EUROPEAN UNION AGENCY FOR RAILWAYS

Making the railway system work better for society.

Full Impact Assessment

Revision of the Commission Regulation (EU) No 445/2011 of 10 May on a system of certification of entities in charge of maintenance for freight wagons

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Document History

Version	*Date*	*Comments*
0.1	19/09/2017	Preliminary version of the FIA report covering Sections 1, 2 and 3 (partially)
0.2	06/10/2017	Updated version of IA report covering Sections 1, 2 and 3
1.0	21/12/2017	First complete draft of IA report covering all sections; Review OG
1.1	25/04/2018	Updated version of IA report taking into account consultation comments and WP No. 3
1.2	15/05/2018	Updated version of IA report taking into account additional feedback and comments from WP No. 4
1.3	11/06/2018	Final draft of IA report for RISC June 2018 taking into account final draft recommendation

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1. Context and problem definition

1.1. Problem and problem drivers	**Main problem**: potential sub-optimal framework for managing maintenance risks, particularly in the case of other vehicles than freight wagons. Safety issues deriving from deficient maintenance are not in scope, as the main objective of ECM certification was to prompt market development whilst maintaining adequate safety levels and not to address possible safety issues. **Problem drivers**: Set A. related to the fact that current ECM regulation only covers wagons and not locomotives, passenger coaches, DMUs/EMUs, other vehicles: › Potential **inefficient, complex and resource-intensive processes for RUs** to make sure that maintenance of vehicles fulfils their responsibility for safe operation. This could particular be the case when using third party ECMs / maintenance providers as well as for technical advanced rolling stock. › Possible existence of **multiple/duplicative customer certification requests to ECMs and maintenance workshops** that could result in additional costs for such entities and difficulty for entering new market segments Set B. related to the clarity and application of the current ECM regulation (these are of relevance for scope extension unless addressed as part of the revision of the ECM regulation): › Diversity of how requirements and methods are applied due to **diverging interpretation in Member States** (potentially leading to misinterpretation) of the current provisions on ECM certification › Lack of clarity in the **definition and allocation of responsibilities among keepers, ECMs, RUs and other stakeholders** operating vehicles resulting in uncertainty among the concerned stakeholders and possibly additional costs These problem drivers were considered during several meetings of the ECM WP. Further evidence on the problem drivers are provided in **Annex EcoEv1** setting out information collected from bilateral meetings and other sources.
1.2. Main assumptions	The Safety Directive (Article 14.7) provides for that: 'By 16 June 2018, the Agency shall evaluate the system of certification of the entity in charge of maintenance for freight wagons, consider the expediency of extending that system to all vehicles and the mandatory certification of maintenance workshops and submit its report to the Commission'. The impact assessment is incorporating available information sources in order to underpin the assumptions concerning costs and benefits:

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The Agency's Ex-Post report[1] on the implementation of the Regulation 445/2011 (February 2015) presenting key results on the costs and benefits of the certification scheme for ECMs, maintenance providers and maintenance workshops regarding freight wagons.
An Agency Early Assessment Report (June 2015) providing a basis for the present impact assessment work, by indicating a first set of options (incl. mandatory and voluntary scope extension) and elaborating on the main potential benefits and costs of each of those options.

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<tr><td>1.3. Stakeholders affected</td><td>
<table>
<tr><th>Category of stakeholder</th><th>Importance of the problem</th></tr>
<tr><td>RUs</td><td>5</td></tr>
<tr><td>IMs</td><td>3</td></tr>
<tr><td>ECMs</td><td>5</td></tr>
<tr><td>Maintenance workshops</td><td>5</td></tr>
<tr><td>Keepers</td><td>4</td></tr>
<tr><td>Manufacturers</td><td>3</td></tr>
<tr><td>RST leasing companies</td><td>4</td></tr>
<tr><td>Certification bodies (CB)</td><td>4</td></tr>
<tr><td>NSAs</td><td>4</td></tr>
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Some stakeholders do not consider the extension of the scope as an urgent need. It is also suggested by some of those stakeholders that, when the management of maintenance is clearly defined and controlled, there may be no evidence that an actual problem needing solution exists. As such these views has been considered thoroughly in the impact assessment. In particular, this has been addressed through bilateral information exchanges with a broad range of stakeholders.
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<tr><td>1.4. Evidence and magnitude of the problem</td><td>
(I) Agency's Ex-Post report on the implementation of the Regulation 445/2011 (February 2015) highlighted the following:

Since 2012 the sector and a number of NSAs demonstrated interest for the extension of scope to all vehicles

in 2015 a certification service to ECMs for locomotives and passenger coaches was proposed at least by one company, which was already active in the certification of ECMs for freight wagons
one NSA also started a process for defining a national ECM certification scheme for locomotives and passenger coaches. Other countries are expected to follow, thereby potentially

