Short Duration Training (SD-Training)

ECOWILL – Level 2

Handbook for Trainers
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1. Objectives of the "Short Duration Training (SD-Training)"

In contrast to Ecodriving trainings of several hours or even a full day’s duration, the "Short Duration Training" is not designed to convey the whole range of techniques of safe, economical and environmentally friendly driving. It can be assumed that the participants have already heard or read about Ecodriving driving techniques before the training.

The "Short Duration Training (SD-Training)" pursues the following objectives:

- The SD-Training introduces the three Ecodriving core tips with the highest impact on fuel saving.
- The SD-Training offers first experiences in practicing the Ecodriving core tips in real world traffic.
- The SD-Training guarantees positive experiences when applying the tips. In this context, sometimes less is more. The coach has to ensure this.
- The SD-Training serves as teaser and mind-opener for the new driving style.
- The SD-Training shall motivate the coachees to opt for more intensive, longer Ecodriving trainings.

Resulting from the above-listed objectives specific learning targets for each phase of the SD-Training are defined as follows:

**General**

The participant shall practice a limited selection of driving techniques with high impact on fuel savings.

**1. Warm-up phase**

- The coachee is to be welcomed by the coach in a warm and friendly way, generating a trustful atmosphere right from the beginning.
2. First ride
- The first ride only serves observation purposes. The coachee is given the opportunity to get used to the car and the chosen route, showing individual Ecodriving capabilities without any further pressure. Once used to the circumstances, the coachee is enabled to focus on practicing the driving techniques in the second ride.
- The coach has to establish a trustful relationship with the participant, thus increasing the training effects.
- The coach has to get himself a comprehensive picture of the coachee’s capabilities and the individual improvement potential.

3. First feedback phase
- The first feedback phase shall encourage the participant. Therefore, the coach positively points out the Ecodriving techniques or elements, the coachee already showed in the first ride.
- The coachee must realise that it is on him to reach the envisaged successful training results.
- The participant shall decide by himself (guided by the coach) which tips he wants to try out. A complete coverage of all tips is no priority!
- The coach supports the participant in creating a personal training plan, advising specifically which techniques to practice for best results. This training plan may not overstrain the driving capabilities of the coachee.
- The coach asks the participant what kind of support he wishes during the second ride (before a situation occurs, in the situation, after the situation passed or an in-the-mix solution).

4. Second ride
- At the beginning of the second ride the participant shall focus on practicing only few or just one single Ecodriving tip to avoid overstraining. The coach has to be very sensitive assessing the situation. The training intensity may be increased by the coach, but only jointly with the coachee and without overloading the training. Creation or reinforcement of restraints against tips or the training itself or specific parts of it must be thoroughly avoided.
5. Final feedback phase

- During the final feedback phase, the participant is to assess his training success from his point of view.

- The coach gives positive feedback on the coachee’s performance.

- The participant gets feedback on his individual savings.

- The participant shall be motivated to continue practicing the tips on his own. Therefore, he shall go through his customized training plan. Additionally, he shall get motivated to opt for more extensive follow-up trainings.
2. Target Group for the "Short Duration Training"

The practical Ecodriving training on public roads is designed for experienced drivers of passenger cars/ category B, not exceeding 3.5 t GVM\(^1\).

Participants may be high or low mileage drivers, young or experienced drivers, private or business drivers. This illustrates the broad spectrum of driving experiences and individual driving behaviour patterns the coaches may be confronted with in the SD-Training. All drivers have established their own behavioural patterns, preferences, driving styles and learning strategies and feel comfortable and happy with it. Especially drivers who built up their knowledge and experience on cars with carburettor technology, have internalised driving techniques which were indeed right some time in the past, but are not adequate anymore in the light of recent engine and vehicle technology. The coach has to be prepared being confronted with reservations against the new driving techniques.

It often occurs that participants have the apprehension that the training is hidden examination of their driving skills. This is one of them main objections to attend a training in the first place. The coach has to counteract against this impression in a sensible way right from the beginning.

Some examples of such objections, based on the evaluated experiences of participants, shall be discussed in the following. All of them have in common that they can hardly be refuted by theoretical argumentation, which underlines the necessity to counter them during practical training.

The tip "Anticipate traffic flow, enlarge safety distance and make best use of the vehicle’s momentum" induces the apprehension that an increased safety distance invites other cars to jump into the enlarged gap, forcing the driver to slow down to adjust the distance again. In consequence, this would result in standstill. This fear cannot be ruled out in a theoretical discussion since it is based on subjective attitudes and images. The tip is only comprehensible if practised under real world traffic conditions disproving this argument as pointless.

