

# TEMPLATE

## Output factsheet: Trainings

Version 1

<b>Project index number and acronym</b>	Interreg CE Transport and Logistics Stakeholders Network (TalkNET), CE 1044
<b>Lead partner</b>	North Adriatic Sea Port Authority
<b>Output number and title</b>	O.T3.12 Testing of training pathways for energy efficiency deployment in the rail sector
<b>Responsible partner (PP name and number)</b>	Rail Cargo Hungaria Zrt (PP7)
<b>Project website</b>	<a href="https://www.interreg-central.eu/Content.Node/TalkNET.html">https://www.interreg-central.eu/Content.Node/TalkNET.html</a>
<b>Delivery date</b>	25 <sup>th</sup> May 2020

### Summary description of the implemented training measure(s), explaining the specific goal(s) and target groups

Railway freight transport has a strong increasing tendency in Europe, which also implies the increase of energy needs in the near future. This means that energy efficiency of railway transport soon becomes an emerging issue both for environmental and economic reasons.

The energy efficient train transportation is a priority task for the railway undertakings because the fee of consumed electrical energy increases the cost of transportation. Companies are eager to rationalize their costs, to increase competitiveness. Its important part is the question of energy saving achieved during train transportation, which depends directly on the handling of the locomotive, namely the proper driving of the train.

The importance of locomotive driving in an energy-efficient way is proven by practical experiences: two identical trains running on the same route could have a 40-50% difference in energy consumption, and half of the difference could be caused by non-appropriate driving style.

The Hungarian loco driver education system does not include energy-efficiency studies. Although the drivers learn the gradient ratios of the different railway lines, the rules of acceleration, braking and coasting, but not the utilization of this knowledge.

In the frame of the TalkNET project Rail Cargo Hungaria (PP7) and Lokomotion (PP13) have developed a methodology for eco-driving training of engine drivers and based on this, a 2-day training for 20 Hungarian engine drivers.

### NUTS region(s) where training(s) have been conducted (relevant NUTS level)

HU1 Közép-Magyarország  
HU2 Dunántúl  
HU3 Alföld és Észak

### Expected impact and benefits of the trainings for the concerned territories and target groups

The successful ecodriving program results in energy conscious driving behavior which can become a general habit at the company. This also means that by time the majority of the personnel will feel it a natural behavior and thus propagate this among drivers.

The railway company will benefit from efficient train driving education due as significant cost reduction can be achieved thanks to the proper driving behavior.

The energy conscious behavior of train drivers and the so achieved environment friendliness will clearly distinguish the railway company in this market. Hence, the marketing effect is also significant.

The experiences considering energy efficient driving, also opens the way to find other energy efficient measures in the everyday operation. E.g. proper scheduling of trains or adequate selection of locomotives might contribute to the total cost reduction.

An appropriate evaluation and motivation system can be applied to encourage train drivers for energy efficient driving.

The training program also prepares the future technologies for ecodriving (e.g. train driver advisory system). The drivers with energy conscious behavior will easily adapt to the new automatic system in the future.

### Sustainability of the training(s) and developed training material(s) and their transferability to other territories and stakeholders

Improving the results and reducing the costs is a key to survive and to ensure profitability for each rail freight company and for all other service providers as well. One way to reduce costs is to increase energy efficiency, to reduce the energy volume in traction. This issue has already been recognized by many railway companies and they have taken measures, developed action plans to achieve this goal. Where it is not the case, there is no need to convince management in the long run either of the importance of eco-driving. Mostly not the intention, but financial resources are missing to implement the program. This is basically a common feature of Central, Eastern and Southern European railway companies.

The methodology developed in the TalkNET project for the training on energy-efficient locomotive driving, as well as the implemented training can serve as a model not only for all Hungarian, but also for all European railway companies, being involved either in passenger or freight transport. Although the technical design of locomotives can vary considerably, in contrast to new, modern locomotives, the old ones still do not have any consumption meters, they are not suitable for

recuperation of the energy generated during braking process. Vehicle dynamics characteristics affect all types in the same way.

Energy-efficient locomotive driving can be learned and mastered. Although putting it into practice might significantly be affected by other circumstances (traffic safety, punctuality, etc.), its role remains still significant.

### Lessons learned from the development and implementation of training measures and added value of transnational cooperation

As the cost of energy required for traction has increased, and the pressure from environmental protection increased on the transportation sector, railway companies started different projects to improve energy efficiency. These projects contain of course different steps, but during traction the most important initiatives are connected to driving methods and their educational background.

As an overview of the international practice the eco-driving activity of Deutsche Bahn was examined. DB is the largest energy consumer of Germany and very interested in energy saving. In 2002 there was a comprehensive energy efficiency management program launched. During the program, all engine drivers (about 14,000 people) received both theoretical and also practical training, all 3500 locomotive units were equipped with an energy consumption meter, established a database for the documentation of the energy consumption of locomotives, and trained 300 team leaders for data processing.

Engine drivers were trained in three stages. The first was a theoretical seminar where participants learned the importance of energy efficient driving and the effects of driving on energy consumption from written materials and lectures. Learning was followed by simulation, 6 weeks after the theoretical education. Thereafter the lessons learned were tested in practice by qualified trainers on the railway line.

Between 2002 and 2005, € 32 million was saved as a result of the measures introduced. In 2006, in comparison with 2002 concerning distance passenger transport a 5% reduction in energy consumption was achieved. It means 102,000 MWh of electricity and 63,343 tons CO<sub>2</sub> emissions.

### References to relevant deliverables and web-links If applicable, pictures or images to be provided as annex

This output has a direct link to previous deliverables and outputs such as:

- D.T2.2.7 Analysis on ECO-solutions deployment - BUDAPEST
- D.T2.2.11 Gap analysis on training needs.
- D.T2.4.3 Training pathways ECO-Innovation: training curriculum energy efficiency. It was prepared on the basis of the 2 above mentioned analysis
- D.T3.1.1 Meetings to involve key players of freight transport

- D.T3.1.2 Summary report on stakeholders and target groups involved. As part of this deliverable the training was verified with the stakeholders.
- O.T3.12 Testing of training pathways for energy efficiency deployment in the rail sector