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[1] The ECM Implementation Report can be accessed from this link:
https://extranet.era.europa.eu/safety/REVECM/Specific-reference-documents/implementation%20445-2011.zip

	resulting in increased diversity of management and delivery of maintenance for railway vehicles. › A guideline for development of a voluntary certification scheme had been proposed by the Agency in 2014 to the Freight Focus Group. However, the Freight Focus Group clearly indicated that the guideline (as a non-legally binding instrument) was not enough but it could be the basis for the extension of scope of the Regulation. › The results of a comprehensive questionnaire (with 200+ respondents) launched by the Agency in 2014 reinforced the perception that the sector and several NSAs are strongly in favour of the extension of scope, for reasons such as: › need for a comprehensive (harmonised) certification scheme for all vehicles thereby resulting in reduced administrative burden › a number of ECMs do not currently provide a service for freight wagons only › advantage of a clear standardisation of rules for maintenance for all vehicles. › It is expected that the **cost of certification** for other vehicles would be of the same order of magnitude as the cost for initial certification of ECMs maintaining freight wagons (up to 40.000 - 50.000€ on average, although subject to variation between Member States). Currently, a voluntary ECM certification system for other vehicles is implemented in one MS. The costs of this system are similar to those of certification of freight wagons and have decreased by up to 15%, compared to the costs of implementing previous national regulations. › Extension of scope may be beneficial for **RUs wishing to concentrate their resources in transport activities** because it would release them from the duty of putting in place internal maintenance services or assess and choose external maintenance services. › However, the **specific business models for passenger transport** should be considered, as they are different from those related to freight transport for which the current Regulation applies to freight wagons. As such, this refers also to differences in terms of extent of exchanges of vehicles between stakeholders. These differences may necessitate adjustments to the provisions in the Regulation. **(II) Agency Early Assessment Report on extension of ECM certification (June 2015)** highlighted the following: › There is strong sector support for the scope extension, although RST leasing companies and small maintenance providers are less in favour. › The order of magnitude of the problem depends on the **specific context of each stakeholder**: › For RUs currently carrying out the maintenance of their vehicles in-house, the issue of the sub-optimal control of maintenance risks is relatively limited depending on the complexity of the concerned rolling stock.

	› The growing complexity of technical systems and the decrease in public budgets for incumbent RUs may lead to them totally or partially subcontracting the maintenance of their fleet. › Differently, for RUs already having outsourced maintenance activities this problem could be more substantial. › For ECMs, maintenance providers and maintenance workshops, the extent of the issue resulting from the need to retain several maintenance management systems (to fulfil different customer requirements) will be determined by whether their business focus is on a single customer and in one type of vehicle types or not, i.e. on multiple customers involving different types of vehicles. › The ECMs providing maintenance services for freight wagons only are not affected. › Considering the expected increase of outsourcing of maintenance of locomotives and coaches, together with the need for a reliable and competitive maintenance service market, the relevance of the identified issue may increase in future. Thus, a flexible solution that fits with the needs of different stakeholders is required. **(III) Inputs and reflection from ECM Regulation Working party:** › Following the 1st and 2nd WP meetings in May and in October 2017 it appears that the strong support from the sector to the extension of scope of the Regulation to all vehicles is somewhat less clear-cut. › Some key aspects need to be taken into account: › not only the technical complexity of the subsystems forming the vehicles, but also the costs deriving from certification schemes on a wider basis throughout the lifetime of vehicles. › intended use foreseen for the vehicles and possible specificities in the management of maintenance by RUs operating passenger trains › the influence that a possible scope extension may have on the competitiveness of small maintenance providers and RUs. › Moreover, the positions expressed by the WP members do not necessarily coincide on whether scope extension may involve all vehicles or not and whether it should be voluntary (mainly favoured by the sector organizations) or mandatory (mainly favoured by NSAs) although in both cases there is a range of views put forward. › There are still references to harmonisation and transparency purposes, which could help companies searching abroad for ECMs as regards the significant diversity of national rules. › Some WP members believe that further efforts are needed in the implementation of Regulation 402/2013 (CSM for risk assessment and repealing Regulation 352/2009) in the area of maintenance, whereas stronger transparency in procedures and a closer

	collaboration between the involved parties would also be of advantage. › Another concern was the extent of harmonisation of assessment criteria applied in practice by CBs. › It was noted that no dramatic increase of costs is expected in case of mandatory certification, if organisations comply with the requirements of the RSD. However, there was no consensus on this. **(IV) Considerations on the certification of maintenance workshops:** › At present the certification of maintenance workshops is voluntary according to the ECM Regulation (Regulation 445/2011). The lack of identification of a set of certifiable common operations carried out by workshops certification is seen as an issue and may result in higher costs for RUs when assessing the ability of maintenance workshops to manage maintenance activities and to deliver their operational functions. › Additional specific arrangements, including adequate monitoring and surveillance measures of workshops, could be included in a contract, if an ECM decides to conclude one.
1.5. Baseline scenario	**Baseline scenario**: continuation of the current legal framework, i.e. the application of the certification scheme of ECMs and maintenance workshops to freight wagons only. This may lead to persistent problem drivers: - from **Set A** - section 1.1: › RUs searching for external maintenance services may find the selection of an ECM corresponding to their needs challenging (this could be especially serious for new entrant RUs, for which in-house maintenance is not necessarily an option) › RUs could find it challenging to obtain assurance that the maintenance externally provided to locomotives and coaches is adequate so that risks are controlled and operations are safe › For external ECMs and maintenance workshops providing services to locomotives and/or coaches, the existence of different requests for specific customer certifications or of different monitoring and control systems at national level, including certification schemes, is potentially also a disadvantage › Lack of recognition of voluntarily certified ECMs for maintenance of other vehicles, which feel the need to re-assess and "re-certify" each other. - from **Set B** – section 1.1: › none of the issues regarding the current ECM Regulation would be addressed (e.g. the lack of clarity in the definition and allocation of responsibilities between keepers, ECMs and RUs operating wagons also not address any issues).