At the same time, many drivers think that it is not appropriate to drive the car in neutral (no gear engaged with idling engine), since it was not possible anymore to escape from potentially dangerous situations. Nevertheless, the same drivers admit that they never encountered such a situation. Many already practice this tip to a limited extend in their everyday driving when going into neutral on the last meters approaching a red traffic light.

\(^1\) Gross Vehicle Mass.
The coach must address both points when confronted with those critical remarks and advise to try it out in practice.

For two reasons the tip "Maintain a steady speed at low RPM" is often seen sceptical. The one is, that drivers think, driving with low RPM was bad for the engine. This is based on experiences with carburettor cars. Other than with this technology, the accelerator pedal position in modern cars is NOT necessarily correlated to engine´s fuel consumption.

The second reason is that many drivers think, low RPM meant driving slowly and thereby obstructing the traffic flow. This counter-argument against Ecodriving is also very hard to dispel in theory. The participants must experience the truth in real world training sessions where they are shown that they are neither getting slower nor obstructing traffic nor attracting attention by practicing this tip.

The coach must be highly sensitive for such restraints and prejudices. To find out about it, he can work with specific questions as described in chapter 4, where the method of coaching is explained in detail.
3. The GDE-Matrix (Goals for Driver Education) as Background

The so called "GDE-Matrix" (Goals for Driver Education) deals with all relevant factors and targets that a harmonised European driving school education must comprise according to the GADGET-experts\(^2\) from eight different countries, describing what makes a good driver.

The first 4 levels show, that driving consists of technical and social and psychological dimensions with the latter having the bigger impact on driving behaviour. Participating in traffic is not primarily determined by rules or learned behaviour, but underlies psychological and social factors which severely and spontaneously influence and modify driving behaviour. Conveying and reinforcing behavioural patterns accepted as useful helps to avoid that external factors can cause such rapid changes.

In 2010, an additional 5\(^{th}\) level comprising cultural and work-related influences was introduced. This 5\(^{th}\) level is considered as additional influencing variable to the already existing 4 levels.

**GDE-Matrix**

(Hatakka, Keskinen, Glad, Gregersen, Hernetkoski, 2002)

<table>
<thead>
<tr>
<th>Goals for life, skills for living</th>
<th>Knowledge and skills</th>
<th>Risk-increasing factors</th>
<th>Self assessment, introspection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lifestyle, age, social position, values</td>
<td>Sensation seeking, peer pressure, risk acceptance</td>
<td>Risky tendencies, impuls control</td>
<td></td>
</tr>
<tr>
<td>Goals and context of driving</td>
<td>Role of motives, route planning, choice of time</td>
<td>Alcohol, fatigue, purpose of driving</td>
<td>Own motives, self critical thinking</td>
</tr>
<tr>
<td>Traffic situations</td>
<td>Traffic rules, observation, driving path, automatisation</td>
<td>Disobeying rules, information overload</td>
<td>Awareness of personal strengths and weaknesses</td>
</tr>
<tr>
<td>Vehicle control</td>
<td>Control of direction, position, physical laws</td>
<td>Unsuitable speed, difficult conditions</td>
<td>Calibration and awareness of car control skill</td>
</tr>
</tbody>
</table>

\(^2\) See EU-Project GADGET, Final report (http://www.kfv.at/fileadmin/webcontent/Publikationen_englisch/GADGET_FinalReport.pdf)
Moreover, the GDE-matrix also shows the limitations and difficulties for learning processes aiming to change behavioural patterns internalised over years. Ignoring these aspects, a training may fail establishing positive effects.

Driving techniques like early shifting, letting the car roll and enlarging the safety distance are mainly "hard knowledge" how to handle the car and specific driving situations on levels 1 and 2. If those driving techniques shall be accepted by the coachees, the corresponding willingness of levels 3 and 4 ("soft knowledge") has to be given. For example, it is hard to motivate the participant to let the car roll in neutral, if he considers it as forbidden or wrong, based on what he learnt in the course of his own driving education years ago.

GDE-Matrix as support

Taking the cultural and work-related influences of level 5 into account, to ignore these restraints may result in complete confusion in communication, since the tip may even contradict legal regulations in some countries.

Similar difficulties occur when addressing the tip "shift up early". Some participants think that the engine became sooty by driving and shifting at low RPM. Most experienced drivers do not know, that this technique is harmless to modern engines, as it was not common knowledge by the time they got their drivers license.

