



Connectivity Networks Gap Analysis

Final Report

**IPA 2011-WBIF-Infrastructure Project Facility-Technical
Assistance 3**

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Kosovo * - "This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence"

Synopsis

The European Union has set aside up to €1 billion for connectivity investment projects in the Western Balkans and for technical assistance over the period of 2014-2020. In order to progress these investments DG NEAR has launched a gap analysis, as a sub-project under the IPF 3 contract, to identify the needs in terms of project preparation and overall investment to achieve the target connectivity. The geographic coverage of the Connectivity Gap Analysis is the six countries of the Western Balkans that are eligible for grants under the WBIF and the IPA programme. The analysis also covers the connectivity of the Western Balkans with neighbouring countries along the TEN-T and TEN-E networks.

The study started at the beginning of December 2015 and an inception report presenting the methodology was submitted in January 2016. The study has been conducted in two phases with a scoping phase undertaken during January and February 2016 to carry out the gap analysis of the transport and energy networks to identify actual physical gaps in the infrastructure networks. The main study phase has taken place during March and April 2016 and involved meetings with the relevant authorities in each country and reviews of available documentation in order to assess the level of project preparedness for construction for each of the identified gaps.

The analysis for the transport networks produced an inventory of the gaps for the the Mediterranean, Orient/East Med and Rhine/Danube core corridors. The gaps have been identified in relation to the TEN-T standard required for each of the road network, the rail network and the ports/inland waterway system. The compliance with each of these criteria has been shown graphically on maps using the GIS application developed. Each of these projects has been reviewed and a project fiche produced which summarises the available project documentation.

The analysis for the energy networks has used the ECS PEI 2016 submissions received in February 2016 as the basis for the study phase. The electricity projects are aligned along corridors which include the Trans Balkan North-South Corridor; the Mid Continental East Corridor; the WB6 Southern Loop and the new interconnection between Croatia and Bosnia and Herzegovina. The review of the gas sector has been different in nature as only three of the countries (Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia and Serbia) presently benefit from gas supplies and the nature of the planned investments is very dependent on commercial decisions relating to major pipelines. Most of the gas projects are also at a very early stage of development.

In summary the number of projects recommended as mature for co-financing are as follows:

Sector	Projects reviewed	Mature for co-financing	Average investment per mature project
Road	29	8	€290 million
Rail	23	4	€300 million
Inland Waterways	6	3	€14 million
Electricity	14	4	€30 million
Gas	19	0	-

List of Abbreviations

Abbreviation	Meaning
ALB	Albania
BiH	Bosnia and Herzegovina
CA	Contracting Authority
CD	Completed designs
CEB	Council of Europe Development Bank
CEF	Connecting Europe Facility
CESEC	Central and South Eastern Europe Gas Connectivity project
CM	Country Manager
CNG	National Gas Station
CO	Country Office
CoE	Council of Europe
DG NEAR	Directorate-General for Neighbourhood and Enlargement Negotiations
DTL	Deputy Team Leader
EBRD	European Bank for Reconstruction and Development
EC	European Commission
ECS	Energy Community Secretariat
EIB	European Investment Bank
EnC	Energy Community
ENE	Energy sector
ENER	Directorate General for Energy
ENTSO	European Network of Transmission System Operators for Electricity ENTSO-e: electricity and ENTSO-g: gas
ERTSM	European Rail Traffic Management Systems
ESW CBA	Energy System Wide Cost Benefit Analysis
EU	European Union
EUD	European Union Delegation
EWBJF	European Western Balkans Joint Fund
FBiH	Federation of Bosnia and Herzegovina, entity of Bosnia and Herzegovina
FS	Feasibility study
HPP	Hydro Power Project
HR	Croatia
IA	Implementing Agency
IAP	Ionian Adriatic Pipeline
IFI	International Financing Institution
IPA	Instrument for Pre-accession
INV	Investment
ITS	Intelligent Transport Systems
GIS	Geographic Information System
IWW	Inland Water Ways
GRIP	Southern Corridor Gas Regional Investment Plan

Abbreviation	Meaning
IPF	Infrastructure Project Facility
IPF1	Infrastructure Project Facility -Technical Assistance Window, 1st contract
IPF2	Infrastructure Project Facility -Technical Assistance Window, 2nd contract
IPF3	Infrastructure Project Facility -Technical Assistance Window, 3rd (current) contract
IPF4	Infrastructure Project Facility -Technical Assistance Window, 4th (current) contract
IR	Inception Report
IW	Implementation Works
JGF	Joint Grant Fund
JNKE	Junior Non Key Expert
KfW	Kreditanstalt für Wiederaufbau
KOS	Kosovo*
MKD	the former Yugoslav Republic of Macedonia
MIS	WBIF Management Information System
MNE/MON	Montenegro
MoEI	Ministry of European Integration
Mott MacDonald-IPF Consortium	The Consortium carrying out the present project
NIPAC	National IPA Coordinator
NKE	Non-Key Expert
NSI	North-South electricity interconnections in Central, Eastern and South Eastern Europe
Pd	Person day(s)
PECI	Projects of Energy Community Interest
PCI	Projects of Community Interest
PFS	Pre-feasibility study
PGAF	Project Grant Application Form (formerly PDF)
PPF	Project Preparation Facility
PSS	Project Specific Step
RS	Republic of Srpska, entity of Bosnia and Herzegovina
SC	Steering Committee
SE6	South East Europe 6 (Albania, Bosnia Herzegovina, Kosovo, the former Yugoslav Republic of Macedonia, Montenegro, Serbia) – also known as WB6
SEETO	South East Europe Transport Observatory
SEE	South East Europe
SER	Serbia
SGC	Southern Gas Corridor
SNKE	Senior Non Key Expert
SoW	Supervision of Works
SPM	Senior – Project Manager
SRB/SER	Serbia
TA	Technical Assistance
TAP	Trans Adriatic Pipeline
TEN-E	Trans-European Energy Network
TEN-T	Trans-European Transport Network
TL	Team Leader
TM	Task Manager