	As a result, the baseline would imply that management of maintenance risks could continue at a sub-optimal level, including difficulties for smaller maintenance providers when wishing to enter new markets.
1.6. Subsidiarity and proportionality	The concept of ECM itself was introduced through EU legislation (the RSD) thereby addressing the issue of **subsidiarity**. This was one of the elements considered to contribute to ensure safety is at least maintained in the process of restructuring the European railway sector, with new actors being made responsible for functions previously assigned to incumbent operators. The options considered for scope extension adopt an incremental approach in line with the **proportionality** principle. Thus EU action is justified on this matter, as it had already been the case with the Regulation regarding freight wagons.

2. Objectives

2.1. Strategic and specific objectives	**Strategic objective(s) of the Agency** with which this initiative is coherent include: ☐ Europe becoming the world leader in railway safety ☒ Promoting rail transport to enhance its market share ☒ Improving the efficiency and coherence of the railway legal framework ☐ Optimising the Agency's capabilities ☐ Transparency, monitoring and evaluation ☒ Improve economic efficiency and societal benefits in railways ☐ Fostering the Agency's reputation in the world The project's **general objective:** to contribute to optimising the management of maintenance risks in the railway sector. **Specific objectives**: 1. Increase the efficiency for RUs making sure that in their maintenance of vehicles they fulfil their responsibility for safe operation 2. Reduce presence of multiple / duplicative customer certification requests to ECMs and maintenance workshops 3. Reduce diversity of requirements and methods applied in relation to the certification of ECMs and maintenance workshops 4. Enhance clarity in the definition and allocation responsibilities among keepers, ECMs and RUs operating vehicles
2.2. Link with Railway Indicators	n.a.

3. Options

3.1. List of options

The following options are under consideration:

- **Option 0 (do-nothing)**
- **Option 1**: Revision of current Regulation and scope extension to locomotives as a voluntary certification scheme + voluntary-based certification of MWs.
- **Option 2**: Revision of current Regulation and scope extension to all vehicles (incl. locomotives and coaches) as a voluntary certification scheme + voluntary based certification of MWs
- **Option 3**: Revision of current Regulation and scope extension to locomotives as a mandatory certification scheme with voluntary certification for other vehicles + voluntary based certification of MWs.
- **Option 4**: Revision of current Regulation and scope extension to all vehicles (incl. locomotives and coaches) as a mandatory certification scheme + voluntary based certification of MW.
- **Option 5** (incremental from Option 4): Revision of current Regulation introducing mandatory certification of maintenance workshops for all vehicles.

3.2. Description of options

	Option 0	Option 1	Option 2	Option 3	Option 4	Option 5
Revision of current legal text	No	Yes	Yes	Yes	Yes	Yes
Scope extension (ECMs)	No	Locos	All vehicles	All vehicles	All vehicles	All vehicles
Regime of certification	-	Voluntary	Voluntary	Mandatory for locos Voluntary for the rest	Mandatory	Mandatory
Stakeholders certified (voluntary certification of MWs possible for all options though mandatory for Option 5)	-	ECMs	ECMs	ECMs	ECMs	ECMs and MWs

3.3. Uncertainties/risks

- Scope extension of the Regulation to other vehicles may be challenging given the differences between freight and passenger transportation regarding business models
- Impacts of scope extension are influenced by broader maintenance market trends including the extent to which RUs are outsourcing maintenance to external parties and the extent to which maintenance providers / ECMs tend to specialise in terms of the types of vehicles covered.

4. Impacts of the options

4.1. Impacts of the options (qualitative analysis)

The qualitative analysis is considering the impacts from a European perspective. This implies that the following statements take a higher level meaning that there could be national variations, as well as variations within groups of stakeholders. It should also be noted that the following analysis focuses on ECMs and MWs, RUs, keepers, RST leasing companies, ECM CBs and NSAs. Overall, it is expected that the main stakeholders affected by scope extension would be: ECMs, MWs as well as RUs and keepers.

Category of stakeholder		*Option 0 (baseline)*
ECMs and Workshops	Positive impacts	No changes
	Negative impacts	No changes
RUs	Positive impacts	No changes
	Negative impacts	No changes
Keepers	Positive impacts	No changes
	Negative impacts	No changes
RST leasing companies	Positive impacts	No changes
	Negative impacts	No changes
ECM Certification Bodies	Positive impacts	No changes
	Negative impacts	No changes
National Safety Authorities	Positive impacts	No changes
	Negative impacts	No changes
Overall assessment *(input for section 5.1)*	Positive impacts	No changes
	Negative impacts	No changes

Category of stakeholder		*Option 1 – Voluntary scope extension to locomotives*
ECMs and Workshops	Positive impacts	Only ECMs having a commercial net-advantage of certification would opt for this scheme. No significant implications for MWs
	Negative impacts	For ECMs additional certification costs, though likely to be somewhat mitigated by elimination of other customer certification requests. No significant implications for MWs

		Given the limited scope of this certification scheme the business case may be relative modest.
RUs	Positive impacts	Similar level of assurance regarding the maintenance for locomotives as for freight wagons.
	Negative impacts	Given the limited scope of the certification scheme the efficiency gains for RUs are modest compared to the baseline.
Keepers	Positive impacts	For keepers being ECMs see above under ECMs. In general, positive impacts could relate to more efficient basis to assure to RUs that vehicles (locomotives) provided meet consistently safety requirements.
	Negative impacts	For keepers being ECMs see above under ECMs.
RST leasing companies	Positive impacts	-
	Negative impacts	Voluntary scheme with scope limited to locomotives is not perceived to generate added-value for RST leasing companies in terms of reducing resources
ECM Certification Bodies	Positive impacts	Certification scheme may support market opportunities for CBs for certification of ECMs for other vehicles (locomotives)
	Negative impacts	Cost impacts to obtain accreditation / recognition may be a barrier for CBs given the limited scope of the certification scheme
National Safety Authorities	Positive impacts	In those cases where the NSA is also the ECM CB there could be limited impact in terms of resources.
	Negative impacts	
Overall assessment *(input for section 5.1)*	Positive impacts	Voluntary based certification scheme would imply that ECMs would only apply if there is a business case Harmonisation benefits for RUs, though relative modest Limited scope would reduce any adverse cost impacts
	Negative impacts	Identified problem drivers are likely not to be sufficiently addressed under this option