The tip "switch-off engine at longer stops" often causes heavy concerns based on the fear the engine might not start again. The emotion of fear effects, that necessary changes in behaviour are being strictly rejected.
Similar restraints occur if participation is not voluntary, but demanded by the employer, with professional drivers as coachees regarding themselves as accomplished driving experts completely in control of traffic.

The coach must be highly sensitive for such restraints and objections and take care, that specific tips in particular or the training in general are not being rejected.

Therefore, it is important to gather respective information during the "warm-up phase" or by small talk during the first ride using specific questions. The following key questions are examples how to get the information required:

- Why do you participate in a SD-Training?
- What are your motives to participate in a SD-Training?
- Since when do you own your driver's license?
- What car are you currently driving?
- What kind of cars did you already drive?
- What purposes do you use your car for?
- What do you enjoy the most when driving?
- What does your every-day driving consist of?
- What gets on your nerves regarding driving?

The GDE-matrix and its effect factors underline that it is not a primary target of the SD-Training to convey the complete accumulated knowledge to the participants and being very active as a coach. It is more effective to do less (and thereby achieve more), addressing only topics the coachees are willing and capable to deal with.

If thereby the foundation for a self-motivated change in driving behaviour and the adoption of Ecodriving tips is laid, the objectives of the SD-Training are fulfilled. Then, the participants will go on practicing Ecodriving by themselves or even attend further trainings.

It is completely counter-productive if a coach uses his knowledge to make his personal mark.
The GDE-Matrix 2010

Proposal was based on a five-level GDE5-SOC matrix (Keskinen, Peräaho & Laapotti, 2010)

5 Social environment
e.g. culture, legislation, enforcement, subculture, social groups, group values and norms

Influencing, shaping

4 Personal goals for life, skills for living
e.g. lifestyle, motives, values, self-control, habits, health

Seeking, selecting

3 Goals and context of driving
e.g. trip related choices, goals, driving environment, company

2 Mastery of traffic situations
e.g. rules, observation, driving path, interaction

1 Vehicle handling and manoeuvring
e.g. gears, controls, direction, tyre grip, speed adjustment

PERÄAHO, KESKINEN, LAAPOTTI, KATILA, HERNETKOSKI 2010
## Trend in driver training contents

<table>
<thead>
<tr>
<th>Hierarchical levels of behaviour</th>
<th>Essential curriculum</th>
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<tr>
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<td>Knowledge and skills</td>
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<td>Goals for life and skills for living (general)</td>
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<tr>
<td>Driving goals and context (journey-related)</td>
<td></td>
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<tr>
<td>Mastery of traffic situations</td>
<td></td>
</tr>
<tr>
<td>Vehicle manoeuvring</td>
<td></td>
</tr>
</tbody>
</table>

(by Keskinen and Hatakka, 1997)
4. Coaching as Method of the "Short Duration Training"

Coaching is the professional counselling and attendance of a person (the coachee) by a coach, while the person is exercising complex actions. Aim is to enable the coachee to achieve his personal optimum result.

The term "coach" means a horse-drawn carriage getting people from one point to another. In this respect, on the meta-level coaching can be seen as "development tool". The target is defined by the coachee who is accompanied by the coach on a specific journey, for example leading to a better use of the car’s momentum. The coach is not a schoolmaster nor an examiner to the coachee. Therefore, the coach must avoid communicating any negative rating of the coachee.

The term "coach" in this meaning was initially used in sports, where the coach is not only a trainer of skills but also partner and motivator. In the first place, a coach is the trainer of the mental strength of sportsmen. As neutral partner in communication and interaction, the coach shall enable, accompany and facilitate the coachee’s individual development process.

Increasingly, coaching is practiced in management and marketing, but also in personal context. Triggered by expert suggestions, specific actions are assessed under real-world conditions and better alternatives jointly revealed. Coaching is the most effective way to lead the coachee to his personal optimum, maybe even a top performance.

Regarding road traffic and especially car-driving, coaching requires the consideration of the full context of driving from the coachee’s real-life point of view. Driving a car is not isolated, but strongly correlated to contextual conditions (see GDE-matrix). Here, the task of the coach is to support the coachee in achieving a good performance in safe, economical and environmentally friendly driving.

Coaching is characterised either by intensive evaluation of experiences made using specific key questions or slowly acquainting the coachee to new behaviour by asking for ideas or first impressions/ experiences. In this sense, especially in further education of drivers, situations can be customised, activating the participant, allowing important first impressions and triggering further-leading interactive involvement. Role of the coach is not to represent a "knowledge pool" but to incorporate an interested companion, allowing the coachee to find his own way by the help of sophisticated questioning. The key principle of coaching is partnership.
A variety of techniques can be used to enter the subject, but they all serve the same purpose to initialize personal involvement by finding own answers.

