreadsheet for the fleet manager showing the potential annual savings for the fleet. As with the certificates, this information should not be presented as the savings that the fleet should now expect to see, but that savings that could be achieved if the percentage improvement seen on the day were maintained for a year.

5.7. Advise how to increase the longevity of benefits

A key question about EcoDriving training is to what extent and for how long the benefits last after training. It usually takes more than a one-time training course to ensure drivers drive efficiently for a longer period of time.

For fleets, the extent of the long term savings will be influenced greatly by related policies and management practices post-training.

Give examples for fleet how they could implement a range of measures to increase the longevity of fuel savings and further benefits. These include periodically providing drivers with reminder information about EcoDriving, monitoring individual drivers’ fuel consumption, producing fuel consumption comparison tables to encourage competition between drivers, offering incentives to reward the most efficient drivers, and additional help and advice for the most inefficient.

Incentive schemes to identify and reward the most efficient drivers needn’t cost much and can be an effective means of promoting EcoDriving. Such incentives are usually organised on a monthly basis and examples include awarding cash or shop vouchers to the most efficient driver, having a favoured high-spec vehicle that’s allocated monthly to the most efficient driver, and funding a monthly social event for the most efficient team.

5.8. Advise to constantly monitor fuel consumption

If drivers are aware of their fuel consumption they will realise the on-going benefits of EcoDriving and are therefore likely to continue to use the techniques. So at the end of the training session and in any literature given to trainees it is good to encourage drivers to take note of their fuel consumption in day to day driving. Most cars and some vans sold today have trip computers that display fuel consumption. The manual alternative is to completely fill the tank and zero the odometer when you’re at a service station. Next time you fill up, completely fill the tank again, noting how much fuel this requires. Also note the odometer reading to see distance driven since the previous fill. Use these two values to calculate average fuel consumption.

Monitor fuel consumption is especially important for private drivers, as there is less scope for directly influencing private individuals’ behaviour in the months and years after training. However, if we can encourage drivers to get in to the habit of monitoring their own fuel consumption then they will remain aware of the benefits of EcoDriving and are more likely to continue employing the techniques. Some suggestions for helping to ‘lock-in’ the benefits of training for both fleet and private drivers are discussed below.

5.9. EcoDriving competitions

One option is to implement EcoDriving competitions, for which the driver(s) using the least amount of fuel for a given trip receives a prize. Celebrities taking part in the competition raise interest both from the audience and the media.
Focus on getting media involved in order to realise articles in relevant journals which are positive towards the EcoDriving idea. A good option is to include journalists or other opinion makers in the competition. A setting which worked well in Austria is to organise an EcoDriving competition between motor journalists and environmental journalists.

5.10. Training for private drivers vs. training for company drivers

Marketing for EcoDriving trainings proves to work well for companies, especially for truck and bus drivers, as fleet managers can easily see that EcoDriving courses have a very short pay-back-period. In contrary, it is very hard to reach private drivers since there are quite a lot of concerns to attend a driving course after having passed the driving exam years or decades ago. The vast majority of drivers are convinced that they are above-average drivers themselves. Moreover, when confronted with EcoDriving tips, many drivers are (falsely) convinced that they follow the EcoDriving rules anyway.

Probably the best possible way to reach private drivers is to get them involved in EcoDriving lessons before they even start driving – by integrating EcoDriving in a comprehensive way into driving education in driving schools. In order to reach this goal, a large number of driving instructors need to be taught in EcoDriving train-the-trainer seminars.

6. Understand the barriers and how to overcome them

6.1. Factors Affecting Driving Style

Driving style is influenced by a complex mixture of technical, social, psychological and cultural factors, with the latter tending to have a greater influence than the former: How a driver reacts to a given situation is more likely to be influenced by factors such as his age, values, social position, concentration, stress and attitude to risk, than by traffic regulations or the driver’s ability to use the vehicle controls. It is more a question of attitude than ability.

EcoDriving trainings therefore need to address behavioural patterns that have been internalised over years and should try to take account of a driver’s social and cultural preconceptions.

6.2. Main obstacles to EcoDriving

The main obstacles deterring people from EcoDriving is the poor level of knowledge about this concept within today’s society or that drivers may suspect that EcoDriving means slower driving with less fun. Most drivers will already have established their own driving style, preferences and prejudices with which they feel comfortable. In many cases these may be at odds with the principles of EcoDriving. This is particularly the case for people that learned to drive decades ago, whose driving style may have been well-suited to older vehicles but is not optimised for modern vehicles and engines.

Furthermore, many drivers assume incorrectly that EcoDriving is easy to put into practice without appropriate practical training and that they are following the EcoDriving rules anyway.