Abbreviation	Meaning
ToR	Terms of Reference
TP	Preparation work for the tender process
TRA	Transport sector
TSO	Transmission System Operator
TYNDP	Ten Year Network Development Plans
WB6	Western Balkans 6 (Albania, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Kosovo, Montenegro and Serbia)
WB (G)	World Bank (Group)
WBIF	Western Balkans Investment framework

1. Introduction

1.1 Background

In April 2015 the WB6 agreed on core transport networks in line with EU recommendations and priority energy projects were identified based on the work of the Energy Community Secretariat. The European Union has set aside up to €1 billion for connectivity investment projects in the Western Balkans region and for technical assistance over the period of 2014-2020. In order to progress these investments DG NEAR launched a gap analysis to identify the needs in terms of project preparation and overall investment to achieve the target connectivity. IPF3 was requested by DG NEAR to undertake the Connectivity Gap Analysis under the Advisory Services component of the IPF3 contract.

1.2 Study objectives and framework

The geographic coverage of the Connectivity Gap Analysis is the six countries of the Western Balkans that are eligible for grants under the WBIF, and the IPA programme. The Analysis also covers the connectivity of the Western Balkans with neighbouring countries along the TEN-T and TEN-E networks. The strategic objectives of the study are:

1. To identify the physical infrastructure gaps in the connectivity networks – Energy and Transport – and define the segments of infrastructure required to close the gaps.
2. To review the present status of project identification, planning and preparation for each identified gap and assess the maturity of project implementation to fill each gap.
3. To identify the programme timeline, activities and budget for each gap project to move the status from project preparation to project implementation.
4. To prepare an overall prioritised programme of network segments, with identified project preparation and other actions, required to allow construction activities to commence.

The study began in December 2015 with a start up meeting held in Brussels with DG NEAR on 9 December. An inception report was submitted in the first week of January which defined the methodology for the study. This defined two phases to the study as follows:

- A Scoping Phase to be undertaken during January and February 2016 to provide the overview of the Transport and Energy Networks in each country, identify gaps in the networks and the specific segments (projects) already identified, planned, under preparation or about to enter the construction phase. This was agreed to be a desk top exercise based on existing documentation but to include visits to SEETO and the Energy Community Secretariat. The report was presented in mid February.
- A Study Phase to be undertaken in March and April during which meetings with the relevant authorities in each country would be held and detailed studies and reviews of documentation carried out together with an assessment as to project preparedness for construction for each of the identified segments. The present report presents the results of this phase.

1.3 Outcome of the scoping phase

The scoping phase consisted of: a gap analysis of the electricity, gas, road, rail and ports/inland waterways networks; meetings with the South East Europe Transport Observatory (SEETO) and the Energy Community Secretariat (ECS); and development of a Geographic Information System application to assist in the presentation of the network maps and storage of information.

The gap analysis for the transport networks carried out an inventory of the gaps for the entire SEETO core network and then refined it to include only those projects on the three TEN-T core corridors extended across the Western Balkans, namely the Mediterranean corridor, the Orient/ East-Mediterranean corridor and the Rhine/Danube corridor. The gaps were identified in relation to the TEN-T standard required for each of the road network, the rail network and the ports/inland waterway system. The compliance with each of these criteria was shown graphically on maps using the GIS application developed. A total number of 90 gaps were identified for the Transport Sector across the entire WB6 core network comprising 53 road projects, 31 rail projects and 6 ports/inland water way projects.

The gap analysis for the energy networks produced an inventory of the projects identified under the various energy project initiatives. A total of some 68 projects were identified for the Energy Sector of which 29 were electricity and 39 gas. This work was undertaken at the same time that submissions were being prepared for the ECS PECEI 2016 list and applications closed slightly after the submission of the report. DG NEAR concluded that the PECEI 2016 draft list should constitute the definitive shortlist for the study phase.