In particular, the coaching method intends to get information on the participants’ background, experiences and motives. As already mentioned in chapter 2, there are big differences regarding the coachees’ motives to participate. To gain deeper insight, here are some helpful examples for specific key questions:

- What made you attend the SD-Training?
- What are your expectations regarding the SD-Training?
- What are your expectations for today?
- What would you like to train?
- How did the training come to your attention?
- What are your motives to participate in the SD-Training?

Find and jointly define targets

After the first ride follows a feedback phase, in which a personal training plan is to be established (see also chapter 6). To jointly define its targets, the following key questions are useful:

- Which core tips do you want to try out?
- Which core tips do you already know?
- Which core tip would you like to learn more about?
- What contents would you like to try out?
- How would you like me to support you?
- What are your expectations on me?
- How can I support you best?
- What are the goals you want to reach by the end of the training?
- What needs to be achieved, so you would call this a successful training?
- Which result do you envisage by the end of the training?
5. The "Golden Rules" of Ecodriving as defined in the ECOWILL project

Ecodriving is the modern and smart way of to save fuel and reach your destination swiftly and – most important – safely.

Consuming energy/fuel costs money and causes CO$_2$ emissions with negative environmental impact. Especially driving with high engine revolutions (high RPM) raises the fuel consumption significantly. Also avoidable sequences of acceleration and braking as well as inappropriate use of air conditioning and electronic equipment will lower fuel efficiency.

Following the guideline "Safety First", the application of Ecodriving tips listed enables a highly fuel-efficient, smart and relaxed driving style with best environmental effect.

1. Anticipate Traffic Flow
   - Read the road as far ahead as possible and anticipate the flow of traffic.
   - Act instead of react – increase your scope of action with an appropriate distance to use momentum$^3$.
   - Make maximum use of the vehicle’s momentum$^4$.

   $^3$ An increased safety distance equivalent of about 3 seconds to the car in front optimises the options to balance speed fluctuations in traffic flow, enabling steady driving with constant speed (see also additional explanation #1).

   $^4$ Three different techniques are applicable (within 2 categories: (a) with traction; (b) without traction) – consider details of the car’s manual (see also additional explanation #2).

2. Maintain a steady speed at low RPM
   - Drive smoothly, using the highest possible gear at low RPM$^5$.
   - Remember driving at high speeds or with high RPM significantly increases fuel consumption$^6$.

3. Shift up early
   - Shift to higher gear at approximately 2,000 RPM.
   - Consider traffic situation, safety needs and vehicles specifics$^7$.

   $^5$ See also additional explanation #3.1.

   $^6$ See also additional explanation #3.2.

   $^7$ See also additional explanation #4.
4. Check tyre pressures frequently, at least once a month and before driving at high speed

- Keep tyres properly inflated as low tyre pressure is a safety risk and wastes fuel.

5. Consider any extra energy required costs fuel and money

- Use air conditioning and electrical equipment wisely and switch it off if not needed.
- Avoid dead weight and aerodynamic drag.

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8 For correct tyre pressure (acc. to loading and speed driven), check with car’s manual.

9 Electrical energy is converted from extra fuel burned in a combustion engine, so electrical consumers don’t work “for free” – it always extra energy and money.
Golden Rules of Ecodriving (version: April, 28th 2011)

Ecodriving is the modern and smart way of to save fuel and reach your destination swiftly and – most important – safely. Consuming energy/fuel costs money and causes CO₂ emissions with negative environmental impact. Especially driving with high engine revolutions (high RPM) raises the fuel consumption significantly. Also avoidable sequences of acceleration and braking as well as inappropriate use of air conditioning and electronic equipment will lower fuel efficiency. Following the guideline “Safety First”, the application of Ecodriving tips listed enables a highly fuel-efficient, smart and relaxed driving style with best environmental effect.

- Anticipate Traffic Flow
- Maintain a steady speed at low RPM
- Consider that any use of energy costs fuel and money
- Shift up early
- Check tyre pressures frequently at least once a month and before driving at high speed
Additional Explanation #1:

Systematically increasing vehicle-to-vehicle distance within traffic flow significantly improves overall road safety. Increased safety distance equivalent of around 3 seconds to a vehicle driving ahead optimises options to act instead of only react and reduces risky situations.

Key action: Step off the accelerator if traffic flow is slowing down to keep safety distance. With this simple action speed fluctuations in traffic can often be equalised and gently managed. As a result (strong) braking – while wasting built-up kinetic energy – can be often avoided as well as the need to accelerate after too hard deceleration.