Category of stakeholder		*Option 2 – Scope extension all vehicles (voluntary)*
ECMs and Workshops	Positive impacts	Voluntary framework for scope extension should ensure that only ECMs having a commercial net-

			advantage of certification would opt for this scheme. The risk of duplicative certification requests for all vehicles may be reduced. The option could also bring advantages by clarifying the responsibilities between ECM / RU and Keeper for other vehicles No significant implications for MWs
		Negative impacts	For ECMs additional certification costs, though likely to be mitigated by elimination of other customer certification requests No significant implications for MWs
	RUs	Positive impacts	Similar level of assurance regarding the maintenance for other vehicles as currently for freight wagons. Clarity of responsibilities between RU / ECM / Keeper.
		Negative impacts	Given the voluntary status of the certification scheme the efficiency gains will depend on take-up of the certification system by ECMs and the extent of trust by RUs
	Keepers	Positive impacts	For keepers being ECMs see above under ECMs. More efficient basis to assure to RUs that vehicles provided meet consistently safety requirements. Advantages from clarity of responsibilities between RU / ECM / Keeper
		Negative impacts	For keepers being ECMs see above under ECMs. Compared to the current situation (baseline) limited direct changes for keepers not being ECMs.
	RST leasing companies	Positive impacts	-
		Negative impacts	Voluntary scheme is not perceived to generate added-value for RST leasing companies in terms of reducing resources
	ECM Certification Bodies	Positive impacts	Certification scheme may support market opportunities for CBs for certification of ECMs for other vehicles.
		Negative impacts	No significant issues for CBs. Any cost / resource implications would normally be covered through revenue from certification activities.
	National Safety Authorities	Positive impacts	In those cases where the NSA is also the ECM CB there could be limited impact.

		NSAs may obtain advantages by simplifying their assessment of single safety certificate applications as well as targeting supervision tasks with respect to RUs.
	Negative impacts	-
Overall assessment *(input for section 5.1)*	Positive impacts	Potential for efficiency gains for RUs and cost savings for ECMs through reduced duplicative / overlapping customer certification request. Advantages through reduced diversity re. requirements and methods applied in relation to the certification of ECMs as well as progress on clarity of responsibilities
	Negative impacts	Costs impacts notably for ECMs in relation to the certification. However, given that it is a voluntary scheme this issue should in fact have limited implications. Furthermore, it should be noted that in general the direct costs involved for scope extension are relatively low.

Category of stakeholder		*Option 3 – Scope extension all vehicles (mandatory for locomotives; voluntary for other vehicles)*
ECMs and Workshops	Positive impacts	The risk of duplicative certification requests for all vehicles will be reduced although the extent of this advantage is limited by the certification scheme being partly voluntary. Clarify to a certain extent the responsibilities between ECM / RU and Keeper for other vehicles. No significant implications for MWs
	Negative impacts	For ECMs additional certification costs, though likely to be somewhat mitigated by elimination of other customer certification requests. Differentiating between locomotives and other vehicles may limit the extent of reduction in duplicative certification. No significant implications for MWs
RUs	Positive impacts	RUs would obtain similar level of assurance regarding the maintenance for locomotives as currently for freight wagons. RUs

			will also benefit from some improvements regarding the clarity of responsibilities between RU / ECM / Keeper.
		Negative impacts	Given the voluntary status of the certification scheme with respect to other vehicles than locomotives the efficiency gains will depend on the take-up of the certification system by ECMs and the extent of trust in the system by RUs
	Keepers	Positive impacts	For keepers being ECMs see above under ECMs. Relative more efficient basis to assure to RUs that vehicles provided meet consistently safety requirements. Some advantages from clarity of responsibilities between RU / ECM / Keeper.
		Negative impacts	For keepers being ECMs see above under ECMs. Compared to the current situation (baseline) limited direct changes for keepers not being ECMs, although any adverse cost implications would need to be carefully monitored. The dual system for locomotives / wagons and other vehicles may limit the advantages.
	RST leasing companies	Positive impacts	Facilitating the management of maintenance by contractors resulting in reduced costs, as regards locomotives. In the case of other vehicles the implications need to be considered carefully given the particularities of maintenance management of RUs operating passenger trains. However, cost implications would be mitigated by the voluntary status.
		Negative impacts	Possible impacts on costs would need to be examined taking into account the life cycle costs of rolling stock particularly in the case of locomotives.
	ECM Certification Bodies	Positive impacts	Certification scheme could support market opportunities for CBs for certification of ECMs for other vehicles.
		Negative impacts	No significant issues for CBs. The positive impacts could be uncertain given the voluntary status of the certification scheme for other vehicles than locomotives.