1.4 Activities undertaken during the study phase

The activities undertaken during the study phase have been:

- Visits to each of the WB6 countries by the sub-project manager to liaise with each NIPAC and EUD, brief them on the projects identified in their country, and request their support in facilitating access to the project documentation held by their beneficiaries.
- Mobilisation of a team of experts to visit each of the WB6 countries and review the documentation available for each of the gap projects identified in the transport and energy sectors. This involved inputs from 5 experts in the energy sector, 8 in the transport sector, 2 cross cutting environment experts and 6 WBIF country managers. This work was carried out using a standard data template (fiche) which had been presented in the scoping report.
- Further development of the Geographic Information System application (GIS) in order to: present the transport Core Corridors; design a system to measure the progress towards meeting the TEN-T transport standards (barometer); incorporate the projects identified in the gap analysis for each network; transfer the data collected in the project fiches to the data base and allow this to be interrogated easily by users.
- Analysis of the status of each project and development of the present report

1.5 Geographic Information System application

An important activity during the scoping and study phases has been the development of a GIS application which will assist in the presentation of the results of the study and also provide a single home for all the data. Such a tool will be extremely useful in allowing multiple users to view and access the connectivity information and will assist in the regular updating of the connectivity status quo whenever this should be needed. The ESRI ArcGIS platform has been used as the GIS platform for the system with spatial data stored in a relational database management system (RDBMS). LOCALIS Visios web GIS viewer is used

for the provision of web services i.e. data sent using web services. End users are able to search, identify and visualize geographic data, make graphic reports and/or edit geometry and attribute data using this application. This web-oriented system enables access to data for an unlimited number of users.

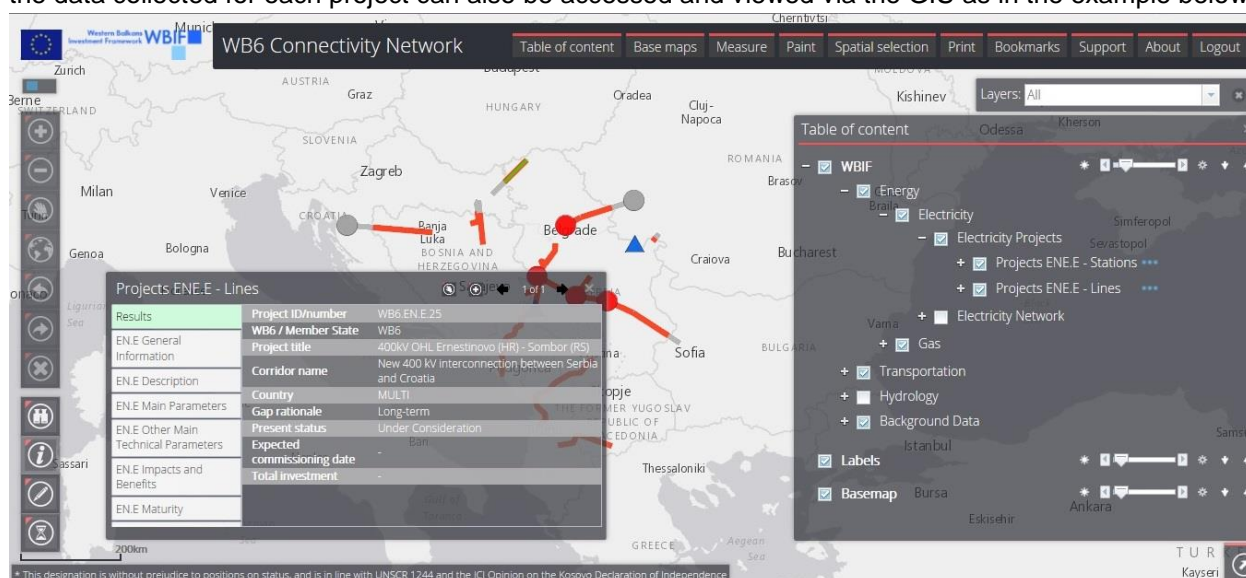
It should be noted that this approach has been possible thanks to the excellent cooperation established with SEETO for which the study team are extremely grateful. SEETO has allowed use of the data held in their data base SEETIS which forms the platform for the GIS application. For transport the proposal is that the application would be transferred to SEETO at the end of the study thus providing a stable institutional home for the data and information. This transfer of transport and energy data would take place once the SEETO system is upgraded later in 2016. For energy, a more permanent home for the system will need to be established, possibly at ECS in Vienna.

1.6 Report structure

This final report has been structured such that a separate chapter is devoted to each network and to provide within that chapter an overview of the work undertaken during both the scoping and study phases. The chapters are as follows:

- Chapter 2 Roads
- Chapter 3 Rail
- Chapter 4 Inland waterways
- Chapter 5 Electricity
- Chapter 6 Gas
- Chapter 7 Conclusions

Each chapter presents a summary of the gap analysis undertaken for that network, a review of the maturity of the shortlisted projects and an overview of the projects identified to be mature for co-financing. The building blocks have been the fiches produced for each of the projects which present the current snap shot of the status of the project. These fiches are available in a Project Appendix and are also stored within the GIS. The way in which these can be read via the GIS is shown on the attached map where one particular project has been “clicked” thus bringing up a menu of tabs that allows the user to scroll through the fiche for that project. Each network, the projects identified from the gap analysis and the data collected for each project can also be accessed and viewed via the GIS as in the example below.



The screenshot displays the 'WB6 Connectivity Network' GIS interface. A map shows the network across Central Europe, with a specific project highlighted in red. A 'Projects ENE.E - Lines' fiche is open, showing details for project WB6.ENE.25. A 'Table of content' panel is also visible, listing various layers like Energy, Electricity, and Gas.