A particular challenge is EcoDriving trainings for truck or bus drivers with decades of experience. These drivers naturally consider them professionals for driving and are very sceptical that trainers could teach them how they might do better in their profession. Sometimes participants of a trainings seminar are opposing the idea of getting trained at all.
6.3. What makes a great EcoDriving trainer?
Of course a good EcoDriving trainer needs to be an expert on the subject and be able to respond on all technical questions and scepticism participants.

However, a good EcoDriving trainer understands how to address the concerns and barriers described above right from the start of the training seminar. The aim is to get participants “on board”, i.e. to motivate them towards the ideas of EcoDriving and ideally to make them EcoDriving ambassadors by themselves.

The trainer’s role is not just to impart information but to understand the trainee’s interests and objectives and to assess what motivates the individual. The trainer becomes an ally and a motivator helping the driver to improve his skills and competences and to achieve his goals.

A good coach will seek to establish whether a driver is there voluntarily or because his employer has sent him on the course, and whether the driver is interested in financial savings, the environment, road safety or developing a smoother and more relaxed driving style. For example, a driver might say he’s not interested in fuel costs as his company pays the bill and he doesn’t believe in climate change, but the coach may realise the driver has a young family and wants to drive as safely and as smoothly as possible. In these circumstances the coach might then focus on anticipation as the key to more economical, safer and smoother driving.

6.4. Success factors for driver trainings for company fleets

- Good training projects should address genuine existing stakeholder needs and offers should maintain a strong focus on the benefits that they can bring to the responsible personnel (i.e. fleet manager, financial director, managing director).

- Practical experience is the best advertisement! It’s a good idea to get the responsible personnel involved from the beginning. You may offer an initial EcoDriving training for free for the managing director and/or the fleet manager.

- Emphasise the importance of practical trainings. In order to really change driving behaviour and save fuel in the long term, it is not sufficient that drivers just try to follow some tips listed, but drivers should also attend an EcoDriving training given by a qualified driving instructor.
7. Involve training programmes for drivers of different vehicles

The most common EcoDriving seminars are for drivers of passenger cars and for drivers of utility vehicles (trucks and buses). These are described in brief below. Further EcoDriving programmes address steering trams, trains, tractors, or construction machines; or even railed vehicles such as trams or railway traction vehicles. Of course, the EcoDriving trainers need to have comprehensive knowledge of and experiences with the vehicles the courses are about.

7.1. Full day EcoDriving trainings for drivers of passenger cars

EcoDriving training courses typically last one full day with four participants per trainer. There are also half-day trainings offered in some countries. However it is not advisable to combine EcoDriving lessons with traffic safety trainings, as practises such as skidding manoeuvres tend to distract the focus of participants away from EcoDriving.

The typical structure of a full-day training is as follows.

**Theory (100 minutes)**
- Awareness of one's own driving style through a questionnaire (questionnaire remains with the participant)
- Elaboration of the contents
- Distribution of documents with main topics
- Discussion points are noted and taken into special consideration during practical training

**Practical training (2 x 100 minutes)**
- 2 or 3 participants in the vehicle (driver + 1 or 2 observers, trainer joins at least for one route per driver)
- vehicle check, specification of route, observation task by observer

**Debriefing 60 minutes**
- Exchange of experience
- Repeating priorities with questionnaire
- Issue certificates

7.2. Short duration trainings for drivers of passenger cars

As full-day trainings sometimes appears to be too time-consuming both for private drivers as well as for fleet managers, short duration trainings are offered as well to reduce the amount of time needed for the training to only one hour per driver, while still providing considerable effects. Such trainings typically last for around one hour per person.

Short-duration EcoDriving training is appropriate for all drivers of cars and vans up to 3.5 tonnes gross vehicle weight. The training is effective for high or low mileage drivers, private individuals or company drivers, and newly qualified or highly experienced drivers. Drivers of heavier vehicles should seek specialist heavy-duty vehicle EcoDriving training.

Short-duration EcoDriving training does not provide sufficient time for a coach to try to convey all that he knows on the subject. The
coach should limit the scope of training to the topics the driver is willing and able to deal with. If the trainer can lay the foundation for self-motivated change in driver behaviour and appreciation of the benefits of EcoDriving then the driver is likely to continue practicing the techniques and will perhaps even seek more in depth training.

The objectives of short-duration EcoDriving training are:

- To convey the three core EcoDriving tips. These are the tips that have the greatest impact on fuel consumption.
- To provide drivers with first-hand experience of ecodriving in real world traffic.
- To give drivers an enjoyable and positive experience as this will make them more likely to apply the tips in their normal driving.
- To promote a safe and efficient driving style in a time and cost-effective way.
- The training may also motivate drivers to opt for longer, more in-depth EcoDriving training.