	National Safety Authorities	Positive impacts	In those cases where the NSA is also the ECM CB there could be limited impact. Moreover, NSAs may obtain advantages by simplifying their assessment of single safety certificate applications as well as targeting supervision tasks with respect to RUs. However, these advantages would for other vehicles than locomotives and wagons depend on the extent of take-up of the certification scheme by ECMs and the trust placed in the scheme by RUs
		Negative impacts	In those cases where the NSA is also the ECM CB there could be limited impact
	Overall assessment *(input for section 5.1)*	Positive impacts	Potential for efficiency gains for RUs and cost savings for ECMs through reduced duplicative / overlapping customer certification request. Reduced diversity re. requirements and methods applied in relation to the certification of ECMs as well as progress on clarity of responsibilities.
		Negative impacts	Costs impacts notably for ECMs in relation to the certification with particular reference to locomotives. However, it should be noted that in general the direct costs involved for scope extension are relatively low. Advantages may be lowered due to the dual systems in place for locomotives / wagons and other vehicles

Category of stakeholder		*Option 4 – Scope extension all vehicles (mandatory)*
ECMs and Workshops	Positive impacts	Duplicative certification requests for all vehicles will be reduced. Clarifying the responsibilities between ECM / RU and Keeper for other vehicles. No significant implications for MWs
	Negative impacts	For ECMs additional certification costs, though likely to be mitigated by elimination of other customer certification requests. Moreover, the costs involved are relatively low. Specific issues for small ECMs would need to be taken into account. No significant implications for MWs

	RUs	Positive impacts	RUs would obtain similar level of assurance regarding the maintenance for other vehicles as currently for freight wagons. RUs will also benefit from clarity of responsibilities between RU / ECM / Keeper.
		Negative impacts	For negative impacts in case the RU is an ECM see analysis above for ECM. In other cases it is likely that negative impacts would be relatively limited.
	Keepers	Positive impacts	For keepers being ECMs see above under ECMs. A more efficient basis to assure to RUs that vehicles provided meet consistently safety requirements. Clarity of responsibilities between RU / ECM / Keeper.
		Negative impacts	For keepers being ECMs see above under ECMs. Compared to the current situation (baseline) limited direct changes for keepers not being ECMs, although any adverse cost implications would need to be carefully monitored.
	RST leasing companies	Positive impacts	Facilitating the management of maintenance by contractors resulting in reduced costs, as regards locomotives. In the case of other vehicles the implications need to be considered carefully given the particularities of maintenance management of RUs operating passenger trains.
		Negative impacts	Possible impacts on costs would need to be examined taking into account the life cycle costs of rolling stock.
	ECM Certification Bodies	Positive impacts	Certification scheme could support market opportunities for CBs for certification of ECMs for other vehicles.
		Negative impacts	No significant issues for CBs. Any cost / resource implications would normally be covered through revenue from certification activities.
	National Safety Authorities	Positive impacts	In those cases where the NSA is also the ECM CB there would be limited impact. Moreover, NSAs could obtain advantages by simplifying their assessment of single safety certificate applications

		as well as targeting supervision tasks with respect to RUs.
	Negative impacts	In those cases where the NSA is also the ECM CB there would be limited impact
Overall assessment *(input for section 5.1)*	Positive impacts	Efficiency gains for RUs and cost savings for ECMs through reduced duplicative / overlapping customer certification request. Advantages through reduced diversity re requirements and methods applied in relation to the certification of ECMs as well as progress on clarity of responsibilities
	Negative impacts	Cost impacts notably for ECMs in relation to the certification. It should be noted that in general the direct costs involved for scope extension are relatively low. Attention should be given to the issue of small ECMs incl. possible maintenance market implications.

Category of stakeholder		*Option 5 – Combined with Option 4 + mandatory certification of maintenance workshops*
ECMs and Workshops	Positive impacts	See description for Option 4 for ECMs. There could be harmonisation benefits for MWs
	Negative impacts	Cost impacts for certification of MWs. In particular, this could be a concern for small MWs / ECMs.
RUs	Positive impacts	See description for Option 4
	Negative impacts	Efficiency gains may be somewhat lower due additional costs from additional certification for MWs
Keepers	Positive impacts	See description for Option 4
	Negative impacts	Cost implications from MW certification without significant additional benefits
RST leasing companies	Positive impacts	See description for Option 4
	Negative impacts	Cost implications from MW certification without significant additional benefits
ECM Certification Bodies	Positive impacts	See description for Option 4
	Negative impacts	See description for Option 4
National Safety Authorities	Positive impacts	See description for Option 4
	Negative impacts	See description for Option 4
Overall assessment	Positive impacts	The only change compared to Option 4 is the addition of

	(input for section 5.1)		mandatory certification for maintenance workshops. It follows that this option contributes well to the achievement of the established specific objectives although the level of achievement is somewhat lower compared to Option 5 due to the interactions with two certification schemes.
		Negative impacts	Cost impacts on maintenance workshops which could increase the overall costs of certification without bringing any additional benefits compared to option 4. There could be a risk of over-certification overlapping with the requirements for ECMs.

4.2. Impacts of the options (quantitative analysis)

The quantitative analysis (the specific assumptions on parameter values are set out in **Annex EcoEv 2**) includes in particular:

- Cost impact for ECMs and Maintenance Workshops:
  - one-off costs for initial certification under ECM
  - recurring costs per annum for surveillance activities by certification body as well as renewal of ECM certification
- Cost savings (benefits) for ECMs and RUs due to reduced duplicative certification systems and increased harmonisation
  - one-off cost savings are assumed insignificant
  - recurring costs savings (per annum) - the main cost changes concern any savings generated per annum by having reduced number of audits

Notes:

- For all categories the estimated quantitative impacts measure the change in **mill. Euros** relative to the baseline (Option 0 or Do-Nothing).
- In the case of one-off impacts the values are assumed to be incurred in a single year only (Year 0 in the CBA calculation).
- For recurring impacts the values shown are incurred each year over the assumed lifetime (20 years).
- Cost and benefit values given for stakeholder groups are expressed per entity. Therefore, in order to determine the total impact these values would need to be multiplied by the number of entities affected.
- Cost figures for ECMs and maintenance workshops include both internal and external items

These are estimates based on the input collected from the NSAs and the sector, grounded on assumptions and can therefore not be considered as being accurate measurements.