Projects ENE.E - Lines	
Results	Project ID/number WB6.ENE.25
EN.E General Information	WB6 / Member State WB6
EN.E Description	Project title 400kV OHL Ernestinovo (HR) - Sombor (RS)
EN.E Main Parameters	Corridor name New 400 kV interconnection between Serbia and Croatia
EN.E Other Main Technical Parameters	Country MULTI
EN.E Impacts and Benefits	Gap rationale Long-term
EN.E Maturity	Present status Under Consideration
	Expected commissioning date
	Total investment

2. Road network

2.1 Gap analysis

Within the framework of the initial Scoping Phase of the present Study, a compliance gap analysis of the entire Western Balkans (WB) Core Network against the TEN-T standards was undertaken. More specifically, the methodology used for analysing the WB Core Network in terms of its compliance with the TEN-T standards, based on the criteria set out in the TEN-T regulation No. 1315/2013, followed a simple yet rigorous approach. The main methodological steps were:

- Identification of the segments of the road network that could potentially satisfy the TEN-T criteria for core network including review of the sector pipelines developed by the National Investment Committees of the six countries.
- Comparison of the road transport infrastructure technical parameters of these identified segments of the road network on a country basis against requirements set out in TEN-T Regulation No 1315/2013.
- Overview of current state of play regarding: (i) the extent of the road transport infrastructure requirements, already met per each country, and (ii) the road infrastructure projects already identified (projects planned, under preparation or about to enter the construction phase). Finalisation of the segments of the road network that satisfy the TEN-T criteria for core network, together with related missing links/gaps.”

Within the second phase of the study (“Study Phase”), the gap analysis’ was limited to the extension of the three TEN-T Core Corridors that intersect the region namely the Orient-East Med (OEM) Corridor, the Mediterranean (MED) Corridor and the Rhine-Danube Corridor. No definitive mapping of these corridors could be found and the consultants proposed the following network using guidance from DG MOVE:

- OEM Corridor – Road Network (*Total length approx. 1,585 km*):
 - Section: Budapest – **Horgos/Subotica – Belgrade – Nis – Skopje – Gevgelija/Evzoni** – Thessaloniki
 - Section: **Nis – Pristina – Skopje**
 - Section: **Belgrade – Podgorica - Bar**
- MED Corridor – Road Network (*Total length approx. 936 km*):
 - Section: Zagreb – **Batrovci – Belgrade**
 - Section: Rijeka – Ploce – **Neum Northwest – Neum Southeast – Debeli Brijeg – Bar – Tirana – Durres** – Igoumenitsa
 - Section: **Bosanski Samac – Sarajevo – Doljani** – Ploce

In the following map, the proposed alignment for the road network is presented. It is noted that the proposed alignment is entirely based on the Core Transport Network for the Western Balkans region, as agreed in 2015 (some gaps in the map on the MED Corridor represent sections that are in Croatia and therefore not part of the WB6). The Core Network for the region is based on the Comprehensive network, established under MoU, as well as the SEETO and TEN-T methodology for the definition of the TEN-T Core Network. Data on these road links are collected and maintained by SEETO Secretariat (SEETIS database). The present gap analysis used the most recent available data included in the SEETIS database (2014).

Figure 2.1 The Core Corridors proposed alignment for the Road Network



Based on the compliance exercise which was performed, it seems that only 27% of the OEM Corridor is compliant, whereas regarding the MED Corridor, the compliance percentage for the road network is approximately 35%.

It should be noted that based on the TEN-T standards, as identified in the TEN-T regulation No. 1315/2013, the TEN-T requirements for the road network are:

- Roads have to be either an express road or a motorway by 2030
- Roads must have sufficient parking areas, at least every 100 km, by 2030
- Availability of alternative clean fuels by 2030
- Use of tolling systems/ITS and their interoperability with other systems

Within the framework of the present analysis, in order for a road section to be compliant, it had to be of motorway standard and also be in very good (IRI 0-1.24) or good condition (IRI 1.24-2.84). This effectively meant that certain sections of the road network which are of motorway standard, but not

properly maintained or in need of immediate rehabilitation, have been treated as non-compliant links. Furthermore, for the compliant motorway sections, it is assumed that there are available parking areas, while the criteria referring to the availability of alternative fuels and ITS/tolling systems were not examined, as they are not directly related to primary infrastructure characteristics.

The identified infrastructural compliance gaps for the road network are presented in the following Figure and the respective Table.

Figure 2.2 The Compliance Gaps for the Core Corridors - Road Network (2014)