Additional Explanation #2:

Making use of vehicles' momentum means to use built-up kinetic energy of the car most efficiently. The overall goal is letting the car roll and driving steady speed whenever possible instead of braking and subsequently accelerate.

Using vehicles momentum three different techniques are applicable – classified in two categories. It is important to consider specific advices of the individual car's manual as well as strictly follow national legal requirements.

Using momentum can be realised within two different categories of driving techniques: (i) in gear, (ii) in neutral – resulting into three specific advices.

Category #1 "using momentum in gear”

Driving advice technique #1: Let the car roll in gear

The speed of the vehicle will reduce due to the engine's braking effect via mechanical friction (as gear engaged). Using the right gear unintended acceleration (e.g. while driving downhill) can be avoided. This technique is beneficial to saving fuel if the respective engine has a fuel cut-off mode and also while driving at higher speeds (consider advice for engine’s fuel cut-off).
Category #2 "using momentum in neutral"

Driving technique #2: Let the car roll in neutral (no gear engaged with idling engine)

The technique rolling in neutral with no gear engaged (with idling engine) makes better use of a vehicle’s kinetic energy because there is no engine braking effect. This is beneficial for situations like approaching an obstacle or an identified stop (red traffic lights; Stop-sign). Thus, a relative long distance can be driven at quite constant speed without additional acceleration. While rolling in neutral the fuel consumption is defined by the idling engine alone. Especially for cars without engine fuel cut-off mode this is a good technique to use vehicle’s kinetic energy. But also for cars with fuel cut-off the option to letting the car roll without gear engaged can save fuel at typical low speed driving in cities (esp. when "stop-and-go" or only little faster). Engine's fuel cut-off does not work at low RPM (check with the car's manual for details), and is activated beyond a specific engine speed for the individual car. For safety reasons while driving downhill it is important to always stay in the right gear to avoid unintended acceleration.

Driving technique #3: Letting the car roll in gear, but with clutch disengaged

This technique is advisable in situations when it can be assumed that the ride can be continued soon in the same gear, and the use of the engine's fuel cut-off and engine braking effect is not useful for good fuel efficiency.

Consider: Make use of the engine's fuel cut-off whenever useful

It is important to know that inner mechanical friction (of engine/ transmission) wastes more kinetic energy than letting the car roll without traction (no gear engaged or clutch disengaged). Engine fuel cut-off (if available for a specific car) operates only at certain speed range and revs area which differs from car to car. It is useful to know the car's specifics as from the owner's manual. At low RPM and low speeds (below 50 kph) – as typical for driving in cities – the use of the engine's fuel cut-off is not always possible and useful. Especially for city driving it can be extremely difficult and distracting – safety risk! – to identify the right gear for making best use of the engine's fuel cut-off. Relevant for safe driving is the fact that some modern cars accelerate automatically if the car falls below a specifically defined (engine) speed. This effect – if unintended – should be avoided because it raises fuel consumption and may lead to driver's irritation (road safety issue). Older cars mostly have no engine fuel cut-off mode.

Note: All three techniques are to be applied strictly following the guideline "Safety First".
**Additional Explanation #3:**

3.1. Smooth driving with steady speed saves a lot of fuel compared to the same average speed, but with sequences of acceleration and braking.

Unnecessary speed peaks and abrupt braking do not only waste fuel, but also raise the stress level while driving and causing additional safety risks. Ecodriving strives for a smooth driving style allowing undisturbed, easy floating within traffic.

Using a cruise control can be advisable to support a smooth ride, especially for extra-urban driving (rural roads or highways), but also some traffic situations in city driving.

3.2. High speed driving leads to a drastically increased fuel consumption

Especially for city driving there is nearly no chance to increase average speed or gaining time advantage with strong acceleration and speed peaks. The time you need for a ride is dominated by external factors (like traffic density, traffic lights, etc.). Even on highways the time saving potential is quite low and has to be (over-)paid with drastically increased fuel consumption. Even getting a little bit faster means higher RPM plus aerodynamic drag, even within speed limits (e.g. 110 to 120 kph), and more fuel has to be burned and money wasted (see on-board vehicle computer).

**Additional Explanations #4:**

1. Driving with high or even medium engine RPM always consumes more fuel than driving at low RPM at whatever speed. Therefore, early shifting is highly recommended. However, vehicle specifics and also given traffic situation has to be taken in account.

