TECHNICAL SPECIFICATION

FOR PROCUREMENT

RIGA NODE OPERATION OPTIMISATION STUDY

Co-financed by the European Union
Connecting Europe Facility

Riga, 2019

CONTENT

1 INTRODUCTION AND REFERENCES

1.1 INTRODUCTION

The Baltic countries Estonia, Latvia and Lithuania have historically been linked to the east-west railway transport axis using the 1520mm gauge railway system. Because of the existing historical and technical constraints, the existing rail system is incompatible with mainland European standards, thus there is a consensus that Estonia, Latvia and Lithuania need to be fully integrated into the wider European rail transport system. Currently there is no efficient 1435 mm railway connection along the Warsaw-Kaunas-Riga-Tallinn axis, i.e. there are missing links or significant bottlenecks. Thus, there are no direct passenger or freight services along the railway axis as the existing infrastructure does not allow for competitive services compared to alternative modes of transport. Thus, the clear majority of the North-South freight is being transported by road transport and the overall accessibility in the region is low.

The ambitions of the Rail Baltica Global project (Global Project) are:

- to become a powerful catalyst for sustainable economic growth in the Baltic States;
- to set a new standard of passenger and freight mobility;
- to ensure a new economic corridor will emerge;
- sustainable employment and educational opportunities;
- an environmentally sustainable infrastructure;
- new opportunities for multimodal freight logistics development;
- new intermodal transport solutions for passengers;
- safety and performance improvements;
- a new value platform for digitalization and innovation;
- completion of Baltic integration in the European Union transport ecosystem.

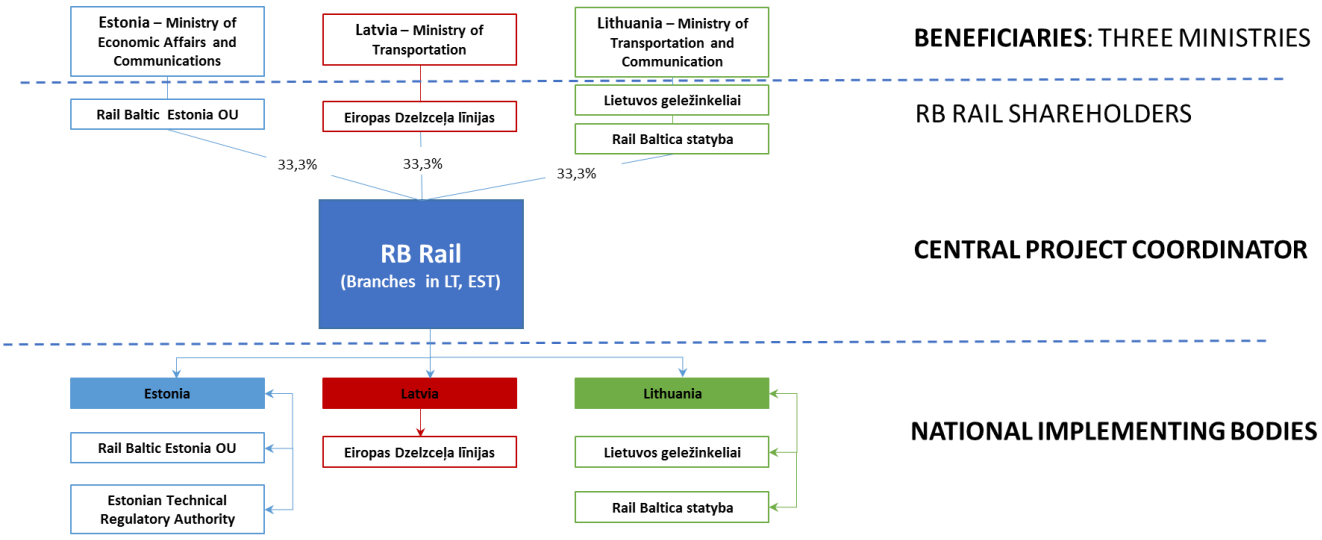
Rail Baltica is already designed to become a part of the EU TEN-T North Sea – Baltic Core Network Corridor, which links Europe's largest ports of Rotterdam, Hamburg and Antwerp – through the Netherlands, Belgium, Germany and Poland – with the three Baltic States, further connecting to Finland via the Gulf of Finland short sea shipping connections with a future fixed link possibility between Tallinn and Helsinki. Further northbound extension of this corridor shall pave the way for future connectivity also with the emerging Arctic corridor, especially in light of the lucrative prospects of the alternative Northern Circle maritime route development between Europe and Asia. Furthermore, the North Sea – Baltic Corridor crosses with the Baltic-Adriatic Corridor in Warsaw, paving the way for new supply chain development between the Baltic and Adriatic seas, connecting the Baltics with the hitherto inadequately accessible Southern European markets. In a similar fashion, Rail Baltica shall strengthen the synergies between North-South and West-East freight flows, creating new transhipment and logistics development opportunities along the Europe and Asia overland trade routes. The new Rail Baltica infrastructure would, therefore, not only put the Baltics firmly on the European rail logistics map, but also create massive opportunities for value creation along this infrastructure with such secondary economic benefits as commercial property development, revitalization of dilapidated urban areas, private spin-off investment, new business formation, technology transfer and innovation, tourism development and other catalytic effects. Rail Baltica aims to promote these effects from the early stages of the Global Project, learning from the key global success stories and benchmarks in this regard.

The contracting authority RB Rail AS (RBR) was established by the Republics of Estonia, Latvia and Lithuania, via state-owned holding companies, to coordinate the development and construction of the fast-conventional standard gauge railway line on the North Sea – Baltic TEN-T Core Network Corridor (Rail Baltica II) linking three Baltic states with Poland and the rest of the EU. The main technical parameters shall correspond to traffic code P2-F1 as per INF TSI (Commission Regulation 1299/2014/EU) and shall have the following main technical parameters:

- double track, design speed on the main track 249 km/h, design speed on side tracks minimum 100 km/h;
- axle load 25 t;
- distance between track centres 4.50 m on the main tracks;
- distance between two sided passing loops approximately 50 km and crossovers approximately 25 km but staged according to a train traffic forecast;
- all pedestrian, road and 1520mm rail crossings only as above or below grade crossings (segregated grade crossings), fencing and noise barriers where needed;
- ERTMS Level 2 with possible update to the newest version;
- communications system GSM-R with a view to accommodate the new generation railway communications standard;

- electrification 2x25 kV AC;
- station track length of 1050m;
- length of passenger platforms 405m for international stations and 210m for regional stations;
- height of passenger platforms 550mm;

The shareholders structure of RBR is presented in Figure 1.