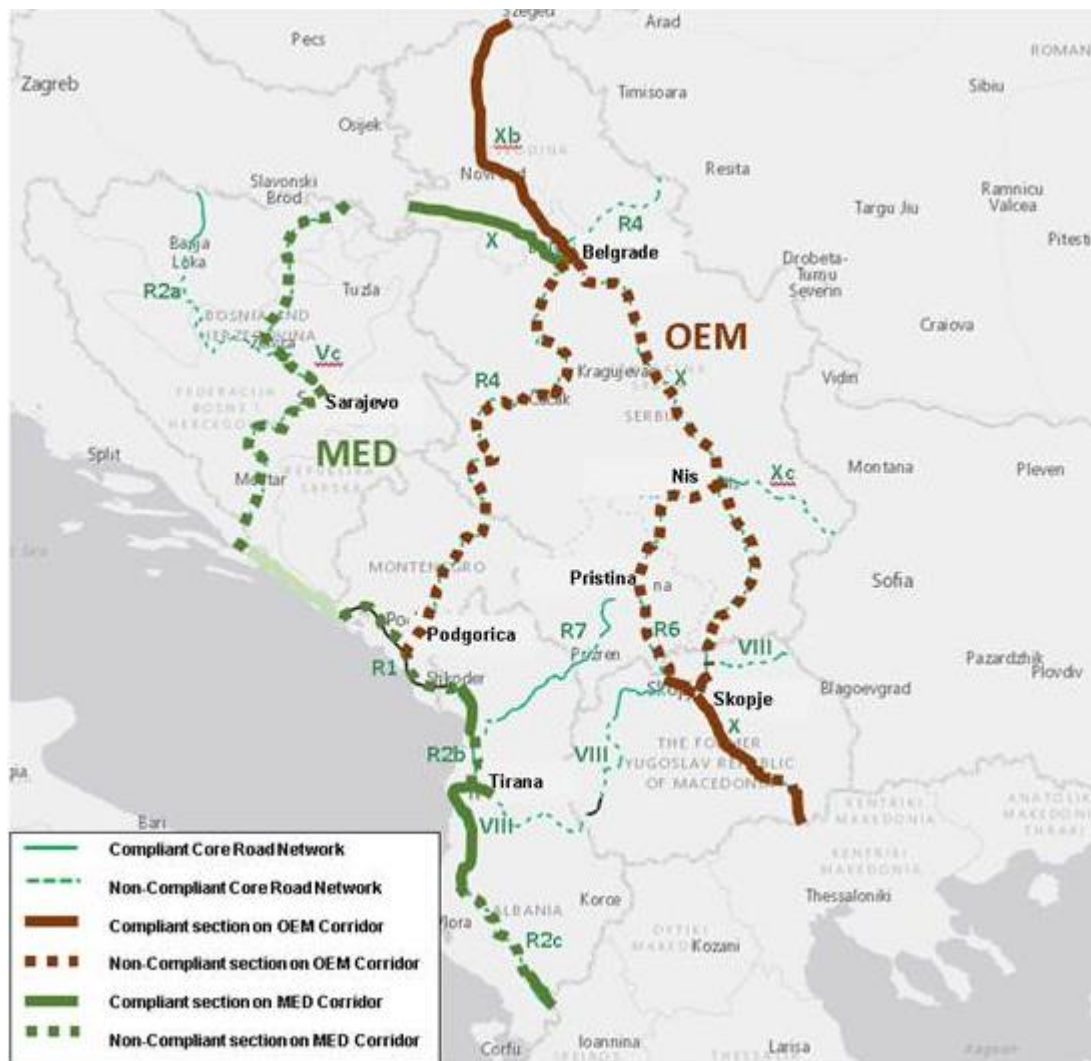


Table 2.1 Compliance Rates for the Core Corridors – Road Network (2014)

	OEM Corridor		MED Corridor	
	Km	%	km	%
Compliant road sections	437	27.42	323	34.51
Non-compliant motorways	329	20.64	0	0.00
Non-compliant 2-lane roads	828	51.94	613	65.49
Total Length	1594		936	

Note: *Compliant road sections – motorways in very good (IRI 0-1.24) or good condition (IRI 1.24-2.84)*
Non-compliant motorways – motorways in medium or poor condition (IRI > 2.84) in need of rehabilitation
Non-compliant 2-lane roads – national roads with 1 lane per direction in need of reconstruction or the construction of a new motorway

It is noted that for the estimation of the compliance rates for the Mediterranean Corridor, the alignment of the planned Adriatic – Ionian Highway in Montenegro and Albania (Debeli Brijeg – Sotonici – Bar – Muriqan – Buna Bridge) was taken into consideration, rather than the existing road segments. This alignment will eventually be part of the WB Core Network and the Mediterranean Core Corridor.

For the identified infrastructural compliance gaps, all necessary projects in order for the existing infrastructure to meet with the TEN-T standards, have been listed and thoroughly analysed. The main aim has been to draw reliable conclusions in terms of their maturity level and to have a clear picture of their implementation timeframe. The ultimate goal is for the two Core Corridors to become fully compliant thus enhancing connectivity with the WB region, as well as between the WB region and the EU Member States. It should be noted that the compliance check exercise was based on the most recent SEETO Secretariat data (2014). However, since then, works for the construction of new motorways on some road sections were completed (e.g. sections on Corridor Vc). For these road sections, no projects were identified/analysed.

An overview of the identified projects are presented in the following sections. Precise map locations of “mature” projects are provided in the project summaries in Section 2.3.

2.2 Review of Projects

2.2.1 Orient-East Med (OEM) Corridor

For the road sections of the OEM Corridor, 17 projects in total were identified during the scoping phase, also taking into account the National Single Project Pipelines (SPPs) and the SEETO Multi-Annual Plan (MAP) 2016. Furthermore, it is noted that for the OEM Corridor, the road section between Kumanovo and Deve Bair (Border with Bulgaria) in the former Yugoslav Republic of Macedonia is also considered, since a project for the road segment Rakovce – Kriva Palanka – Deve Bair was included in the list of pre-identified projects for the OEM Corridor in the Connectivity Agenda (Western Balkans Summit – Vienna 2015). This road section is part of Corridor VIII and consists of a significant link with Bulgaria. Currently, the road segment Kumanovo – Deve Bair is not compliant with the TEN-T standards, as it is a two lane national road. Thus, in total for OEM Corridor **18 projects** were examined, an overview of which is presented in the following Table.