Rough guidance for shifting and steady speed driving (on the flat, not uphill):

<table>
<thead>
<tr>
<th>Gear</th>
<th>Speed (kph)</th>
<th>Fuel Consumption (l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>Driving-off only (one vehicle length)</td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td>20</td>
<td>7.0</td>
</tr>
<tr>
<td>3rd</td>
<td>30</td>
<td>4.6</td>
</tr>
<tr>
<td>4th</td>
<td>40</td>
<td>3.8</td>
</tr>
<tr>
<td>5th</td>
<td>50</td>
<td>3.4</td>
</tr>
<tr>
<td>6th</td>
<td>60+</td>
<td></td>
</tr>
</tbody>
</table>

Based on the rough guidance for steady speed driving (on the flat, not uphill) the optimum gear shifting for each car has to be identified individually.
Full throttle acceleration should be avoided if the acceleration can be chosen individually. When driving uphill choose a gear which does not require fully pushing down the accelerator to keep an acceleration reserve (safety issue). As appropriate accelerator pedal position 2/3 or 3/4 should be chosen.

**Note:** "Safety First" guideline also applies for acceleration! For strong acceleration required (e.g. overtaking, lane changing, driving onto a highway) use intentionally full throttle acceleration "pedal to the metal" to quickly achieve the speed envisaged and safely manage the specific situation.

When accelerating stronger skipping gears can help to save fuel. Skipping gears is meaningful and fuel-efficient to reach faster a targeted final (steady) speed and keeping it for a longer time.

Engine torque curves of diesel and petrol cars differ strongly, also when comparing older and advanced engines in general (irrespective of fuel sort). Cars with diesel powered engines or advanced direct injection gasoline engines can be shifted up at even lower RPM than (older) petrol powered cars.

**Specific advises for automatic transmission:**

To drive fuel-efficient avoid kick-down to accelerate excepted when it is required for safety reasons (see above).

To intentionally shift up and ride with lower RPM with automatic transmission simply step-off the accelerator shortly.

Shifting and driving at low RPM is harmless to any engine or car! Overloaded/blocke! particulate filter of diesel cars do not result from driving with low RPM, but relate to low engine temperature at too many short trips (also to be avoided due to high fuel consumption). If necessary a 10 minute lasting highway ride can prevent blocking the particulate filter. Please also see details and practical instructions in the car's manual or from car manufacturer directly. In general it is advised to select and buy a car that fits to the use pattern and trip structure.
"Silver Rules" of Ecodriving:

1. Avoid short trips! Cold engines need much more fuel compared to warmed-up engines and causing equivalently more CO$_2$. On short trips the engine does not reach its optimum operating temperature, engine increasing wear and reducing durability.

2. Drive-off immediately after starting the engine; do not warm up the engine by idling.

3. Do not push the throttle while starting the engine.

4. Switch-off the engine at longer stops (or use the automatic "start/stop") – when expected to last longer than 20 seconds (ignition on).

5. Close windows while driving at higher speeds, as open windows increase aerodynamic drag and consume extra fuel.

6. Use low friction oils and low energy tyres (EU labelling).

7. Check your car regularly and have it serviced to keep it "eco-fit" and also "safety-fit".

8. Fuel-saving starts with choosing a low emission car.

9. Choose a fuel-efficient model with reduced CO$_2$ emissions. Diesel vehicles should always be equipped with particulate filters. A fuel consumption display helps you save fuel. Cruise control and an advanced automatic gearbox can decrease fuel-consumption.


11. Around 25% of all car trips are less than two kilometres and 50% of car trips are less than five kilometres. Cycling and walking do not only have positive effects on the environment but also on your health and budget. The use of public transport also helps you save money avoiding stress and emissions. Consider setting up a car pool with friends/colleagues or try car sharing to save fuel and reduce costs.
6. Prototypical Course of the “Short Duration (SD) Training” for licensed drivers

