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Methods for the calculation of energy savings in the transport sector

Executive Summary 8.7

Obligation Schemes and Monitoring

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1 Summary

Although final energy consumed in the transport sector can be excluded from the calculation of the energy savings target according to Article 7 of the Energy Efficiency Directive (EED), energy savings from transport measures can be reported for Article 7 compliance.

Member States' Article 7 notifications and National Energy Efficiency Action Plans (NEEAPs) show that a majority of MS will report measures in the transport sector for the achievement of their energy savings target defined in Article 7 of the EED.

The transport sector is generally associated with high potential for energy savings but evaluations of programmes and measures prove to be challenging. This is due to the following reasons, among others:

- The systems analysed are usually complex; this increases the costs for evaluation.
- System boundaries are not always clear; this increases the risk of double counting.
- Established standardised evaluation procedures and standards are not available. These procedures are more often available for buildings or industrial processes.

Although the EED provides a set of requirements on how to calculate the savings from measures targeted at implementing Article 7, Member States (MS) have significant flexibility in selecting the exact calculation methodology they will use as long as requirements stipulated in Annex V have been taken into account.

Calculation methods in the transport sector are not widely applied and there are no common or similar approaches. MS activities seem to be rather based on a case by case approach. In addition, MS see specific risks in the calculation of energy savings in the transport sector.

From an analysis of transport measures reported for the implementation of Article 7, the following conclusions can be made:

- **Energy efficient vehicles** (private and public transport): the highest number of measures and methodologies is reported for this category. Methodologies to calculate energy savings in this category of measures are quite straightforward and similar among MS.
- **Increasing the share of public transport**: there are some examples of existing and planned methodologies. Examples for calculation methodologies for this category of measures could be of major interest for many MS.
- **Increasing the share of non-motorised transport and public sharing systems**: with one exception, no calculation methodologies are used in MS for these measures.
- **Behavioral measures**: the measures used for Article 7 implementation in MS range from energy taxes and eco-driving schemes to transport management. Calculations of energy savings are based on experiences and evaluations of existing schemes.

2 Recommendations/Conclusions

MS' examples of calculation methodologies in the transport sector

Three Member State examples are detailed in the following section. Here, their approaches to the calculation of energy savings in the transport sector for Article 7 are outlined.

The most important insights from these presentations are:

- The transport sector exhibits more influence factors than other sectors and is more complex to tackle;
- One way of tackling this complexity is to require measurements of savings in order to be eligible for Article 7;
- Many MS develop standardised calculation methods; the result is often not a pure deemed savings approach but a mix of bottom-up and top-down calculation combined with modelling;
- The limits to completely standardised calculation methods are illustrated by the fact that the baseline for measures in the transport often has to be determined on a case by case basis.

More information on the presentations can be found in the "Practical Examples" section below.

Calculation of energy savings for measures in public transport

A number of challenges and possible solutions were identified for the calculation of energy savings from infrastructural measures in public transport such as new lines, the extension of lines and more frequent services on existing lines. These are discussed below.

Calculation of energy savings for infrastructure measures in public transport
Challenges
Data collection and availability is a challenge for transport measures. In addition, the amount of data is potentially large and reliability is often questionable. Missing or inaccurate data leads to the need for a lot of assumptions. Concerning the **calculation of energy savings,** elements such as the definition of a baseline and the rebound effect are difficult to determine. In many cases, an analysis will have to be done on a case by case basis. In comparison to measures in the building sector, for example, measures in the transport sector are exposed to changing framework conditions and standard and well established methodologies are not available. Finally, session participants raised some issues in relation to **eligibility for Article 7**, mainly that it might be difficult to prove materiality of new lines as such measures are often part of a business-as-usual development.
Influence factors
Important influence factors for the calculation of energy savings for infrastructure measures in public transport include • The capacity and usage of existing transport modes; • The state of existing public transport infrastructure; • Frequency of services of existing transport; • The influence of new residential and commercial areas that trigger a business-as-usual development of public transport.
What baseline and lifetime?
The **baseline** in many cases will be specific to the individual project and will have to be determined on a case by case basis. A good source for baselines could be studies that were concluded before the implementation of such high investment projects. The lifetime of such measures will generally be very long (around 40 years at minimum). A source for the determination of lifetimes could be the contracts of public authorities with public transportation companies.

3 Practical Examples

This section provides three Member State examples of applied methodologies for the calculation of energy savings in the transport sector under the framework of Article7.

3.1 Ireland

In Ireland, all savings from transport measures are based on measured fuel savings. This reliance on measured savings is due to two key factors. Firstly, transport operates in the outdoor environment and is subject to uncontrollable external influences such as weather (wind, rain) and traffic congestion. Secondly, it is often impossible to separate out energy saving measures.

For major projects, an evaluation in line with IPMVP (International Performance Measurement and Verification Protocol®) is required. Smaller projects have less detailed measurement and verification requirements. In the Irish obligation scheme, there are 9 obligated parties and the oil industry is represented by one body. Most savings in the transport sector so far stem from increased focus on fuel management and eco-driving.

More detail is available in the presentation on the CA EED website www.ca-eed.eu/themes/obligation-schemes-and-monitoring-ct8 (>Presentation >Transport energy savings - Ireland).

3.2 Austria

In Austria, the overall savings target is divided between alternative measures and the energy efficiency obligation scheme. The calculation of energy savings is regulated in a decree issued according to the Federal Energy Efficiency Act. This decree also regulates what criteria evaluators of energy savings have to meet. In general, energy savings can be calculated with standardised calculation methods or individually. There are a number of standardised calculation methods for transport measures available.

There are plans to develop a method for the calculation of energy savings for infrastructure measures in public transport such as new train, tram and bus lines, the extension of existing train, tram and bus lines, more frequent services on existing lines and incentives via ticket prices. The development of such methods has shown that:

- The evaluation of complex systems needs modelling in order deliver accurate results;
- These methods exhibit potentially high development costs;
- In Austria, the initiative for the method came from public transport companies.

More detail is available in the presentation on the CA EED website www.ca-eed.eu/themes/obligation-schemes-and-monitoring-ct8 (>Presentation >Transport measures for Article 7 - Austria).

3.3 Greece

Greece plans to introduce an energy efficiency obligation scheme in which transport will also be included. For Article 7, Greece currently foresees five measures in the transport sector:

- Replacement of old public and private light trucks;
- Replacement of old private passenger vehicles;
- Promotion of CNG and LPG-powered private passenger vehicles;
- Thessaloniki metro development;
- Extension of Athens Metro.

The calculation methodology for the Thessaloniki metro development is based on a study by the company Athens Metro S.A. The methodology for the calculation of energy savings for this measure is based on data on passenger traffic, replaced vehicle-kilometres and the specific energy consumption of private passenger vehicles.

More detail is available in the presentation on the CA EED website www.ca-eed.eu/themes/obligation-schemes-and-monitoring-ct8 (>Presentation >Transport measures for Art. 7 implementation - Greece).

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For further information please visit **www.ca-eed.eu** or contact the CA EED Coordinator Lucinda Maclagan at **lucinda.maclagan@rvo.nl**

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