RBR together with governments of Estonia, Latvia and Lithuania (represented by the ministries in charge of transport policy) have applied for the CEF co-financing in 2015, 2016 and 2017 (three applications in total). The first three applications were successful and INEA grants are available to support the Global Project expenses with up to 85% of co-financing in amount of 683 M. EUR.

Rail Baltica is a joint project of three EU Member States – Estonia, Latvia and Lithuania – and concerns the building of a fast-conventional double track 1435 mm gauge electrified railway line on the route from Tallinn through Pärnu (EE), Riga (LV), Riga International Airport (LV), Panevėžys (LT), Kaunas (LT) to the Lithuania/Poland state border (including connection Kaunas - Vilnius). In the longer term, the railway line could potentially be extended to include a fixed link between Helsinki and Tallinn, as well as integrate the railway link to Warsaw and beyond.

The expected core outcome of the Rail Baltica project is a European gauge (1435mm) double-track railway line of about 870 km in length meant for both passenger and freight transport and the required additional infrastructure (to ensure full operability of the railway). It will be interoperable with the TEN-T Network in the rest of Europe and competitive with other modes of transport in the region. The indicative timeline and phasing of the project implementation can be found here: http://www.railbaltica.org/about-rail-baltica/project-timeline/.

Further information is available in http://www.railbaltica.org/

1.2 ABBREVIATIONS AND TERMS

Administrative

Beneficiary	Ministry of Transport of Latvia
CEF	*Connecting Europe Facility.*
Contracting authority, RB Rail AS,	A joint venture established by the Republics of Estonia (EE), Latvia (LV) and Lithuania (LT), via 100% state-owned special purpose vehicles, to design, construct and market a new fast-conventional standard gauge double track railway line on the North Sea – Baltic TEN-T Core Network Corridor linking three Baltic states with Poland and the rest of the EU. For the present Study, the Contracting Authority is acting on behalf of the Beneficiary.
CD	*Commencement Date* of the Contract
Consolidated procurement	A procurement conducted jointly by several contracting authorities in the meaning of Article 39(4) of the Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 On Public Procurement and Repealing Directive 2004/18/EC and several contracting entities in the meaning of Article 57(4) of the Directive 2014/25/EU of the European Parliament and of the Council of 26 February 2014 On Procurement by Entities Operating in the Water, Energy, Transport and Postal Services Sectors and Repealing Directive 2004/17/EC.
Consulting services	all necessary activities being and to be implemented by the Contractor as required in the Contract.
Contract	Signed agreement between Contracting authority and Contractor to prepare Study through the provision of Consulting services defined in this agreement.
Contracting Scheme	Agreement on the Contracting Scheme for the Rail Baltic / Rail Baltica reached between beneficiaries and implementing bodies of the Republic of Estonia, the Republic of Latvia and the Republic of Lithuania with the aim to maximise the economic efficiency via consolidation of procurements with potential economies of scale, ensure full and optimum interoperability, quality control and efficient supervision and put in place the best practise procurement model to ensure transparency and minimise corruption risks by putting a single organization, the joint venture RB Rail AS, in charge of purchasing those elements of the Rail Baltica railway infrastructure, and associated studies, plans and designs, which are either for common benefit or which are crucial to the entire Rail Baltic / Rail Baltica railway infrastructure.
Contractor	Service provider awarded with a Contract to conduct Study.
Design guidelines	Set of predefined and standardized technically and economically justified engineering and design solutions for Rail Baltica Railway infrastructure to be applied at design, construction and operation phases.
EU	*European Union.*
National[1] studies	Detailed engineering and feasibility studies on implementation of Rail Baltica in each of the three Baltic states, covering EIA, preliminary design, feasibility studies, spatial planning and similar activities.
Rail Baltica Global Project	Future railway line (for definition of key technical parameters, please see "Rail Baltica railway" below) eliminating missing links in the European railway network and establishing a fully-interoperable railway infrastructure on the route Warsaw – Kaunas – Riga – Tallinn – Helsinki, with branch line to Vilnius, and ensuring full railway interoperability and

[1] Terms *national* or *local* cover each Baltic state, if not stated otherwise.

	better railway usage indicators in passenger and cargo traffic. The project ensures Baltic State integration into the EU railway area. The project is the part of the TEN-T core network North Sea-Baltic corridor.
Rail Baltica railway	a new fast conventional double track electrified European standard gauge (1435mm) railway line on the route from Tallinn through Pärnu-Riga-Panevėžys-Kaunas to Lithuanian-Polish border, with the connection of Kaunas - Vilnius;
Railway infrastructure	Has the same meaning as an identical term in the Directive 2012/34/EU of the European Parliament and of the Council of 21 November 2012 establishing a single European railway area (recast), as well as it includes freight and passenger terminals and infrastructure and rolling stock maintenance facilities and the ground underneath them and the airspace above them to the extent that the national legislation permits the ownership of the ground and the airspace.
Technical specifications	The present document forming a part of Service procurement regulations and Contract following the procurement procedures;
Technical Working Group	Group composed of representatives of Stakeholders of the Study.

Service specific, technical

1435	Short reference to the 1435 mm track gauge railway infrastructure, operation or any other parameter or element linked this specific gauge. 1435 mm gauge infrastructure in the Baltic States is implemented by Rail Baltica project.
1520	Short reference to the 1520 mm track gauge railway infrastructure, operation or any other parameter or element linked this specific gauge. 1520 mm gauge public infrastructure in Latvia is managed by Latvian Railways (LDz). Additionaly, side tracks and terminals may be privately owned.
Railsys	Traffic Simulation software used by RB Rail
Railway Core Study Area	The quadrilateral Imanta – Tornakalns - Janavarti – Zemitani
Railway Node	Railway configuration, which include stations, tracks, junctions, bridges, tunnels, service and maintenance facilities to serve cargo and passenger flows in a geographical location, typically a city
Railway line section	Section of the Railway between two kilometer points or stations, generally equipped with dual track, with stations, sidings and necessary maintenance facilities
Study	Investigation of the operational constraints of the Riga Node and elaboration of feasible solutions, provided by the Contractor.
Study programme	Study programme, proposed by the Contractor and approved by the Contracting authority, shall include graphical representation of main Study's milestones and summarised textual description of the services to be provided as required in Technical specification.
TSI	*Technical Specifications for Interoperability*.
TWG	*Technical work group*, group of RB Rail experts, experts from stakeholders and involved parties nominated by the Contracting authority.
WP	*Work package*, a defined part of Contractor's activities, to be carried out under the Contract's requirements.