Category of stakeholder		*Option 0 (baseline)*	*Option 1*	*Option 2*	*Option 3*	*Option 4*	*Option 5*
ECM / MWs	Recurring benefits (euro)	0.00	0.014	0.016	0.014	0.016	0.015
	One-off costs (euro)	0.00	0.04	0.04	0.04	0.04	0.06
	Recurring costs (euro)	0.00	0.02	0.02	0.02	0.02	0.03
RUs	Recurring benefits (euro)	0.00	0.014	0.016	0.014	0.016	0.015
	Costs (euro)	0.00	0.00	0.00	0.00	0.00	0.00
Overall	Recurring benefits (euro)	0.00	2.6	5.8	7.9	11.7	10.9
	One-off costs (euro)	0.00	3.8	7.6	11.4	15.2	21.3
	Recurring costs (euro)	0.00	2.2	4.4	6.6	8.7	12.5

The NPV and B/C figures are calculated using a **4% discount rate** (in accordance with the EC Better Regulation Guidelines, 2017). Further details of the quantitative modelling of impacts are provided in **Annex EcoEv 3**.

As part of the validation of the CBA a sensitivity was performed for Option 4 reducing the cost savings potential from 25% to 12%. The results are also included in Annex EcoEv 3 showing a B/C ratio of 1.01 (and NPV value of 1.00 mln EUR).

	Option 0 (baseline)	*Option 1*	*Option 2*	*Option 3*	*Option 4*	*Option 5*
NPV *(input for section 5.2)*	*0.0*	*1.4*	*12.2*	*7.5*	*24.4*	*-43.2*
B/C ratio *(input for section 5.2)*	N/A	1.0	1.2	1.1	1.2	0.7

5. Comparison of options and preferred option

5.1. Effectiveness criterion (options' response to specific objectives)

On the basis of the findings from section 4.1 the extent to which the various options respond to the specific objectives have been assessed, using a scale from 1-very low response to 5-very high response. Subsequently, the individual scores for each option are added together and the average score per option is calculated (**effectiveness**).

	Option 0 (baseline)	*Option 1*	*Option 2*	*Option 3*	*Option 4*	*Option 5*
Increase the efficiency for RUs assurance of maintenance	1	2	4	3	5	4
Reduced duplicative customer certification	1	2	4	4	5	4
Reduced diversity of requirements and methods applied by CBs	1	2	4	3	5	4
Enhanced clarity in the definition / allocation responsibilities	1	2	4	3	5	4
Overall score	**4**	**8**	**16**	**14**	**20**	**16**
Effectiveness (average score)	**1**	**2**	**4**	**3.5**	**5**	**4**

5.2. Efficiency (NPV and B/C ratio) criterion

On the basis of the findings from section 4.2, the **overall efficiency** of the various options is rated as follows. The following principle for the scoring is adopted:

- 1 if B/C ratio <1 or NPV <=0
- 5 if B/C ratio >1 and NPV >0

	Option 0 (baseline)	*Option 1*	*Option 2*	*Option 3*	*Option 4*	*Option 5*
Efficiency	1	5	5	5	5	1

5.3. Summary of the comparison

In the following table the comparison of options is summarized taking into account both the effectiveness and efficiency dimensions.

	Option 0 (baseline)	*Option 1*	*Option 2*	*Option 3*	*Option 4*	*Option 5*
Effectiveness	1	**2**	**4**	**3.5**	**5**	**4**
Efficiency	1	5	5	5	5	1
Overall rating	1	3.5	4.5	4.3	5	2.5

5.4. Preferred option(s)	The following options are the two top ranked: › Option 4 (mandatory scope extension to all vehicles) has the highest effectiveness (5) and the highest NPV (24.4 mill. Euros) › Option 2 (voluntary scope extension to all vehicles) has a relatively lower effectiveness (4) and a relatively lower NPV (12.2 mill. Euros) It should be emphasised that although both options have positive net-benefits the order of magnitude for both benefits and costs are higher for Option 4 compared to Option 2. This has two implications: 1) the overall gains are higher for Option 4; 2) the costs involved would also be higher making this option more vulnerable. This implies that the choice of option would come down to a trade-off between net-benefits and financial risk. In this regard one particular factor that could be decisive for putting Option 4 forward would be any provisions for Agency monitoring of ECMs and ECM Certification Bodies. This is likely to add efficiency related benefits (not taken into account in the above figures of quantitative benefits). In particular, we have estimated the potential net-benefits of having in place a robust Agency monitoring of these organisations to involve up to 0.5 mill. Euros per annum. This could strengthen further the case for Option 4 with mandatory scope extension for all vehicles.
5.5. Further work required	Not foreseen