7.3. Structure of short-duration EcoDriving trainings

In short-duration trainings, each participant drives two laps of an identical route on public roads, the first in his normal driving style and the second whilst being coached and adopting EcoDriving techniques. Fuel consumption is measured for both laps so the trainee can see the improvement for himself. Discussion and two-way feedback is an integral part of the training, so the training should include a brief ‘warm up’ discussion before the driving begins and feedback sessions after both laps.

7.4. The coaching method

One important component of short-duration training – which distinguishes it from other training concepts – is the use of the coaching method. An ECOWILL trainer is educated to act as a coach for the driver, supporting him in achieving an excellent performance in safe, economical and environmentally friendly driving.

Short-duration EcoDriving training does not provide sufficient time for a coach to try to convey all that he knows on the subject. Moreover, the coach’s role is not just to impart information but to understand the trainee’s interests and objectives and to assess what motivates the individual. Overcoming specific objections and deep-rooted concerns of the driver is the key to ensuring that a driver really believes EcoDriving is realistic and practical. If a coach can achieve this, the driver will be far more likely to adopt the techniques in day-to-day driving.

7.5. EcoDriving trainings for drivers of heavy-duty vehicles

EcoDriving trainings for trucks and buses typically last one full day following a similar structure than described for seminars for drivers of passenger cars. The practical training here typically includes maximal two drivers per vehicle and trainer.

There are several ways how to combine theory and practical lessons in the seminar for drivers of heavy-duty vehicles.

It is advisable to include a 3rd trip. The driver is only accompanied here by the trainer as a coach (consolidation level). The participant should be able to implement everything he learned in the second drive independently. The trainer leads mainly with questions.

If the driver has not yet mastered one or the other topic regarding the implementation of economical driving, the 3rd trip offers the opportunity to practice this once again. In addition, parts which were not covered in the second trip can also be practiced during the third trip.
The 1st trip represents the basis of the driver before the training, the 2nd trip contains parts of the training level as well as the strengthening level, and the third trip contains the application level of the driver after the training.

The fuel consumption values of the 3rd run are generally better than those of the 1st run, but usually worse than those of the 2nd run.

After all trips, the trainer and the driver should summarise and repeat the personal focal points for economical driving.

8. EcoDriving with electric vehicles

8.1. Why you should focus on EVs

In recent years, electric vehicles (EVs) have been deemed to be very promising in reducing traffic related energy consumption, pollutant emission and noise. When electricity is produced from renewable energy sources, mobility becomes possible almost without emissions and pollutants.

On the other hand, recent research shows that significant additional energy savings without a loss of time can be achieved when applying EcoDriving techniques which are specifically directed at EVs. In fact, the driving style of electric vehicles has a much stronger influence on energy consumption (and thus the achievable range) compared to vehicles with internal combustion engines. While the fuel reduction potential for conventional cars is generally quantified with 10-15%, an energy reduction of up to 30% can be realistically reached with EVs when applying EcoDriving.

Moreover, energy-saving driving has much more positive effects on electric vehicles than on conventional models, as efficient driving increases the range of vehicles, which is still considered as a major drawback of EVs by potential users. Thus EV EcoDriving training is about range extension as much as anything.

Another substantially positive side-effect of EcoDriving trainings dedicated at use of EVs is that private drivers are also keen on participating in trainings with the new type of vehicle category – a target group that is usually difficult or impossible to reach with previous EcoDriving offers.

8.2. “Undercover” EcoDriving training

Electric vehicles are an excellent option to get private drivers into EcoDriving trainings – without even mentioning the term EcoDriving. Drivers who make their first drive with an EV understand that they need some kind of instruction. There are several aspects at which EVs generally differ from ICE vehicles. Of course, new EV-drivers need to gain knowledge about the new way of charging their vehicle.

EV training needs to be product training as much as EcoDriving training, as drivers want (and need) to know about their EV’s controls, modes and displays, what the eco mode does (e.g. it might reduce the power of the heater and a/c, limit the acceleration etc.) and how to adjust the level of regenerative braking,
Experience shows that using regenerative braking correctly alone results in significant energy reduction and increased traffic safety. However, it’s important to point out that not all EVs are the same. For example, some vehicles have different driving modes that affect the driving experience, the energy consumption and regeneration potential. This means that EcoDriving tips (and training) will be different for different types of EVs.

First-time users are keen on making the best use of their new vehicle, especially on how to reach a maximum possible range. Thus they are keen on knowledgeable and suitable instructions. Trainings given by qualified and certified e-mobility trainers will include not only the specifics of electric vehicles but also teach general EcoDriving techniques, thus influencing driving behaviour also when they are still using a conventional vehicle.

8.3. Get familiar with specifics of EVs which are important for EcoDriving

There are a number of specific techniques of EVs which make EcoDriving slightly different to the techniques applying to conventional fuelled vehicles. It is important that EcoDriving trainers get familiar with this specific knowledge, so further education for EcoDriving trainers is essential.