1.3 DOCUMENTS, STUDIES AND INFORMATIONS TO BE TAKEN INTO ACCOUNT

1. Within the framework of the Contract the Contractor shall consider the following non-exhaustive list of documents, studies, study projects, spatial development planning documents and any other documents required for service provision as well as online internet sources:

Ref.	Title of document, date of issuance, web link[2]
1	Rail Baltica Global Project Cost-Benefit Analysis, 2017 http://railbaltica.org/cost-benefit-analysis/
2	Design guidelines for Rail Baltica railway, in force version (relevant parts shall be provided during Study implementation), presentation slides: http://www.railbaltica.org/wp-content/uploads/2018/04/Elodie_Faivre_RBGF2018_Day2.pdf; presentation video: https://www.youtube.com/watch?v=5qEIXQWhNZQ&t=1s
3	Operational plan for the railway, 2019 http://www.railbaltica.org/about-rail-baltica/documentation
4	Integration of Rail Baltica railway line within the Riga central multimodal public transportation hub – Elaboration of technical solution, 2015 (Riga Station AECOM Study) http://edzl.lv/en/progress-of-the-project/study
5	International sketch design competition for the central multi-modal public transport hub in Riga and the Rail Baltica railway bridge
6	Information on the regional public transport service development 2021-2030 http://tap.mk.gov.lv/lv/mk/tap/?pid=40473219&mode=mk&date=2019-06-04 (available only in Latvian)
7	Pasažieru Vilciens ET Business Model, 2015
8	Pasažieru Vilciens Long distance and Regional Traffic Business Model, 2019 (Ongoing, first draft expected September 2019) Available only in Latvian.

- Documents for which Internet link is not mentioned will be provided at inception of the study.
- The Contractor shall consider all other significant information and documents with either direct or indirect relation to the study project, or providing background information;
- The Contractor shall consider all relevant national as well as EU standards and Technical Specifications for Interoperability.

[2] Contracting authority shall not be responsible for the availability and content of the information available online (except for www.railbaltica.org website).

2 CONTENT OF THE ASSIGNMENT

2.1 OVERALL FRAMEWORK

2. The objective of this assignment is to prepare a detailed operational study for Riga railway node for both railway gauges 1435 mm and 1520 mm, for short (2026) medium (2036) and long (2046) term.

3. This study is subsequent to the elaboration of the Rail Baltica Operational Plan Concept, completed in 2018, which recommended to perform a more detailed analysis for Riga node, including analysis of capacity and timetable stability and the required track layout.

4. The major targets of the study are to identify limiting factors and propose optimisation measures for the railway infrastructures inside Riga urban area in order to maximise the modal shift of passengers to rail transport, and to maximise socio-economical efficiency of the planned investments. The Study shall consider the benefits for end users of a single fully integrated railway transport system, even if managed by separate infrastructure managers and operators. Long-term perspective is necessary in order to plan appropriately the infrastructure evolutions needed to answer to present and future passengers transport demand, including smoothless intermodality.

5. For the 1435 mm gauge, Rail Baltica railway Operational Plan Concept study delivered a detailed analysis of the situation, and the main constraints are the following:

    - There is an absence of sidings in central section going through Riga, which excludes overtaking of trains on the75 km long railway section between Vangazi and Iecava stations;
    - There are constraints on Riga Airport (RIX) station track layout, due to airport activities;
    - There is insufficient number of tracks in Riga station to accommodate the expected traffic;
    - It is impossible to turn back the trains terminating in Riga and RIX stations without occupying the opposite direction main track;
    - There is only a single-track section on 3 km on East of Riga station;
    - Junctions on North and South side of Riga urban areas are contraints of train operation;
    - Suitable location for layover / depot facilities needs to be reconsidered.

    The identified constraints shall be resolved in order to finalise the Detailed Technical Design of Riga node stations and open line sections which shall be completed at latest in 2021, In particular, as design of Riga station is starting, it is necessary to present recommendations regarding track layout.

6. For the 1520 mm rail gauge, planned investments and projects in coming years present a unique opportunity to adapt the overall railway system, to adapt it with the future traffic needs:
    - Reconstruction of Riga station with new track layout (in consequence of Rail Baltica implementation);
    - Reconstruction of section Imanta – Tornakalns - Riga station – Janavarti with new track layout and integral fencing of the right-of-way (in consequence of Rail Baltica implementation);
    - Electrification of lines in 25 kV, including conversion of the lines presently electrified in 3 kV DC to 25 kV AC;
    - Renewal of 32 electrical train sets (EMU) with maximum speed 160 km/h for Riga suburban passenger service;
    - Development plan of non-electrified suburban and regional lines currently operated by DMU;
    - Construction of a new maintenance facility for the EMUs and decommissioning of existing ones with possibility of reaffectation of the territories.

Mutual support of both 1435 and 1520 railway networks shall maximise positive effects and benefits for passengers on the railway system level. That is why the level of utilisation of each of the networks, e.g. number of passengers per day, passenger flows, interconnections shall be optimised.

Additionaly, there is a strategic orientation of Latvian Ministry of Transport to increase the market share of rail for passenger transportation everywhere it is relevant. In this regard, the destination not served today from Riga presenting an interesting potential shall be considered (Tartu, Liepaja, Ventspils, Klaipeda, Minsk…). Regarding freight traffic, as Latvia is joining Rail Freight Corridor Nord Sea Baltic, the market share for cargo traffic on Nord – South direction shall increase as well.

The ***Service areas*** are defined as line sections (any gauge) located in concentric areas with Riga station as center in which different passenger services shall be developed:

- Suburban area (Electrified line sections up to Jelgava, Tukums, Aizkraukle, Skulte; Non-electrified line sections up to Sigulda and Bolderaja)
- Regional (including cross border regional) area (Non-electrified line sections up to Daugavpils, Rezekne, Ventspils, Liepaja, Madona-Gulbene, Valga-Tartu, Siauliai-Klaipeda)
- International day area (Line sections up to Tartu, Siauliai-Klaipeda, Kaliningrad, Minsk)
- International night area (Line sections up to Minsk, Kiev, Moscow, St Petersbourg)

7. The ***Study areas*** are defined as line sections (any gauge) located in concentric areas with Riga station as center in which different level of study shall be developed:
   - The quadrilateral Imanta – Tornakalns - Janavarti – Zemitani is the ***railway core area*** due to the 1520 infrastructure to be reconstructed, and to location of depots. In this area, the track layout shall be defined in detail for all the tracks used in normal and degraded train operation;
   - Riga suburban area (as Service area defined above) where traffic is the most important. In this area, only principles and locations for track layout upgrade shall be defined.
   - Destinations from Riga by regional and international trains: In this area, only recommendations for principles and locations for track layout upgrade shall be defined.