6. Monitoring and evaluation

6.1. Monitoring indicators	Preliminary proposal for headline indicators: › Overall level of correct implementation of the Regulation › Number of identified major non-compliances with the certification requirements per country and per application › Number of new, amended and renewed ECM certificates › Number of revoked ECM certificates Preliminary proposal for in-depth information requirements: › Overall perceptions and experiences of ECM certification by stakeholders (CBs, NSAs, ECMs, keepers, maintenance workshops, RUs/IMs, leasing companies) › Views on the implementation of specific elements of the Regulation (detected issues and advantages, non-anticipated results, etc.) › Actual implementation costs (focusing on obtaining practical information about costs incurred by the different parties) › Perceptions among ECMs on whether there are changes in resources used for applying for ECM certification and for preparing for the annual surveillance activities (with specific examples) › Perceptions among CBs on whether there are changes in resources used for assessing ECM certification applications and for carrying out surveillance activities (with specific examples) › Opinions from RUs/IMs and other stakeholders on the system established by ECMs to monitor their performance and the performance of their outsourcing partners › Views from ECMs, RUs/IMs and other stakeholders on the effectiveness of the communication arrangements for requesting information on the maintenance/operation of vehicles › Opinions from ECMs and maintenance workshops on the effectiveness of the exchange of views between NSAs and CBs to avoid duplication of assessments › Practical examples of the Regulation having influenced the opening of the market for maintenance services and/or interoperability in the EU. Key data sources may include: › Specific Agency monitoring activities regarding ECMs and CBs provided for in the revised Regulation › Annual reporting by NSAs on ECM certification and supervision › Monitoring of NSAs' activities by the Agency › Annual ECM reporting to CBs › Cooperation among CBs by the Agency › Dedicated interviews/surveys issued through the NSA Network and the Cooperation Bodies WP, as required.
6.2. Future evaluations	Based on the monitoring indicators and other relevant information, future *ex post* evaluations of this initiative may be considered, as required. Moreover, it could also be foreseen to provide for the

	preparation of a comprehensive implementation report in line with the case for the current ECM Regulation. Such a report could be prepared 4-5 years after the revised Regulation entered into force with the purpose of having an in-depth examination of return of experience as well as consideration to any adverse implications.

Annex EcoEv1: Problem drivers for impact assessment: practical examples

PROBLEM DRIVER		DETAILED EXPLANATION OF PROBLEM DRIVER + SOURCE OF IDENTIFIED PROBLEM DRIVER	EMPIRICAL EXAMPLES FROM IMPACT ASSESSMENT INFORMATION COLLECTION
Set A (current Regulation only covers freight wagons)	*Inefficient, complex and resource-intensive processes for RUs*	Such processes are currently needed to ensure that the maintenance of the vehicles fulfils the responsibility of RUs for safe operation. This is particularly the case when third party ECMs/maintenance providers or technically advanced rolling stock are used.	– There are national attestations of conformity for ECMs currently carrying out maintenance for other vehicles such as locomotives, coaches, OTMs – Companies may search abroad for workshops to do the job, it is not a nationally confined issue anymore – *Strong effort and coordination needed for simultaneous ISO 9001, VPI and ECM audits* – *Procedures of each audit are multiplied (e.g. absence of sampling), neutralising potential cost savings from reduction of multiple requirements by costumers* – *Lack of expertise in CBs, increasing the duration and/or the number of audits*
	Multiple / duplicative customer certification requests to ECMs and MWs	Such requests result in additional costs for ECMs and MWs and in difficulties for entering new market segments. The multiple request take in some cases the form of overreliance on product certification systems rather than process certification systems, thus limiting the possible efficiency gains from certification.	– *Request for simultaneous audits checking compliance with ISO 9001, VPI and ECM requirements* – *Each manufacturer imposes specific requirements for the maintenance of their RST, which prevents potential savings*
Set B (clarity and application of the current Regulation)	*Diverging interpretation in MS*	Diversity of how requirements and methods are applied due to diverging interpretation in MS (potentially leading to misinterpretation) of the current provisions on ECM certification. Existence of "unwritten and local" knowledge on how vehicles are maintained to be compatible with specific infrastructures, as well as a diversity of arrangements put in place by actors in different countries.	– Some ECM certificates with partial description of the functions are not recognised, it would be beneficial to describe the level of outsourcing of the maintenance functions in the company – There are also different rules on acceptability in MS. A balance must be found between how supervision activities are structured and how vehicles are maintained in order to be compatible with some infrastructures (which, in turn, makes them incompatible with infrastructures of other MS) – There is currently a huge diversity of standards – There are big discrepancies in the practice in the EU which should be considered [referring to the assessment and comparison of

			costs, due to the several stages with specific costs of the certification process] – *Lack of recognition of ECM certificates in other MS and re-assessment of certificates* – *Differences among CBs whilst defining the references/methodology for certification procedures (e.g. sampling of application and sites or not, composition of teams) and the scope of surveillance, with impact in costs* – *Differences in key-concepts for applying the Regulation such as "non-compliance" with the requirements, "return to operation", "repairs"* – *National rules (NTRs and NSRs) are an issue. A harmonised approach is needed in areas such as inspections so that e.g. wagons bought in one MS cannot be inspected elsewhere which limits an European market for ECMs*
	Definition and allocation of responsibilities among keepers, ECMs and RUs	Lack of clarity in the definition and allocation of responsibilities among keepers, ECMs and RUs operating vehicles, resulting in uncertainty among stakeholders and possibly in additional costs.	– When the ECM is based in one country, the keeper in another and the RU in another. This makes it difficult to react as regards supervision when there is a problem – Clearer distinction between the certification of ECMs and organisations providing services, such as delivery of maintenance would be welcome. It is not clear what "services" means – Some leasing companies are becoming keepers and ECMs – *Current coexistence of mandatory/voluntary certifications creating two different levels, with other vehicles being apparently less important. Some ECMs do not currently understand their roles for other vehicles* – *Court decisions are needed to clearly define responsibilities among stakeholders*