Table 2.1.2 Identified Investment Projects on OEM Corridor – Road Network

	Project	Country	TEN-T Standard to be met	Investment Cost (million €)	Status	Maturity Level
1	Reconstruction of road section between Ostruznica and Strazevica (Sectors 4 and 5) in Serbia to meet with motorways TEN-T standard	SER	Motorway in good condition	60	PFS, FS, PD, ESIA, Spatial Planning are completed, Land property issues are resolved, DD is ongoing	High
2	Completion of Belgrade bypass, Sector 6: Strazevica-Bubanj Potok	SER	Motorway in good condition	143	PFS, FS, ESIA, Spatial Planning are completed, DD, land property issues, construction and other permits are ongoing	High
3	Rehabilitation of the road section between Bubanj Potok and Grdelica in Serbia to meet with motorways TEN-T standard	SER	Rehabilitation of the existing motorway to be in good condition		This project is a maintenance project that is financed by national funds for road maintenance – This project is not eligible for co-financing	
4	Reconstruction of road section between Grdelica and Presevo in Serbia to meet with motorways TEN-T standard	SER	Motorway in good condition	NA	The project is considered fully prepared and no further preparation activities are envisaged. Construction works are ongoing.	No need for co-financing
5	Reconstruction of road section between Demir Kapija and Udovo to meet with motorways TEN-T standard	MKD	Motorway in good condition	NA	Construction works are ongoing.	No need for co-financing
6	Rehabilitation of the road section between Kumanovo and Miladinovci in MKD to meet with motorways TEN-T standard	MKD	Rehabilitation of the existing motorway to be in good condition	NA	Construction works are ongoing.	No need for co-financing

Project	Country	TEN-T Standard to be met	Investment Cost (million €)	Status	Maturity Level	
7	Reconstruction of the road section Pozega-Belgrade to meet with motorways TEN-T standards	SER	Motorway in good condition	1,100	PFS, FS, PD and ESIA are completed, Spatial planning documents are completed, Land property issues, DD, Tender documentation, construction and other permits are ongoing. Section from Obrenovac to Preljina is under construction	High (Note: the sub section Obrenovac-Preljina is already under construction)
8	Pozega-Boljare road (border with Montenegro)	SER	Motorway in good condition	1,900	PFS completed, Spatial planning documents are ongoing	Low
9	Route 4: Highway Bar-Boljare, section Andrijevica - Boljare	MNE	Motorway in good condition	NA	PFS completed, Spatial planning documents are ongoing	Low
10	Completion of Road Route 4, section Matesevo-Andrijevica	MNE	Motorway in good condition	295	PFS completed, Spatial planning documents are ongoing	Medium
11	Route 4: Matesevo - Podgorica - reconstruction	MNE	Motorway in good condition	810 (Financing secured)	PFS, FS, PD, ESIA are completed, Spatial planning documents are completed, land property issues are resolved, DD, Construction and other permits are ongoing.	No need for co-financing
12	Construction of bypass Podgorica (Capital-Smokovac-Farmac)	MNE	Motorway in good condition	233	PFS completed, Spatial planning documents are ongoing	Medium
13	Route 4: Highway Bar-Boljare, section Djurmani - Farmaci	MNE	Motorway in good condition	NA	PFS completed, Spatial planning documents and land property issues are ongoing	Low
14	Construction of road section Skopje - Kosovo border	MKD	Motorway in good condition	131	PFS, FS, PD, ESIA are completed, DD is ongoing	Medium

Project	Country	TEN-T Standard to be met	Investment Cost (million €)	Status	Maturity Level	
15	Construction of the road section Pristina – Border with the former Yugoslav Republic of Macedonia	KOS	Motorway in good condition	660	Under construction	No need for co-financing
16	Construction section Pristina-Merdare	KOS	Motorway in good condition	150	PFS, FS and ESIA are ongoing	Medium (Note: this project is of high political and regional importance)
17	Construction of highway section Merdare-Kursumlija -Prokuplje bypass - Merosina - Nis	SER	Motorway in good condition	512 (732for full motorway profile)	PFS is completed, FS, PD, ESIA, Spatial Planning are ongoing	Medium (Note: this project is of high political and regional importance)
19	Reconstruction of road section from Rankovce to Kriva Palanka	MKD	Motorway in good condition	78	PFS, FS, PD, ESIA, DD are completed, Land property issues, Tender Documentation, Construction and other permits are ongoing	High
Total				4,531		