Railway core study area for Riga node Operational Study

8. The performance of the study for Riga node Operational Study requests railway engineering technical and operational analysis, transversal approach from future customers' needs to realisation of transport offer, and extensive and iterative communication of involved stakeholders to consider and take into accounts various requirements. The study shall be carried out in 4 work packages:

   - **WP1 - Assessment of present status and expectations** (covers review of previous studies, interviews and meetings with Stakeholders and delivery of a report summarising all requirements, stakes and principle positions which are relevant for the performance of the Study);

   - **WP2 - 1520/1435 mm operational concept** (covers definition of trains services, definition of integrated 1435/1520 timetable, analysis of possible layover tracks and passengers rolling stock maintenance facilities, possible 1520/1435 rolling stock maintenance facilities location and functionalities);

- **WP3 - Infrastructure studies and modelling** (covers analysis of 1520 infrastructure track layout, recommendations for upgrade to implement the integrated 1435/1520 timetable and Operation software modelling simulation of the planned operation on 1520 mm gauge network);
- **WP4 - Recommendations and way forward for implementation** (covers outputs of WP3 and recommendations for 1520 mm and 1435 mm infrastructure track layout adjustments, rolling stock maintenance facilities location and functionalities, recommendations and way forward for implementation for the TP 2026 and 2046, analysis of operational situation during reconstruction, as well as presentation to Stakeholders).

9. The timeframe defined as pertinent for the Study is declined around 3 specific years, hereafter called ***Time Periods (TP)***:
   - TP1: 2026. Rail Baltica railway planned start of operations for high speed, night, regional and cargo services. The 1520 infrastructure section Janavarti – Imanta reconstruction is completed. The 1520 section Riga – Rezekne / Daugavpils electrification in 25 kV is completed. The Roll out of new 1520 EMUs is completed. The necessary rolling stock maintenance facilities for both gauges are in operation. The volume of 1520 cargo traffic through Riga node is according LDz forecast, the transfer of port terminal to left bank area is completed.
   - TP2: 2036. Rail Baltica regional services in operation according Operational Plan. The second phase of the 1520 25 kV electrification is completed. Part of regional and international 1520 lines are in operation. The volume of 1520 cargo traffic through Riga node is according LDz assumptions.
   - TP3: 2046. Rail Baltica services are in operation according Operational Plan. 1520 The 1520 25 kV electrification finalized. All regional and international 1520 lines are under operation. The volume of 1520 cargo traffic through Riga node is according LDz assumptions.

   TP3 is the time period for which the 1520 infrastructure parameters and track layout shall be defined, taking into account the traffic at that time. (Rail Baltica Operational Plan was also considering 2056 as fourth Time Period, with assumption that FinEst Link and infrastructure in Finland started their operation in 2050. In the present study, 2056 is not considered, as no changes in 1435 mm track layout inside Riga node area are expected).
10. The Contractor shall perform necessary analyses and studies, and report conclusions and deliverables ***for the three time periods TP1 to TP3.***
11. At each stage, according to section 55 of this Technical Specification, the Contractor shall submit reports to the Contracting Authority along with a presentation of the progress made within each stage, based on which the latter may take relevant decisions on the further fulfilment of the Service.

2.2 ASSESSMENT OF PRESENT STATUS AND EXPECTATIONS (WP1)

12. The Contractor shall identify and analyse the present and future situation for 1520 railway infrastructure and operation, as well as for the planned 1435 railway, on the basis of all available and provided information, studies and interviews of stakeholders' representatives, mentioned below.
    - **Ministry of Transport of Republic of Latvia:** Project Beneficiary
    - **RB Rail AS:** Rail Baltica Project coordinator
    - **LDz:** 1520 Infrastructure Manager
    - **ATD:** Latvian passenger transport authority
    - **Valsts dzelzceļa tehniskā inspekcija (VDzTI):** National safety authority
    - **Valsts dzelzceļa administrācija (VDA):** Railway regulatory authority

- **LatRailNet:** state body responsible for 1520 infrastructure capacity allocation
- **Pasazieru Vilciens:** 1520 mm train operator
- **L-Ekspressis:** international night train operator
- **LDz Cargo:** 1520 mm main cargo operator
- **Baltijas tranzīta serviss:** 1520 mm cargo operator
- **Baltijas Ekspresis:** 1520 mm cargo operator
- **EDzL:** Rail Baltica Latvian Implementing Body (local facility implementer, including Riga and RIX stations)

13. The Contractor shall review all information and prepare a report summarising the initial positions, expectations, possible involvement and role in the different time horizons. The Contractor shall propose a methodology for input data collection, interview of Stakeholders and structuration of summarizing report.
14. The Contractor shall present in a specific part of the report a list of requirements, classified by type, origin and importance, to ensure technical and methodological consistency between the requirements. When relevant, a brief technical explanation shall be provided.
15. The Contractor shall have understanding the socio-economic data, as for example traffic flows, population of main destination, mobility level, GDP and other indicators evolution… in consider them his analysis and outline the most relevant ones which will be used as basic hypothesis in the next phase of Study, for the 3 TP considered.