Annex EcoEv 2

Parameters used in the assessment of costs and benefits	Value	Unit
ECM initial certification costs (external)	**20000**	€
ECM Annual costs (external)	**11500**	€
Maintenance Workshop Initial certification costs (external)	8000	€
Maintenance Workshop yearly costs	5000	€
Coefficient for additional internal costs for preparation for certification / audits	1	
Assumed savings potential through reduced duplication	25	%
Number of ECMs affected by scope extension	760	
Proportion of identified ECMs likely not to be MW	50	%
Proportion of ECMs choosing to become certified under voluntary scheme	50	%

Explanations of parameter values

ECM initial certification costs (external)	Cost figure is based on collected information during the IA work formed as an average. It covers only the external costs for certification (not internal costs for ECMs)
ECM Annual costs (external)	Cost figure is based on collected information during the IA work formed as an average. It covers only the external annual costs reflecting either surveillance or renewal (which in terms of order of magnitude can be assumed to be similar)
Maintenance Workshop Initial certification costs (external)	Similar explanation as above (but in this case for Maintenance Workshops)
Maintenance Workshop yearly costs	Similar explanation as above (but in this case for Maintenance Workshops)
Coefficient for additional internal costs for preparation for certification audits	The value of 1 implies that it is assumed that the internal costs have a similar magnitude as the external costs
Assumed savings potential through reduced duplication	The assumption of 25% is in line with available evidence from efficiency analysis studies showing efficiency gains typically are in the region of 20-25%. Focusing only on ECM certification costs available evidence collected during the IA work suggests that the range could be from 15% to 35% (RSSB commissioned study "Supplier Assurance Framework Review and Analysis of Existing Supply Chain")
Number of ECMs affected by scope extension	The 760 number of ECMs affected by scope extension is based on the VVR analysis presented at WP No. 2
Proportion of identified ECMs likely not to be MW	The VVR analysis showed that more than half of the affected ECMs would be responsible for less than 100 vehicles. It is assumed that only half of the 760 ECMs would in fact be ECMs (most of these may rather fulfil the role of MW).
Proportion of ECMs choosing to become certified under voluntary scheme	The take-up rate under a voluntary scheme is assumed to be 50%

Annex EcoEv 3

Quantitative assessment of retained options

ECM CBA - Output Sheet	(Figures are in mln Euros)																					
Lifetime		20																				
Discount factor		0.04																				
Option 1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Costs	3.80	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	33.49 €
Benefits	0.00	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	34.94 €
Net-benefits	-3.80	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	
Break-even period	9.9																					
NPV	1.44 €		B/C Ratio	1.04																		
Option 2	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Costs	7.60	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.37	66.99 €
Benefits	0.00	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	79.19 €
Net-benefits	-7.60	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	
Break-even period	5.2																					
NPV	12.20 €		B/C Ratio	1.18																		
Option 3	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Costs	11.40	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	100.48 €
Benefits	0.00	7.95	7.95	7.95	7.95	7.95	7.95	7.95	7.95	7.95	7.95	7.95	7.95	7.95	7.95	7.95	7.95	7.95	7.95	7.95	7.95	107.98 €
Net-benefits	-11.40	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	
Break-even period	8.2																					
NPV	7.50 €		B/C Ratio	1.1																		
Option 4	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Costs	15.20	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	133.98 €
Benefits	0.00	11.65	11.65	11.65	11.65	11.65	11.65	11.65	11.65	11.65	11.65	11.65	11.65	11.65	11.65	11.65	11.65	11.65	11.65	11.65	11.65	158.37 €
Net-benefits	-15.20	2.91	2.91	2.91	2.91	2.91	2.91	2.91	2.91	2.91	2.91	2.91	2.91	2.91	2.91	2.91	2.91	2.91	2.91	2.91	2.91	
Break-even period	5.2																					
NPV	24.39 €		B/C Ratio	1.18																		
Option 5	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Costs	21.28	12.54	12.54	12.54	12.54	12.54	12.54	12.54	12.54	12.54	12.54	12.54	12.54	12.54	12.54	12.54	12.54	12.54	12.54	12.54	12.54	122.99 €
Benefits	0.00	10.93	10.93	10.93	10.93	10.93	10.93	10.93	10.93	10.93	10.93	10.93	10.93	10.93	10.93	10.93	10.93	10.93	10.93	10.93	10.93	88.61 €
Net-benefits	-21.28	-1.62	-1.62	-1.62	-1.62	-1.62	-1.62	-1.62	-1.62	-1.62	-1.62	-1.62	-1.62	-1.62	-1.62	-1.62	-1.62	-1.62	-1.62	-1.62	-1.62	
Break-even period	N/A																					
NPV	-43.23 €		B/C Ratio	0.72																		

Sensitivity testing of Option 4 (cost savings assumption 12%)

Option 4	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Costs	15.20	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	133.98 €
Benefits	0.00	9.93	9.93	9.93	9.93	9.93	9.93	9.93	9.93	9.93	9.93	9.93	9.93	9.93	9.93	9.93	9.93	9.93	9.93	9.93	9.93	134.98 €
Net-benefits	-15.20	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	
Break-even period	12.8																					
NPV	1.00 €		B/C Ratio	1.01																		