Evaluation and Monitoring for the EU Directive on Energy End-Use Efficiency and Energy Services

Case Application: Eco-drive

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Introduction

- Based on the Dutch National eco-driving programme (“Het Nieuwe Rijden”) that started in 2000
- Result from the evaluation 2007 included
- Major contributions by Michiel Beeldman (PwC), Robert van den Brink (Goudappel Coffeng) and Peter Wilbers (SenterNovem)

Step 1.1 Formula unitary gross annual energy savings

- Unitary gross annual energy savings = number of participants x Effectiveness (E) x Efficiency rate (ER) x average annual energy use per participant

- Effectiveness (E) = % of drivers that changes its behaviour due to the activity or activities conducted for a specific measure
- Efficiency rate (ER) = effect of the change of behaviour on energy savings in %

Step 1.1 Unit in unitary gross annual energy savings

- The unit used in the formula is a **specific measure** that is part of the eco-driving programme.
- So the energy savings are calculated for each type of measure.

Eco-driving measures

- Specific driver training
- Integration eco-driving in driver license training
- Simulator/virtual trainers
- Stimulating fuel saving in-car devices
- Level 3
  - Communication campaigns
  - Supporting consultation with stakeholders
  - Agreements with partner organisations

Step 1.2 Baseline items

- Baseline is the average annual energy use
- 0-measurement ahead of the programme implementation
- Regular basis (yearly of bi-annual) estimation of the average annual energy use

Step 1.3 Normalisation factors

- No normalisation factors

Step 1.4 Selection Calculation Methods, Level 1

- Focus on a acquiring the following data:
  - Average annual energy use per participant (GJ/year)
  - The number of driver trainings that has been given
  - The number of drivers having passed a driver license training with integrated eco-driving training
  - Number of participants in simulators/virtual trainings
  - The number of fuel saving devices in cars per type of device
- Default values effectiveness and efficiency

Step 1.4 Selection Calculation Methods, Level 1 (continue)

- Default values effectiveness and efficiency: each 75% of the Dutch value; so together conservativeness of 50%

	Effectiveness (E)	Efficiency Rate (ER)
1. Specific training	26 %	7.5 %
2. Driver licenses	26 %	7.5 %
3. Virtual trainer/simulator	10 %	7.5 %
4. In-car devices	67.5%	3.8 %

Step 1.4 Selection Calculation Methods, Level 2 and 3

Level 2

- National values effectiveness and efficiency

Level 3 Additional

- Comprehensive monitoring of all eco-driving measures and activities, including communication actions and agreements
- Questionnaires also to get more insight in the autonomous and policy dependent developments

Step 1.4 Selection Calculation Methods, summary of country specific data

level 1	Average energy use per driver Number of participants per measure
level 2	Average energy use per driver Number of participants per measure Effectiveness and efficiency per measure
level 3	Average energy use per driver Number of participants per measure Effectiveness and efficiency per measure Questionnaire on reported behaviour to incorporate effect of supporting measures

Step 3 Total ESD annual energy savings

Step 3.2. Requirements for double counting

The respective measures all relate to the average fuel use per driver and the changes in driving behaviour to reduce the fuel use.

When eco-driving matures, this may become significant.

This should be covered by regular updates of the effectiveness and efficiency factors

Step 3 Total ESD annual energy savings

Requirements for the free-rider effect

Together with uncertainties the free rider effects are expected to be covered by the conservative factor

For level 3 free rider effects can be taken into account, based on the results from the annual surveys

Rebound effect

Rebound effects are considered to be low in all type of measures and no data are available to estimate these low effects

Step 4 Total ESD energy savings

- A default value for diminishing the energy savings lifetime is 10% yearly

- A default assumption is that after 10 year the energy saving will continue on the level of 35%

Conclusions

- Reporting is possible based on national information on
  - average energy use per driver
  - number of participants per measure
  - Default values (combined conservatism 50%)
- Annual decrease of 10% of impact; 35% in place after 10 years
- More information to be used for level 1 and level 2 is forthcoming from the EU Ecodroven project