2.3 1520/1435 MM OPERATIONAL CONCEPT (WP2)

16. **WP 2.1 – Definition of 1520 mm operational principles** – the Contractor shall elaborate the main parameters of the train services to be operated in the Service areas and define the main principles for they operation, for the 3 TP considered.
17. The Contractor shall base the definition of the suburban services on the joint transport plan of ATD and operator Pasazieru Vilciens, amended by Contractor's proposals, supported by elements from benchmarking of similar situations.
18. The Contractor shall base the definition of the regional services on the transport plan of ATD and the operator Pasazieru Vilciens, amended by Contractor's proposals, supported by elements from benchmarking of similar situations.
19. The Contractor shall elaborate possible international day services for all the relevant destinations, on the base on his experience and supported by elements from benchmarking of similar situations.
20. The Contractor shall elaborate possible international night services for all the relevant destinations, on the base on his experience and supported by elements from benchmarking of similar situations.
21. The Contractor shall base the definition of the freight services through the railway core area on the transport plan of the freight operators and on the minimal capacity requirements LDz, amended by Contractor's proposals, supported by elements from benchmarking of similar situations.
22. The Contractor shall consider in the definition of the 1520 services the timetables defined in Rail Baltica Operational Plan for the 3 TP considered, in order to ensure optimal 1435/1520 intermodality for passengers in Riga station and in common regional stations.
23. **WP 2.2 – Definition of 1520 mm typical rolling stock fleet** – On the basis of information supplied by the relevant passengers' operators and their experience, the Contractor shall elaborate a list of typical rolling stock to operate the services, and their main technical parameters (type, capacity, weight, power, electrification sytem, signalling system, weight, maximum speed, acceleration, service braking…) needed to perform the passenger services. The number of rolling stock necessary for each

TP shall be calculated. Only information necessary for the performance of the present Study shall be investigated.

24. On the basis of information supplied by the relevant freight operators and on Contractor's experience, the Contractor shall elaborate a list of typical rolling stock and typical type of trains (intermodal, bulk…) to be operated through the railway core area, and their main technical parameters (type, capacity, power, weight, maximum speed, acceleration, service braking…) needed to perform the freight services. The quantity of rolling stock necessary shall not be estimated, taking the assumption it is available in both quality and quantity for the freight operators. Only level of information necessary for the performance of the present Study shall be investigated.

25. **WP 2.3 – Definition of passengers rolling stock layover tracks and maintenance facilities**– On to the basis of work performed on previous work packages and available studies, the Contractor shall evaluate the needs in layover tracks and maintenance facilities for the 1520 passenger rolling stock fleet and describe their necessary functionalities.

26. The Contractor shall analyse the potential locations possible for the 1520 layover tracks and passengers rolling stock maintenance facilities, analyse all the constraints and opportunities of every locations, propose a methodology to determine the best possible solution, based on objective criteria.

27. Based on Rail Baltica Operational Plan outputs, the Contractor shall analyse the potential locations possible for the 1435 layover tracks and passengers rolling stock maintenance facilities, analyse all the constraints and opportunities of every locations, propose a methodology to determine the best possible solution, based on objective criteria.

28. The Contractor shall analyse the possibility of mutualising the passengers rolling stock maintenance facilities for 1520 and 1435 EMUs.

29. **WP 2.4 – Definition of integrated 1435/1520 timetable** – On to the basis of work performed on previous work packages, the Contractor shall evaborate one integrated 1435/1520 timetable for every TP. The timetable shall include all movements of passengers' trains from/to layover tracks and rolling stock maintenance facilities.

2.4 INFRASTRUCTURE STUDIES AND MODELLING (WP3)

30. **WP 3.1 – Analysis of 1520 infrastructure parameters** – The Contractor shall collect and analyse the available 1520 infrastructure data, in order to gather all needed information to prepare the integrated 1435/1520 timetable.

31. Existing 1520 infrastructure technical documentation will be made available to the Contractor. These documents include detailed parameters (gradient, profiles, stations and junction location and configurations, signals location…) with various level of details. The Contractor shall define the type and level of detail of input data needed to the performance of the Study. The Contractor shall review the existing documents, extract the necessary data, and propose assumptions to complement them to be able to perform the Study. The analysis shall be made in detail on the railway core area for all the tracks used in normal and degraded train operation, and only to the extend necessary to the definition of the operation plan for the other areas.

32. LDz electrification project includes the reelectrification of the existing 3 kV DC suburban lines in 25 kV AC, as well as the electrification in 25 kV AC of part of the regional lines. The planning of the LDz electrification project will be made available to the Contractor.

33. The Signalling systems implemented on 1520 are computer-based or relay-based interlocking with coded track circuits (ALSN). The Contractor shall take into account the 1520 rules and functionalities and the requirement to maintain consistency and interoperability of the 1520 railway system. Improvements and additional functionalities could be proposed by the Contractor, in particular regarding increase of capacity and operational flexibility of 1520 railway system for the Time Periods considered.

34. **WP 3.2 – Study area software modelling** – The Contractor shall perform the software modelling of the 1520 railway infrastructure and operation, at least for the railway core study area, and for the integrated 1435/1520 timetable for every time period prepared in WP2.

35. On the basis of the information collected on type of services, rolling stock fleets and infrastructure parameters, the Contractor shall create a software model of the 1520 operation situation, for every time period.
36. The Railsys model for 1435 infrastructure and operation, delivered as Rail Baltica Operational Plan study, will be made available to the Contractor. The Contractor shall update this model if necessary to take into account main outputs of this Study. As the target of the Study is to deliver a decision tool based on the integrated 1435/1520 timetable, a common model is not requested. However, the Contractor shall ensure synchronisation of 1435 and 1520 timetable between the model, by application of the intermodality principles defined in WP2.1.
37. The modelling software to be used, shall be the most adapted to the purpose of the Study, according Contractor experience.
38. The software model shall be created in a format compatible with Railsys (which is the software in use inside RB Rail), the possibility to import the infrastructure model inside Railsys shall be warrantied, using RailML format or equivalent.
39. The modelling software shall allow following visualisations for each Time Period (TP):
    - 1520 Infrastructure schematic layout, including all needed elements (block sections, turnouts, signalling devices, stations, platforms, level crossings, bridges, layover tracks and passengers rolling stock maintenance facilities tracks, …);
    - Typical busiest day 24-hour space / time diagram, including all train services;
    - Stations platform occupation diagram;
    - Maximum speed allowed by infrastructure;
    - Speed of every particular train;
    - All train movements, including shunting and between passengers' stations and layover tracks and passengers rolling stock maintenance facilities.
40. The Contractor shall create the model for the entire study area, however only the railway core area shall be modelled in detail, the surburban and international destinationions areas could be modelled with the level of detalisation necessary for the Study.
41. The Contractor shall create the model for the TP 2046, which is the long-term perspective. The situation for short- and medium-term Time Periods will be assessed in the next WP 4.2.
42. The Contractor will deliver the model and summarise the outputs in report presenting the operational situation, with the following (but not limited to) content:
    - Considered track layout and infrastructure elements;
    - Considered typical rolling stock used to perform the services;
    - Maximum speed diagrams for all routes, tracks and junctions;
    - Detailed definition for each passenger and freight services, taking into account rolling stock used, stations or freight facilities served, timetable of every train.
    - Train space time diagrams for the whole study area;
    - Assumptions taken for necessary parameters (reliability margin, dwell times, traffic windows…);
    - Situation in busiest peak hour (dimensioning case) and in other hours on a typical day;
    - Flow diagrams in railway nodes;
    - Conflict and bottleneck areas;
    - Calculation of trains services at different relevant speeds.