Specifics of EVs which are important for EcoDriving include the following points:
- Select driving mode
- Avoid “full throttle” position
- Using Recuperation Correctly
- Heating and air conditioning

9. Integration of EcoDriving into driving education for learner / novice drivers

Integrating EcoDriving in driving education from the very start is the best possible way to ensure that more and more drivers – including private drivers who are difficult to reach with EcoDriving marketing efforts – follow EcoDriving techniques on the long term. In this way, driving schools can be seen as the most important ambassadors for energy efficient driving.

While EcoDriving is already more or less part of the theoretical education in driving schools and an European directive makes EcoDriving a mandatory element of the practical examination since 2013, the level of how EcoDriving is taught in driving education differs largely between countries.

To establish a long-term co-operation with associations of driving schools and other important authorities responsible for driving education are essential for a successful national or regional EcoDriving initiative. This should include train-the-trainer programmes for a large number of driving instructors, and possibly driving examiners as well.

The benefits for driving schools which focus on EcoDriving include – except less fuel consumption and less wear & tear for their instruction vehicles – certification and expertise as a promotional factor and competitive advantage and licensed driver training as new business case.

The following conclusions and challenges have been identified in the EU-funded ECOWILL project regarding the successful integration of EcoDriving into driving education:
- EcoDriving has to be mandatory part of the practical examination
- EcoDriving knowledge has to be updated, standardised, and harmonised between instructors and examiners
- Guidance for a systematic implementation in teaching and testing are required
- Instructors need to be aware on didactical methods of conveying specific content to learner drivers
Annex I: Executive Summary for policy makers for framework requirements and recommendations

In order to take advantage of the numerous and diverse benefits of EcoDriving, the THE PEP partnership on EcoDriving emphasises the following core recommendations for decision makers and political representatives.

1. EcoDriving or modern driving fulfils important concerns: more safety and driving comfort, less operating costs and CO₂ emissions. Or in short: more quality of life. With this measure, no expensive investments in infrastructure or new technologies are necessary.

2. In order to establish an EcoDriving initiative in a country, a specific organisation or body needs to be set-up and be responsible for all aspects which are put-together in the guidelines at hand: Compilation of EcoDriving standards and handbooks, set-up a consortium of master trainers, training of driving instructors, evaluation of (pilot) trainings, roll-out of trainings for professional drivers, promotional campaigns for private drivers, possibly subsidising trainings, and integrating EcoDriving into driving education and examination for learner drivers.

3. While EcoDriving is generally easy to apply, it needs to be taught to drivers, who have not adopted EcoDriving yet, in a qualified way. Such EcoDriving trainings for licensed drivers shall be given by experienced and qualified driving instructors and must include driving on public roads and the use of driving monitoring devices giving direct feedback on fuel consumption.

4. As marketing for EcoDriving trainings proved to work well for companies, trainings for licensed drivers should focus in the beginning on company fleets, targeting bus and truck drivers in particular due to the high fuel consumption and high mileage of those vehicles.

5. The modern and correct operation of vehicles, including the core EcoDriving techniques, shall be fundamentally integrated into driving education and driving examination for learner drivers. The best way for this is that EcoDriving is instructed right from the beginning of driving training. With this approach, more and more private drivers, who are otherwise hard to be motivated for driving trainings, will apply EcoDriving.

6. EcoDriving needs to be considered as the only one correct and recommended driving style, which is also energy-efficient. It should not be seen as a contrast to “classic” or ordinary driving but as a driving style which is feasible for all drivers, all vehicles and all traffic conditions.

7. Today state-of-the-art engine technology simplifies driving. EcoDriving shall be considered as modern driving style which suits modern engines and advanced vehicle technologies.

8. Furthermore, EcoDriving should be included in official long-term national policies or strategies to ensure the longevity of the initiative.

9. A special focus should be laid on EcoDriving for electric vehicles as a perfect way for range extension. EV training needs to be product training as much as EcoDriving training, as drivers want (and need) to know about their EV’s controls, modes and displays, e.g. how to make best use of regenerative braking.

10. EcoDriving has to be put back on the priority list of European research programmes in order to facilitate exchange of know-how, transfer experiences to starter countries and further develop EcoDriving to new vehicles such as EVs.
Annex II: Overview on websites, handbooks and literature

To be inserted in the final version of this guidelines.

Annex III: Links to established European EcoDriving programmes

To be inserted in the final version of this guidelines.

Contact THE PEP Partnership on EcoDriving

If you are interested to learn more about establishing EcoDriving programmes, to exchange experience or to join the partnership, specific programmes etc., please contact THE PEP partnership on EcoDriving:

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