<table>
<thead>
<tr>
<th>Time</th>
<th>Phases/ Contents/ Procedures</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation</td>
<td>Resetting vehicle’s on-board trip computer (average fuel consumption mode). This can also be done in the presence of the participant. If the car of the participant is used the participant should do it himself</td>
<td>Have the “roadmap” ready displaying the round course in detail. The coach needs to know the round course</td>
</tr>
<tr>
<td></td>
<td>Arrival of the coachee</td>
<td>Friendly welcome</td>
</tr>
</tbody>
</table>
| 4-5 Minutes   | **Warm-up**  
Explanation of structure and objectives of the SD-Training;  
Describing the role of the trainer as personal coach supporting the participant in achieving his own goals;  
Check of seating position and mirrors.  
Explanation of the relevant board computer displays (only if it is not the car of the participant!!) | Hand over the “roadmap” and explain it. If necessary, comment on the specific powertrain (engine & transmission) or fuel of the car employed                                                             |
| 15-20 Minutes | **First Ride** on a defined round course recording all relevant data. The coach only helps to find the track, but conveys no tips (interventions in risk situations are of course allowed).  
The coach is to get a complete overview on driving style, capabilities and Ecodriving behaviour of the participant: strengths and weaknesses.  
The coach assesses the coachee’s improvement potential.  
At the end of this first ride the average fuel consumption has to be checked and laid down.  
**NOTE:** The on-board trip computer (fuel consumption mode) has to be resetted again before starting the second ride! | First ride also serves to establish a trustful atmosphere. Small talk on subjects not directly related to Ecodriving are a good way to achieve this.  
**NOTE:** Despite being asked to drive in their every-day manner, participants tend to pretend, that they already practiced Ecodriving to impress the coach. |
| 5-10 Minutes  | **First Feedback Phase** in the car in standstill: Feedback on first ride and agreement on a personal training plan. Ask the participant, how he/she felt during the first ride and if the individual goals were achieved. A self-assessment on a scale 0 to 10 (0 = lowest score; 10 = highest score) is helpful. Ask the coachee for the reasons to come to these conclusions. | The trainer is coach, which means that personal goals of the coachee have to be supported. This must be reflected in the customised training plan. |
### Time Phases/ Contents/ Procedures Remarks

<table>
<thead>
<tr>
<th>Time</th>
<th>Phases/ Contents/ Procedures</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>15-20 Minutes</td>
<td><strong>Introduction of the Ecodriving Core Tips of the SD-Training (acc. to &quot;Golden Rules&quot;):</strong>&lt;br&gt;1. Anticipate Traffic Flow, enlarge safety distance and make best use of the vehicle's momentum.&lt;br&gt;2. Maintain a steady speed at low RPM driving smoothly.&lt;br&gt;3. Shift up early</td>
<td>The targets are defined jointly. Recommended behaviour which is seen critical by the coachee must not be trained. It is of particular importance, that the coachee gathers positive experiences during the training, so he/she is encouraged to continue checking and optimising the individual driving style after the training. Complete coverage of all tips is not necessary. Priority is to positively experience the selected tips.</td>
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<tr>
<td></td>
<td><strong>Second Ride</strong> on the defined round course recording all relevant data. The coachee is trained according to the agreed personal training plan.</td>
<td>In order not to overstrain the coachee’s attention, safety advice shall only be given if unacceptable risks arise. <strong>NOTE:</strong> &quot;Safety first&quot; is key principle throughout the entire SD training. Trade-offs &quot;safety vs. fuel economy&quot; are unacceptable!</td>
</tr>
<tr>
<td>5 – 10 Minutes</td>
<td><strong>Second Feedback Phase and Training Wrap-up</strong>&lt;br&gt;The coachee shall describe his feelings in the training, supported by key questions like the following:&lt;br&gt;  o How did you feel during the second ride?&lt;br&gt;  o How do you assess the result?&lt;br&gt;  o How did you experience the second ride?&lt;br&gt;  o What was easy to put to practice and what seemed difficult? Please explain why.</td>
<td><strong>IMPORTANT NOTE:</strong> All comments must be positive in order to increase the coachee’s motivation for further self-reflection and practicing.</td>
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**Training duration:** 45 - 60 Minutes
7. Goals of Trainer Education – Level 2

The Level 2 Train-the-trainer Seminar of at least a full day’s length ensures:

- The trainers further educated within the European "ECOWILL" project have a common understanding of the "Golden Rules of Ecodriving" as defined in the project.
- The participants are informed about facts and background of the EU-project "ECOWILL".
- The coachees know and understand the GDE-matrix and are capable to correctly assess the effect factors.
- The coached trainers know the structure of the SD-Training and understand its didactics.
- The participants of the Level 2 Seminar learn the coaching method and are being enabled to apply it.
- Each participating trainer conducts/ practices warm-up phase, both feedback phases and both training rides in the role of the coach under supervision and with the feedback of the other coachees.

Main objective is, that the coachees learn how to gather the necessary information during warm-up phase and first ride (including the conversation in its course) to set up an appropriate personal training plan in cooperation with the coachee. In particular, trainers with Ecodriving training experience (several-hours or whole-day trainings) shall realise, that there is no use making a personal mark with their knowledge. Instead, the coach has to sharpen his/ her sensibility to be able to reduce the training contents as much as necessary in order to effect only positive experiences. Information overload in the SD-Training causes nothing but negative unpleasant effects. This must be avoided as well as safety trade-offs for the sake of better fuel economy – Safety first!