2.5 RECOMMENDATIONS AND WAY FORWARD FOR IMPLEMENTATION (WP4)

43. **WP 4.1 – Recommendations regarding 1520 and 1435 infrastructure design parameters for TP 2046** – On the basis of previous studies, software simulation results and his experience, the Contractor shall provide statements and recommendations regarding the infrastructure design parameters for 2046, with detailed justifications.

44. The objective of the statements and recommendations is that the designed configuration will fulfill the requirements for train capacity, flexibility, reliability and cost-effective operation, in full compliance with the integrated 1435/1520 timetable service needs as defined in WP2.1.

45. Concluding statements and recommendations shall focus on general infrastructure design parameters, including (but not limited to): gradients, curve radius, speeds on deviated turnouts, number of tracks in stations and open line, stations configuration, platform dimensions, location and configuration of layover tracks and passengers rolling stock maintenance facilities, …), signalling (headway…), control and electrification systems features or for specific cases and locations, where it is suggested to modify the design parameters.

46. Infrastructure configuration recommendations shall take into consideration the operation of different type of trains and services, as well as the infrastructure maintenance typical requirements.

47. Infrastructure configuration recommendations shall be realistic and feasible, taking into account the constraints of different projects in the Riga node area. The Contracting Authority shall be responsible for assessing the feasibility of the recommendations proposed by the Contractor, in close cooperation with the relevant Stakeholders.

48. Concluding statements and recommendations shall be provided in a summary table based on geographical entries (km point, station…). Schematic track layout of recommended 1520 and 1435 infrastructure for 2046, summarising a graphical way the proposed infrastructure configuration shall be delivered.

49. **WP 4.2 – Recommendations regarding 1520 and 1435 infrastructure design parameters for 2026, 2036 and for implementation period**

50. On the basis of provious work packages, the Contractor shall provide statements and recommendations regarding the infrastructure design parameters for 2026 and 2036, with detailed justifications. Particular attention shall be given to the configuration of infrastructures needed for each time period, according traffic forecasts and corresponding services. Schematic track layout of recommended 1520 and 1435 infrastructure for 2026 and 2036, summarising a graphical way the proposed infrastructure configuration shall be delivered.

51. Recommendations shall take into account the specific constraints of the LDz electrification project, which may need the coexistence of 25 kV AC and 3 kV DC during these periods, and therefore may impact the 1520 infrastructure configurations. Regarding 1435 infrastructure, recommendations shall be consistent with output of Operational Plan, whith necessary amendment proposed by the Contractor.

52. The Contractor shall analyse the situation of 1520 infrastructure during implementation period as currently planned and provide recommendations and way forward. In particular, the analysis shall cover the ability of the current track layout to be modified to reach the infrastructure design parameters for TP 2026, and the transitional period during reconstruction. The impact of reconstruction works of Riga station, Riga – Imanta and Riga – Janavarti sections on train operation shall be assessed, at capacity and reliability point of view. Necessary operation restrictions shall be detailed, and recommendations for phasing of reconstruction works provided.

3 CONTRACT'S PROJECT MANAGEMENT

3.1 DELIVERABLES AND DEADLINES

53. Consulting services to be provided by the Contractor shall consist from presence activities in premises of RB Rail AS in Riga and remote activities performed in premises of the Contractor.

54. Presence activities include workshops, presentations of study reports and results, moderation of discussions, introduction of solution-options to decision makers, monthly progress reports (three progress reports are expected).

55. Each progress report shall describe study progress on not more than 5 (five) pages and include following parts:

    - overall progress summary in relation to the plan agreed;
    - overview of works completed since last progress report;
    - overview of works currently in progress (one-month plan);
    - overview obstacles, problems and risks;
    - overview remaining work.

56. The Contractor shall provide at least 2 (two) days of presence in premises of RB Rail AS during each three-week period of the contract (starting from the kick-off meeting) according to description added in Section 62 of this Technical specification.

57. Remote activities shall be carried out in the premises of the Contractor and shall include independent work on study contents and work packages, elaboration of traffic model, study documents and incorporation of study results in to interim and final reports, presentations, etc.

58. The Contractor shall incorporate results of the study in to reports listed in the table below. All interim reports and Final report shall be accompanied with Power Point presentations highlighting main results and findings.

No.	Deliverable	General scope[3] of the deliverable
1.	Inception report	Detailed description of study approach and work programme. Overview of study management plan, incl. timeline, resources, deliverables and risks. Table of contents First interim Report
2.	First interim report	Full scope of WP 1 Table of contents Second interim Report
3.	Second interim report	Revised scope of WP1 Full scope of WP 2 & WP 3 Table of contents Final Report
4.	Draft final report	Revised scope of WP1, WP2, WP 3 Full scope of WP 4

[3] Minimal required scope of a corresponding deliverable is provided. During the Study preparation the scope of particular deliverable may cover a part of other deliverable depending on specific circumstances.

5.	Final report	Adjusted and finalised Draft final report including reports on results of all Work Packages demonstrating full service provision in accordance to the Contract Final completion report as described in section 87

59. Deliverables shall be delivered by the Contractor according to the following deadlines of suggested delivery schedule:

No.	Deliverable	Deadline	Payment, %
1.	Approved Inception report	(not later than 3 weeks after CD[4])	10
2.	Approved First interim report	(not later than 5 weeks after CD)	10
3.	Approved Second interim report	(not later than 10 weeks after CD)	30
4.	Approved Final report	(not later than 16 weeks after CD)	50

60. The Contracting authority will review and send comments to submitted report in one week (5 working days) after receiving the documents. Upon receiving these comments, the Contractor shall adjust report in 1 (one) week period (5 working days) and submit it to the revision or approval by the Contracting authority.

61. Decision on Final Report approval shall be provided no later as within ten (10) working days after submission of the Final Version of the Final Report after review interactions according to 62.

