

ECORails

Energy Efficiency and Environmental Criteria in the Awarding of
Regional Rail Transport Vehicles and Services

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Energy efficiency and environmental
criteria in awarding procedures



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1. Introduction

Public Transport Administrations (PTAs) play a key role today when it comes to improving the quality and environmental performance of passenger rail transport.

The railways are one of the most environment-friendly means of passenger transport. Modal shift towards rail transport can be an appropriate measure for reducing energy consumption, CO₂ emissions, pollutants and noise. The inherent advantages of rail transport are most prominent in terms of energy efficiency. However, the railways have not yet fully exploited their potential for increasing energy efficiency and reducing environmental impact.

Many PTAs already have experience in specifying service requirements, quality criteria and other forms of obligations in PSCs, calls for tender and tender specifications for regional rail services and rolling stock. However, criteria relating to energy efficiency and environmental effects (short: “EE/ENV criteria”) have their own challenges and their application will improve the environmental impact and the efficiency of the contracted services.

A PTA that wants to award energy efficient railway services or to procure energy efficient railway tractive units (locomotives or multiple units) may use different kinds of criteria.

EE/ENV specifications should be embedded within a more general strategy for environmentally-aware awarding. Elements of such a strategy are presented in **chapter 2**, including the main political and economic arguments for having them integrated into the PTAs’ awarding policy. This issue does not only affect the relationship between the PTA and the TOC, it also impacts on infrastructure managers and the manufacturers of rolling stock. It is not likely that major technological improvements will be achieved by simply adding some ambitious specifications to the tender documents. Therefore, complementary instruments to trigger the innovation process are provided as well.

Chapter 3 deals with the legal framework. EU immission law forces local governments under certain circumstances to take action on emissions from the railways. EU environmental law already regulates the authorisation of rolling stock in terms of noise and pollutant emissions. However, if a PTA intends to go further than required by authorisation procedures, it should understand and apply the methodology of the regulations for emissions. The European competition law is not an obstacle to including EE/ENV criteria as long as a few basic principles are respected.

Part I - Guideline for the political and strategic level

2. Political considerations

2.1 Transport and environment policy integration on European and national level

The EU needs to continuously reduce CO₂ emissions substantially until 2050. In the White Paper “Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system” of 2011, the EU Commission sets the requirement of reducing the greenhouse gas emissions (including CO₂) of the transport sector by 60 % by 2050 compared to 1990. However, since the greenhouse gas emissions (GHG) continued to increase between 1990 and 2008, the target for 2050 would mean a reduction of 70 % compared to 2008. The Commission sets an intermediate goal of reducing the GHG of the transport sector by 20 % (compared to 2008) by 2030. The Commission states in the White Paper: “In practice, transport has to use less and cleaner energy, better exploit a modern infrastructure and reduce its negative impact on the environment...”¹

Reducing CO₂ emissions is a challenge that cannot be met by only using legal requirements and regulation of emission levels. Instead, the initiative, including investments, of public bodies is necessary in order to re-direct the development of private investments and technology. In the case of passenger transport, the railways emit less CO₂ than, for example, private cars by a factor of between 2 and 4, depending on the concrete technology, the occupancy rate, and the energy mix in the catenary. Therefore, modal shift towards the railways is an important means of climate policy. But the railways themselves can also become more efficient in terms of energy consumption and CO₂ emissions. Reducing the CO₂ emissions of the railways directly contributes to climate protection. Although sometimes additional investments could be necessary, the railways can achieve substantial improvements by just changing modes of operations without considerable costs.

The exhaust emissions of diesel operations and the noise emissions of railway operations in general can become obstacles for improving railway services. Noise in particular encourages people living near existing or planned railway lines to oppose more intense traffic. It is not only increasing energy prices that pose a risk to public finances (and the budgets of PTAs) but also the noise abatement measures that need to be taken alongside railway tracks.

Public Transport Administrations (PTAs) play a strategic role in terms of both achieving modal shift towards the railways and the improvement of energy efficiency and environmental impact of the railways themselves.