Some already experienced trainers may tend to shorten the practical training segments in favour of a more detailed theoretical discussion but this has proven counter-productive. Especially the first ride is very important to establish a feeling how to generate a positive atmosphere in the car and how to gather information instead of spreading it. The SD-Training must be experienced throughout all its phases to see which potential is given and how to gain the necessary information.
8. Prototypical Course of the Trainer Education Seminar – Level 2

Introduction

ECOWILL has various objectives. Creating an offer to licensed drivers (category B/BE) to practice and train Ecodriving on public roads is one of its major targets. To make the training attractive, it was given the form of a customisable 1:1 course (one coach, one coachee) with a short duration (max. 1 hour).

Attendance of the Level 1 Seminar (or acknowledged equivalents in advanced countries) is necessary condition to participate in the Level 2 Train-the-Trainer Seminar. The Level 2 seminar provides information on the didactic concept of the Short Duration Training (SD-Training) and teaches how to implement it in the right way. Moreover, the Level 2 seminar enables to develop and implement strategies/guidelines how to approach specific target groups of licensed drivers of category B/BE.

Foundation of the training implementation is the GDE-Matrix in its recent 5-Level form:

- Technical aspects: see GDE-Level 1 + 2
- Social aspects: see GDE-Level 3 + 4
- Cultural aspects: see GDE-Level 5

All GDE-Levels affect the seminar. Levels 1 - 4 are important for the education of the driving instructors by the Master-Trainers, Level 5 is relevant concerning the seminar structure and the DVR approach.

Targets of Level 2 Seminar

1. The driving instructors/ Master Trainers shall understand and be able to implement GDE-Matrix in accordance with its purposes.

2. The driving instructors/ Master Trainers shall know background and facts of ECOWILL and the driving techniques.

3. The driving instructors/ Master Trainers shall know the contents and the addressed driving techniques of the SD-Training and be able to apply that on public roads.

4. The driving instructors/ Master Trainers shall know various strategies and methods to even work with highly sophisticated drivers.

5. The driving instructors/ Master Trainers shall know possible acquisition and implementation strategies for the Short Duration Training.
## Organisational structure of the full-day train-the-trainer seminar – Level 2

<table>
<thead>
<tr>
<th>Time</th>
<th>Contents</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>60 Min.</td>
<td>Introduction&lt;br&gt;Organisational issues&lt;br&gt;History of ECOWILL&lt;br&gt;Participants’ expectations&lt;br&gt;Participants’ Ecodriving experiences so far</td>
<td></td>
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<tr>
<td>30 Min.</td>
<td>Didactical structure of the Short Duration Training&lt;br&gt;Description of the Ecodriving techniques relevant in the SD-Training</td>
<td>Ecodriving Core Tips of the SD-Training (acc. to &quot;Golden Rules&quot;):&lt;br&gt;1. Anticipate traffic flow, enlarge safety distance and make best use of the vehicle's momentum.&lt;br&gt;2. Maintain a steady speed at low RPM driving smoothly.&lt;br&gt;3. Shift up early.</td>
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<tr>
<td>30 Min.</td>
<td>Pedagogical background for training licensed drivers</td>
<td></td>
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<tr>
<td>150 Min.</td>
<td>Practical Short Duration Training&lt;br&gt; Observation&lt;br&gt; Measuring fuel consumption&lt;br&gt; Theoretical input&lt;br&gt; Purposeful instruction&lt;br&gt; Discussion of Evaluation</td>
<td>6x20 min. of driving, either coached by Master-Trainer or the group in the car.&lt;br&gt;Additional 6x5 min. &quot;buffer time&quot;</td>
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<tr>
<td>60 Min.</td>
<td>Consequences for future acquisition/implementation of the SD Training</td>
<td></td>
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<tr>
<td>30 Min.</td>
<td>Final Q &amp; A session</td>
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### End of seminar:

1. Standardised qualification test.
2. Awarding of the certificate.
3. Final wrap-up and goodbye to certified SD-Training coaches.

The two main objectives of the EU-project ECOWILL are:
(i) Integration of Ecodriving into learner driver education (Level 1)
(ii) Further education of licensed drivers on Ecodriving (Level 2)

More information under: [www.ecodrive.org](http://www.ecodrive.org)

10. References


To the point 3, Studies on “Drive like a pro – safe driving, both in a professional and a private context”, Editor DVR, 2009

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Drive safely and safe gas along the way – safe, economical and environmentally friendly driving; Trainer Handbook, Editor DVR, 2001