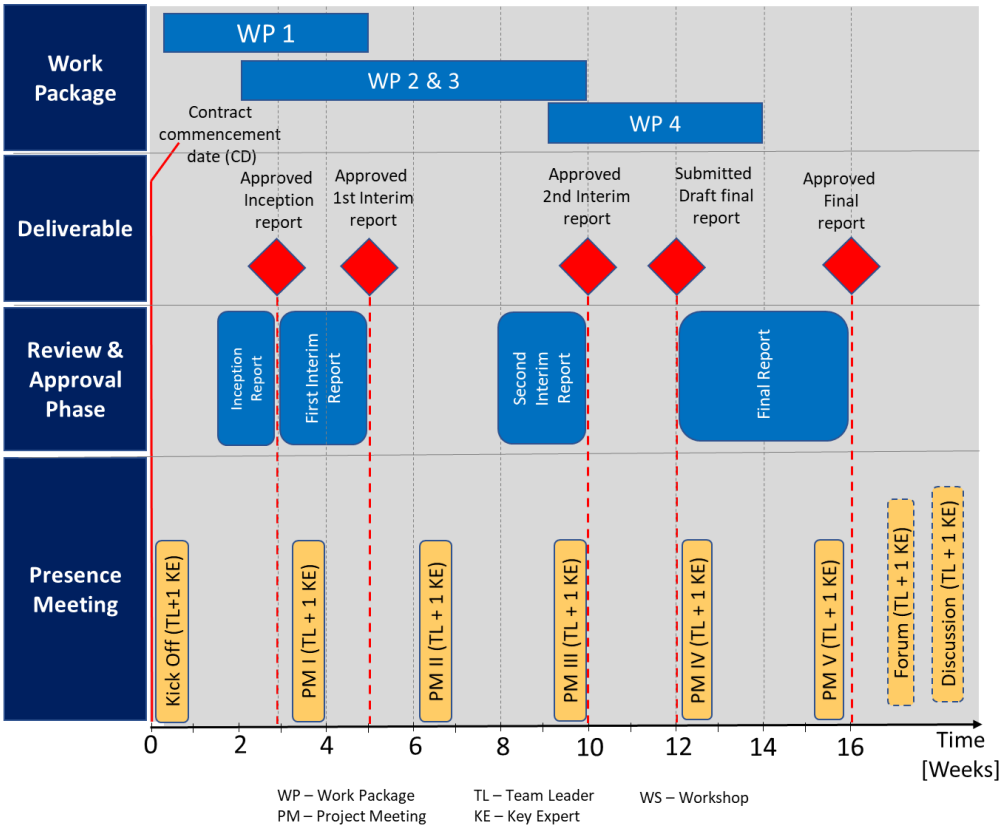
62. One iteration of review and approval process is planned for inception report, two iterations for interim reports and three – for the final report respectively. Both parties are entitled to submit documents earlier or in parts in order to speed up review and approval process. Please refer to the table below describing the review and approval deadlines in detail:

NO.	DELIVERABLES/ REPORTS	DRAFT VERSION		REVIEW AND APPROVAL	FINAL VERSION	
		Deadline	No. of copies		Deadline	No. of copies
1.	Inception Report	CD [5]+ 2 weeks	1 soft copy	1 week (1 iteration)	CD + 3 weeks	2 hard copies, 1 soft copy
2.	First Interim Report	CD + 3 weeks	1 soft copy, Power Point presentation	2 weeks (2 iterations)	CD + 5 weeks	2 hard copies, 1 soft copy, Power Point presentation
3.	Second Interim Report	CD + 8 weeks	1 soft copy, Power Point presentation	2 weeks (2 iterations)	CD + 10 weeks	2 hard copies, 1 soft copy, Power Point presentation

[4] CD - Contract commencement date.
[5] CD - Contract commencement date.

NO.	DELIVERABLES/ REPORTS	DRAFT VERSION		REVIEW AND APPROVAL	FINAL VERSION	
		Deadline	No. of copies		Deadline	No. of copies
4.	Final Report	CD + 12 weeks	1 soft copy, Power Point presentation	2 weeks (2 iterations) + 2 weeks (approval)	CD + 16 weeks	3 hard copies, 1 soft copy, Power Point presentation

63. The suggested delivery schedule mentioned in 58 and 62 is depicted below. It reflects work packages to be processed during the study in context of deliverables required. Review and approval phases are depicted in the third row of the schedule. Fourth row gives overview of expected presence meetings in Riga during the Study as well as two meetings organized by Contracting Authority after completion of the Study as described in 88. The number of participants from the Contractor's side is given for each meeting.



64. Communication under service contract (e.g. information, requests, submissions, formal notifications, etc.) must be carried out in English.

65. All written materials, including all deliverables, shall meet the highest standards of English language and technical terminology proficiency. if requested by the Contracting Authority, the Contractor shall engage professional proofreading services at its own expense.

66. Contracting authority has rights to publish the study final report in its website www.railbaltica.org.

3.2 SERVICE CONTRACT MANAGEMENT

3.2.1 Management structure and cooperation formats

67. The main decisions are made by the Contracting authority acting in agreement with and on behalf of the Ministry of Transport of Latvia and within Power of Attorney issued on 21 June 2019 by the Ministry of Transport. Decisions outside the scope of the Mandate are made by the Ministry of Transport of Latvia. Contracting Authority is responsible for regular reporting to Ministry of Transport regarding the progress of the Study.
68. Contracting Authority is main coordinator of the communication between the Contractor, stakeholders and other third parties. The Contractor shall be responsible for timely provision of information, preparation and participation in the meetings, workshops, presentations necessary for the communication with stakeholders and other third parties within Study's scope. No direct communication between the Contractor, stakeholders and other third parties is allowed without permission of Contracting authority.
69. In addition to settling operative and professional issues, the Contracting authority will establish a Technical Work Group (TWG), which will include the representatives of the Stakeholders. The TWG will be in charge of reviewing and commenting the Deliverables and will be invited to participate to the meetings. The Contractor shall provide Technical Work Group facilitation.