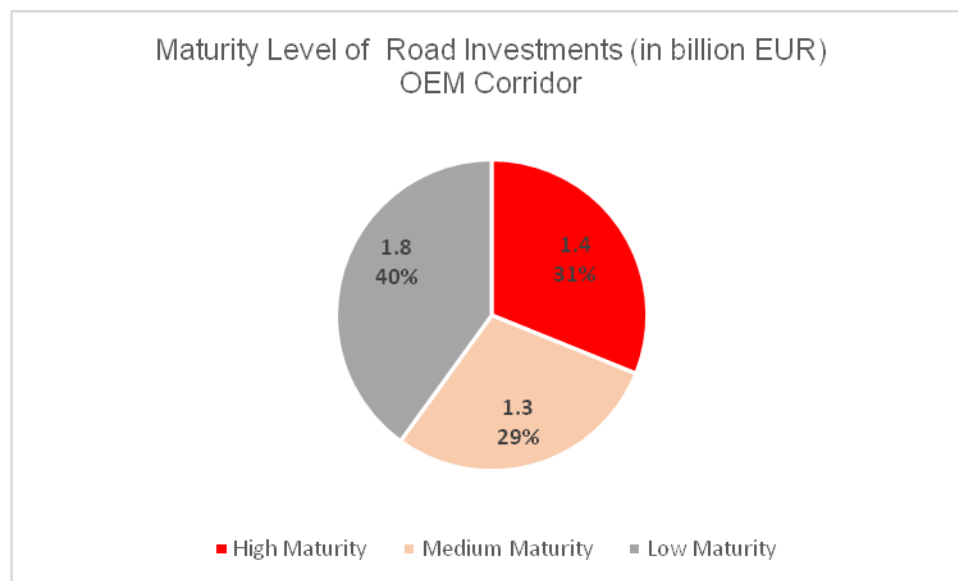
Note: PFS – Prefeasibility Study
 FS - Feasibility Study
 PD -Preliminary Design
 DD -Detail Design
 ESIA - Environmental and Social Impact Assessment

The total investment cost for the identified road projects, excluding the ones for which financing is secured, is estimated to be approximately €4.50 billion. In the following Figure, the investment costs per maturity level for the identified projects are presented. It should be noted that regarding the maturity level of the projects, the following assumptions were made:

1. High maturity projects: projects on which construction is likely to start by 2020
2. Medium maturity projects: projects likely to start construction near 2020, but with high risks for delays
3. Low maturity projects: projects that will be constructed after 2020

For the road projects of high maturity (projects on which construction is likely to start before 2020), a more detailed analysis is presented in Chapter 2.3, while all detailed information for all identified projects can be found in the Project Appendix, where all the Project Fiches are presented.

Figure 2.3 Maturity level of road projects in the MED Corridor



2.2.2 Mediterranean (MED) Corridor

For the Mediterranean Corridor, the main infrastructural limitations are concentrated on Corridor Vc in BiH, as well as the coastal road sections along Montenegro and Albania, where the Adriatic-Ionian Highway is planned. More specifically, **11 investments** in road infrastructure were identified for the MED Corridor which are listed in the following Table.

Table 2.2.2 Investment Projects on MED Corridor – Road Network

	Project	Country	TEN-T Standard to be met	Investment Cost (million €)	Status	Maturity Level
1	Construction of the motorway section Odzak-Vukosavlje-Podnovlje-Rudanka-Doboj South	BIH	Motorway in good condition	367	PFS, FS, PD, ESIA, Spatial Planning, DD are completed, Construction and other permits are ongoing	High
2	Construction of the motorway section Odzak-Svilaj, border crossing and cross border bridge Svilaj over Sava River	BIH	Motorway in good condition	93	The project is considered fully prepared and no further preparation activities are envisaged. Construction works are ongoing.	No need for co-financing
3	Completion of motorway section Tarcin-Konjic	BIH	Motorway in good condition	769	PFS is completed, FS, PD, ESIA, Spatial Planning, Land property issues, DD are ongoing.	Medium

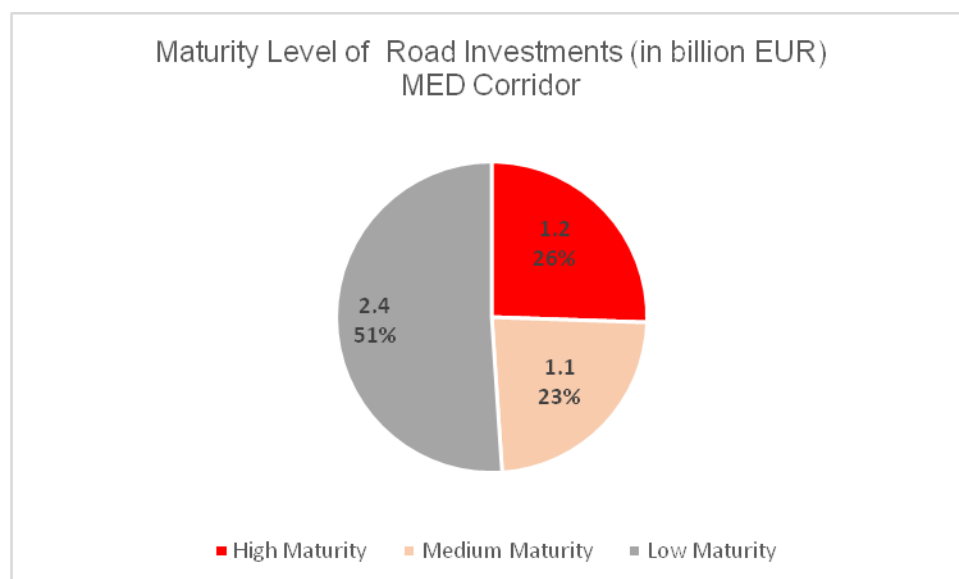
	Project	Country	TEN-T Standard to be met	Investment Cost (million €)	Status	Maturity Level
4	Completion of motorway section Mostar Sjever-Pocitelj	BIH	Motorway in good condition	336	PFS completed, FS, PD, ESIA and DD are ongoing	Medium
5	Construction of the motorway section Zenica North-Žepče South	BIH	Motorway in good condition	357	PFS, FS, PD, ESIA, Spatial Planning are completed, DD, Land property issues, Tender Documentation, Construction and other permits are ongoing	High
6	Construction of the motorway section Žepče South – Doboj South	BIH	Motorway in good condition	405	PFS, FS, PD, ESIA, Spatial Planning are completed	Medium (Note: one sub section is already under construction)
7	Construction of the motorway section Konjic – Mostar North	BIH	Motorway in good condition	1,722	PFS, PD are completed, FS and Spatial planning are ongoing	Low
8	Adriatic-Ionian Motorway/Expressway (Section in Montenegro)	MNE	Motorway in good condition	698	No available documentation yet	Low
9	Adriatic-Ionian Motorway/Expressway (Section in Albania)	ALB	Motorway in good condition		No available documentation yet	Low
10	Upgrade of Thumane-Vore-Kashar (part of the Adriatic-Ionian Highway)	ALB	Motorway in good condition	97	FS and PD are completed, DD is ongoing (completion July 2016)	High
11	Construction of Tirana bypass (part of the Adriatic-Ionian Highway)	ALB	Motorway in good condition	110	FS, PD, ESIA are completed, Spatial Planning, Land property issues, DD, Tender documentation, Construction and other permits are ongoing	High
	Total			4,765		