¹ EU Commission, WHITE PAPER «Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system», COM(2011) 144 final, pp. 3 (par. 6), 6 (par. 17), http://ec.europa.eu/transport/strategies/2011_white_paper_en.htm.

2.2 Why integrate energy efficiency and environmental aspects into awarding procedures?

There are several reasons why energy efficiency and other environmental criteria are an important issue for PTAs.

(1) Risk for public finances

Regional passenger rail transport in all European countries is financed to a great degree by public budgets. Providing public transport services is an important duty of governments and administrations because such services are a prerequisite for keeping modern societies functioning. The following risks can be reduced or avoided by forcing the TOCs to procure more efficient, more silent and less polluting rolling stock, or to apply improved methods of operation:

- Rising prices for energy and CO₂ emission rights: Even if at first the TOCs pay for the energy consumption, depending on the contract and the institutional framework, at the end of the day the increased energy bill for train services will to a great extent be paid by public budgets.
- The Environmental Noise Directive (2002/49/EC) forces governments to develop and execute plans for the abatement of noise and may even encourage people living in the vicinity of roads and railways to take legal action for protective measures.
- Similarly, the Air Quality Directive (2008/50/EC) forces the governments to take measures to avoid exhaust emissions, which may affect diesel train operations. Citizens in polluted areas may demand protective measures.

(2) Insufficient price signals

(See separate issue!)

(3) Protection of the population

People living or working in agglomerations or in the neighbourhood of busy railway lines suffer from pollutant and noise immissions. The protection of the population is a responsibility on PTAs as part of the government's overall administrative duties. This is a reason why PTAs should influence the pollutant and noise-related quality of rail passenger services. The respective EU regulations (TSI Noise and "Non-road directive"; see *chapters 3.1, 5.5 and 5.6*) are almost only valid for the authorisation of new vehicles and may therefore not suffice in meeting the requirements of air and noise protection. It is questionable to what extent stricter authorisation requirements will be technically or economically feasible, but there is room for decisions like modernisation of existing vehicles, allocation of "better" vehicles to lines with the most serious environmental burdens, and an integrated approach for vehicles, operations, superstructure and infrastructure.

(4) Renewable energies

With respect to climate protection the reduction of CO₂ emissions should be a prominent objective of PTAs when awarding passenger train services. The electric traction can allow the use of energy from renewable sources such as water, wind and solar. Using electricity from renewable sources would be an important signal in favour of the positive role that the railways can play in climate protection.

PTAs (and TOCs) can push forward the use of renewable sources when they are able to achieve contracts for the traction energy supply with a high share (up to 100 %) of “green power”. The bargaining power depends on how supplies of energy for the railways is organised, the national energy market and the availability of “green energy” in the respective country. Such contracts already exist, e.g. in Denmark and parts of Germany, and might be achieved in other countries as well. Within regional networks it might be easier to achieve direct contracts between TOCs or PTAs and a provider of eco-electricity.

(5) Innovation and backing for the railways

By using EE/ENV criteria, the PTAs can trigger the railways’ innovation process. This would be very helpful backing for the railways with regard to their reputation, modernisation and prominent role in transportation policy. The PTAs may help to overcome market barriers for new technologies and positively influence the future innovation process in terms of energy efficiency and environmental effects.

(6) Ease of infrastructure development

In some areas new or improved railway infrastructure is not welcomed by the residents because of the expected noise immission levels. If more silent vehicles are used, such problems can be defused. Costly investments for noise protection can be reduced or completely avoided. Thus more silent passenger trains facilitate the way towards modal shift.

The relevance of the aspects given above may differ from region to region. But these outcomes clearly show that the application of environmental and energy efficiency criteria will reduce political, social and financial risks. In some cases solutions are available that do not only address environmental problems, but lead to economic benefits as well (*see chapter 5.4*). The ECORailS consortium, which includes a number of PTAs, is convinced that financial, and also technological and legal obstacles can be overcome by clearly analysing the technical potential, carefully defining the requirements and incentives and embedding all tenders in a more long-term oriented and coordinated environmental strategy. The analysis of the state of the art shows that solutions are available for the railways that will allow the reduction of energy consumption and of negative environmental impacts with affordable efforts.²

² Further information is also given in the Deliverables 6, 7 and 8 of the ECORailS project (see www.ecorails.eu).