3.2.2 Provision of services

70. The Contractor must perform the Contract in compliance with its provisions and all legal obligations under applicable EU, international and national law within the set deadlines and to the highest professional, diligence and ethical standards.
71. The Contractor shall prepare detailed Study programme for its services to be provided during the Study. Study programme shall include graphical representation of main Study's milestones and deadlines of deliverables as required in Technical specification. Study programme shall cover possible risks for Study implementation and mitigation measures to avoid those risks in order to complete the Study on time. The purpose of Study programme is to reflect Contractor's deep understanding of Study's objectives, scope and milestones as well as to present Contractor's endeavour to cover all necessary subjects and provided high quality professional Consulting services on time.
72. The Contractor shall propose an optimum structure for the Project Team, based on the Services Requested in the terms of reference, and where possible propose a core team with cross-functional roles
73. For the provision of services, the Contractor shall remain fully responsible for the results of its services during and after the provision of services. Any additional expenses arisen due to the correction of the unacceptable results shall be covered solely by the Contractor. On reasonable grounds Contracting authority reserves the right to request the Contractor to correct the results of its services regardless whether it is necessary during the period of service provision or after completion of thereof.
74. All experts must be free from conflicts of interest in the tasks or responsibilities accorded to them.
75. The Contractor shall ensure necessary effort, means, resources and personnel required for the successful provision of services.
76. The Contractor shall be responsible for ensuring that its experts included in service contract are available throughout the service provision period.
77. The Contractor must keep records and other supporting documentation (original supporting documents) as evidence that the Contract is performed correctly, and the expenses were actually incurred. These must be available for review upon the request of Contracting authority.
78. The Contractor shall make its own arrangements for office facilities, personal computers and other facilities of appropriate performance and security standard for service provision.
79. The Contractor shall ensure that its team members (experts etc.) involved in service provision are adequately supported and equipped. In particular, the Contractor shall ensure that there is sufficient administrative, secretarial and interpreting provision to enable team members to concentrate on their

primary responsibilities. The Contractor must also transfer funds as necessary to support its activities under the Contract and ensure that his employees are paid regularly and in a timely manner. Costs for administration of service contract and office operation including telecommunication costs shall be included.

80. The Contractor will arrange for formal coordination and decision making on project interventions and establish an adequate internal management structure. Progress meetings with the Contracting authority shall be planned as presence meetings as described in Section 56 of this Technical specification. If needed, additional ad-hoc and weekly meetings can be arranged remotely, e.g. via skype, which may be initiated both by the Contractor, or the Contracting Authority.
81. The language for official communication is English. However, the Contractor shall provide translations of local meetings with stakeholders from/to local language.
82. Any official correspondence within the Contract must be done in paper.
83. The Contractor shall carry out the tasks, prepare and provide all documents, reports, minutes of the meetings and any other information material required for the provision of the services.
84. During the implementation of services, the Contractor shall identify possible risks at early stage and propose a mitigation measures in order to successfully deliver services on time.
85. As a part of services, the Contractor shall prepare information material in a fully comprehensive and understandable way, by providing explicit and full source details (initial information, evidences etc.) used for the analysis and provision of services. The deliverables shall include detailed explanation of methods employed that lead to the solutions delivered by the Contractor.
86. Contracting authority shall have no influence on outcome results (reports, summary, advice, decisions etc.) delivered by the Contractor. However, the Contractor shall consider Contracting authority's reasoned observations on the initial information used and analysis methods employed by the Contractor to provide outcome results of the services. The implementation of such observations is subject to the approval of the services by Contracting authority.
87. Together with the Final report delivery, the Contractor shall provide a separate Final completion report on Study implementation process of maximum 25 pages, covering the good practices to be shared and issues arisen that could be improved. The main topics to be covered in this report are as follows:
    - clarity and consistency of the tasks appointed to the Contractor;
    - communication and cooperation with the Client (local institutions, stakeholders etc.);
    - definition and deadlines for the milestones;
    - provision of input data;
    - issues encountered and recommendations for the improvement of Study implementation process;
    - other.
88. Upon a request by the Contracting Authority, the Contractor shall take part to maximum 2 (two) meetings, forums, discussions, etc. organised by the Contracting Authority or where the Contracting Authority shall take part during 1 (one) year after completion of the study. Such events are, for instance, Rail Baltica Task Force meetings, workgroups, meetings in the European Commission (Brussels), European Union Agency for Railways (Valenciennes), meetings with stakeholders in Latvia, Lithuania, Estonia, conferences, discussions, etc. When necessary, the Contractor shall prepare informative materials or work report presentations to be presented to these meetings.

3.2.3 Contractor's team

89. The Contractor shall propose an optimum structure for its team, based on the conditions of Technical specification, and where possible propose a core team with cross-functional roles.

90. For the provision of services, the Contractor shall ensure the availability of the following team members:

Key experts

No	Title
1.	Team leader, railway operation expert
2.	Railway infrastructure development expert
3.	Railway traffic simulation expert
4.	1520 mm signalling expert

91. The Contractor shall be responsible for the availability of any other additional experts, including administrative personnel, necessary for the provision of Consulting services.

3.2.4 Confidentiality, independence and absence of conflict of interest

92. The Contractor is expected to ensure that its contractual and professional obligations in particular with regard to confidentiality, independence and absence of conflict of interests are well understood and upheld throughout and after Services provision.

93. During the provision of services, the Contractor shall provide independent view based on its expertise, education and experience. The Contractor cannot show nor indicate any opinion linked to a particular supplier, company, organisation, institution whatsoever. No representation of any region, country, personal interests shall be shown by the Contractor throughout the service provision period.

3.2.5 Visibility Requirements

94. The Contractor is obliged to comply with the following visibility requirements:

95. Any reports, tables, figures and infographics, appendices, presentations and other deliverable material must be formatted according to Rail Baltica visual guidelines (http://railbaltica.org/about-rail-baltica/visual-guidelines/);

96. Any reports, brochures, other documents or information connected with Services which the Contractor produces and submits to the Principal, the Beneficiary, any other third person or makes publicly available must include the following:

(i) a funding statement stating that Services is the recipient of the funding from the CEF: "Rail Baltica is co-financed by the European Union's Connecting Europe Facility";

(ii) (for printed materials) a disclaimer releasing the European Union from any liability in terms of the content of the dissemination materials: "The sole responsibility of this publication lies with the author. The European Union is not responsible for any use that may be made of the information contained therein." This disclaimer in all European Union official languages can be seen at the website: https://ec.europa.eu/inea/connecting-europe-facility/cef-energy/beneficiaries-info-point/publicity-guidelines-logos;

(iii) the European Union flag.

97. Requirements set in Sections 96**Error! Reference source not found.** (i) and (iii) can be fulfilled by using the following logo:

If the Contractor shall use this logo, the Contractor shall ensure that elements of the logo will not be separated (the logo will be used as one whole unit) and enough free space around the logo shall be ensured;

98. The Contractor is obliged to comply with the latest visibility requirements set by the European Union. For that purpose the Contractor shall follow the changes in the visibility requirements on its own. On the date of conclusion of this Contract the visibility requirements are published on the following website: https://ec.europa.eu/inea/connecting-europe-facility/cef-energy/beneficiaries-info-point/publicity-guidelines-logos.