There are already some examples of good-practice in terms of making regional passenger transport in Europe more energy-efficient and environment-friendly. Such efforts affect e.g. noise emission limits for vehicles that were prescribed by the PTA, enhanced standards for emissions from diesel operation, the use of renewable energy or calculations of the life-cycle energy consumption of rolling stock.³

3.2 Integration of EE/ENV aspects into public procurement of services and vehicles

European legislation allows (and explicitly encourages) ambitious ecological standards to be set and enforced by awarding procedures as long as the following four main principles are observed:

- non-discrimination
- proportionality
- transparency
- equal treatment

The European Court of Justice (ECJ) has already emphasized the permissibility of environmental assessment criteria in awarding, as long as they are non-discriminatory and they are associated with the subject of the contract.⁴

Awarding authorities are free to decide *what* to award and which quality criteria (including EE/ENV criteria) to apply. Regulation (EC) **No. 1370/2007 of 23 September 2007**, OJ L 315/1⁵, allows explicitly the inclusion of quality standards (thus including environmental criteria) into the contract (art. 4 par. 6):

"Where competent authorities, in accordance with national law, require public service operators to comply with certain quality standards, these standards shall be included in the tender documents and in the public service contracts."

PTAs must however respect certain rules on *how* to award, which are defined in European legislation (in particular: Regulation 1370/2007, also: fundamental freedoms of the European Treaty⁶). The EU regulation provides great flexibility (although not unlimited) for awarding railway services, with respect to the type of awarding procedure, the selection of the TOC, and the definition of criteria. National legislation on awarding and tendering may however limit the PTA's flexibility. EU law allows and defines the respective limitations for the following types of awarding procedures:

- competitive tenders
- in-house provision
- direct awarding⁷

³ Some examples are given in the Deliverables 9, 10 and 11 of the ECORails project (see www.ecorails.eu).

⁴ See European Court of Justice, Case C-513/99 of 17 September 2002 – Concordia Bus Finland (published in OJ C 274, 09.11.2002, p. 4)

⁵ Regulation of the European Parliament and of the Council on public passenger transport services by rail and by road" (Regulation (EC) No. 1370/2007); in force since Dec. 2009.

⁶ Treaty of Lisbon, in force since 1 Dec. 2009

⁷ The option direct awarding is an exception for railway services (see Regulation (EC) No. 1370/2007 art. 5 par. 6).

Any criteria, requirements, weighting/scoring and incentive schemes which are used for the evaluation of tenders or during the contract period, must be defined in awarding documents as well as in public service contracts. This includes the method for calculation of compensation or penalty levels and how to monitor the compliance to the criteria.

When the PTA is intending to procure vehicles, the stricter EU Directive coordinating the procurement procedures of entities operating in the water, energy, transport and postal services sectors (**2004/17/EC of 31 March 2004**, OJ L 134/1) and the Directive on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts (**2004/18/EC of 31 March 2004**, OJ L 134/114) must be respected. The latter regulations must also be considered in cases of awarding services where environmental criteria for rolling stock (to be provided by the TOC) are explicitly defined.

The EU regulations cited above basically allow freedom of manoeuvre to specify the subject of the award, e.g. considering energy efficiency or pollution. However, the requirements have to be non-discriminatory. For example, the specification of a particular pollution filter (in the sense of a specific producer) would not be allowed. On the other hand, the specification of a maximum level of pollution or a cleaning method would be permitted, even if these limits were stricter than required by European or national regulations on emission limits. Specific environmental evaluation criteria for the appraisal of the offers are possible, but

- should be associated with the subject of the contract;
- should not admit unlimited scope of action for the public authority;
- have to be mentioned explicitly in the contract notice (announcement of the tender) and the tender documents;
- have to be consistent with the basic principles of EU-legislation.

For the authorisation of new or refurbished railway vehicles the respective national and EU regulations need to be respected, especially those related to safety and interoperability. Key responsible bodies for these issues are the national rail safety agencies or governmental directorates. Such regulations are not corresponding in terms of environmental issues, but in some cases the technologies which are described in chapter 5.4 may have implications for authorisation procedures.

Part II – Guideline for the operational level

4. Contracting and awarding with EE/ENV issues

4.2 Instruments for including EE/ENV criteria

Energy efficiency and other environmental criteria can be included in all main types of awarding procedures: competitive tendering or direct awarding. In the technical sense there are mainly four ways of using criteria:

- (1) Requirements
- (2) Weighting and scoring
- (3) Penalties if a defined quality is not realised during the contract duration
- (4) Incentives (bonus/malus) for good performance or improvements during the contract duration

Requirements

Requirements are criteria that the TOC or manufacturer needs to fulfill as minimum standards in order to be qualified for the contract. The fulfillment must be verified and monitored. Bidders who breach the minimum standards will face sanctions which need to be defined in the service contract in advance.

In case of long contract durations, requirements that apply at a specified time later in the contract period, may also be defined.

The requirement of ecological standards which exceed the current regulations can be accepted by the bidders if the tender documents give a clear and calculable picture of the assessment criteria and reflect the availability, reliability and costs of the respective technologies.

Weighting and scoring

There are two main types of criteria to be considered for a weighting or scoring scheme:

- (1) Features which are either offered or not.
- (2) Improved performance values; in this case, the better the performance values offered, the higher the scores received by the bidder. The evaluation could be done with mathematical functions or the definition of quality classes which represent certain ranges of values.

The intention of such a weighting scheme is (a) to encourage good solutions while not increasing the price too much, and (b) to find an algorithm for comparing (in a legally secure way) different quality and EE/ENV features. Many European PTAs already use such weighting schemes regularly. The schemes are often designed to specific needs and situations of the PTAs.

The relative weight of criteria depends on the PTA's priorities, availability on the market, and inherent incentives for the bidder. Technical details should be requested from the bidder in order to allow the "anomalous offer check" before the tender is awarded. The standards which the PTA and the successful bidder have agreed upon must be monitored, and the bidder will face sanctions if the offered standards are not met.

Incentives and/or penalties

The usual incentive/penalty schemes (e.g. for punctuality or reliability of services) can also be applied with regard to EE/ENV specifications. The schemes usually refer to an agreed level of performance. Incentives for good performance or improvements during the contract period can be used if the TOC has different options to improve e.g. the energetic performance. An incentive scheme may also encourage investments by the TOC during the contract period such as procurement of new vehicles or refurbishment of the existing fleet.

The conditions for the incentive scheme need to be announced or agreed upon in advance. Penalties and bonus/malus levels need to be proportionate.

The four ways of using EE/ENV criteria mentioned above should be considered for each single criterion. A combination of these tools is also possible (e.g. requirements for minimum standard and weighting for additional measures).

It is recommended to assess which standards and technologies are available at the time of starting the awarding project. In general a combination of binding requirements and incentives should be applied. The criteria and targets to be included need to be simple to verify, monitor and report. There should be room for the bidders' own suggestions on how to achieve better environmental performance. However, these suggestions have to be transparent and comprehensible for the PTA.

Where specific technology is concerned, the recommended approach is to specify the technology functionally (e.g. efficiency of energy storage or necessary functions of parked train control systems) and not proprietary solutions or products. The latter could even cause major legal problems while the functional approach is viable in almost all cases.

During the compilation of the tender or contract documents, each criterion should be checked in terms of practicability, appropriateness, legal security, and economical risks. However, a comprehensive survey should be done before finalisation in order to avoid unwanted consequences due to interactions between the criteria or their accumulation. A respective checklist is given in Annex T-2. It should also be reviewed if the final compilation of criteria is in line with the strategic considerations of the PTA (*see chapter 2.3*).

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This document has been elaborated basing on in-depth analysis of the legal, economical and technological situation. However, national and European law (as well as its interpretation by courts), and other relevant determinants may change. Furthermore, not every possible combination of criteria has been analysed. Therefore neither Allianz pro Schiene nor any other partner of the ECORails consortium accept any liability for problems which may occur by using this version in real awarding projects or other circumstances.

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