Note: FS - Feasibility Study
 PD -Preliminary Design
 DD -Detail Design
 ESIA - Environmental and Social Impact Assessment

It is noted that the Adriatic-Ionian Highway project in particular, is in preparatory stage and no studies are yet available. The Feasibility Study of the entire Highway will be part of the next WBIF – IPF project. However, several parts along the highway have been separately examined and have different maturity levels, as seen in the previous Table. These sections are the Thumane – Vore – Kashar road section and the Tirana Bypass, all of which will eventually be part of the Adriatic – Ionian Highway and the work that has already been undertaken for these sections consists of significant input for the entire Highway’s planning process.

The total investment cost for the identified road projects, excluding the ones for which financing is secured, is estimated to be approximately €4.80 billion. In the following Figure, the investment costs per maturity level of the identified projects are presented. For the road projects of high maturity (projects likely to be implemented before 2020), a more detailed analysis is presented in Chapter 2.3, while all detailed information for all identified projects can be found in Project Appendix, where all the Project Fiches are presented.

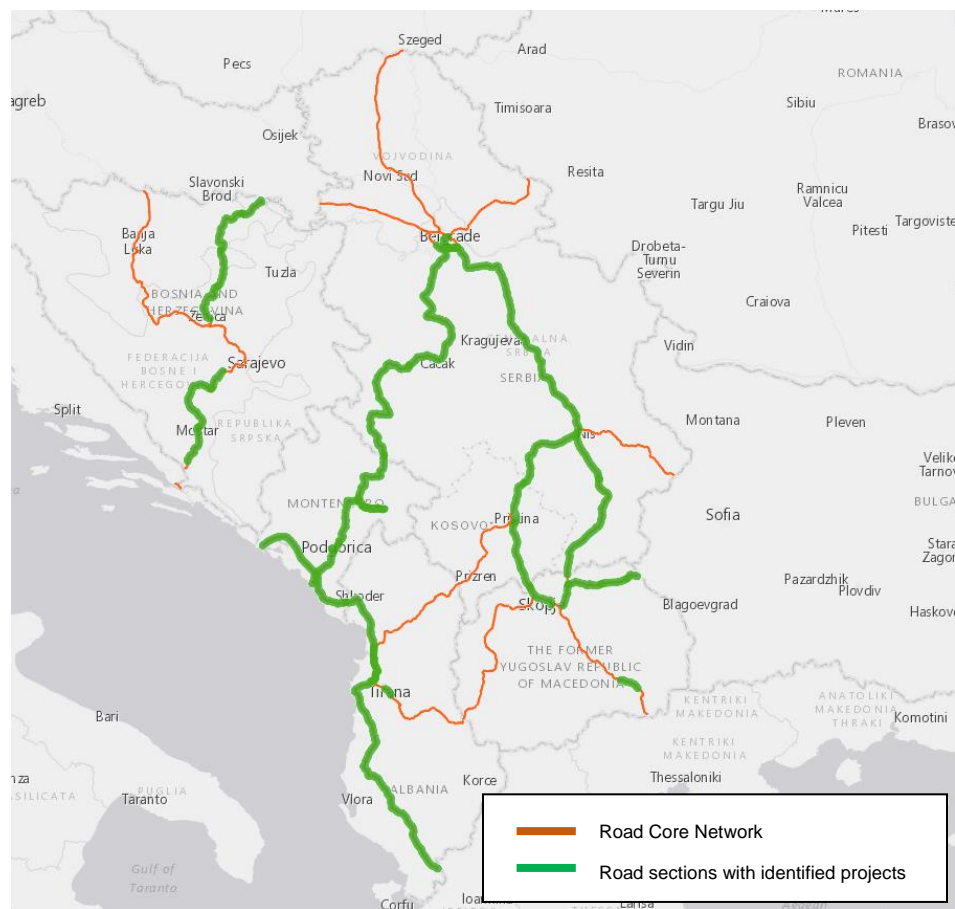
Figure 2.4 Maturity level of road projects on the MED Corridor



2.3 Overview of mature projects

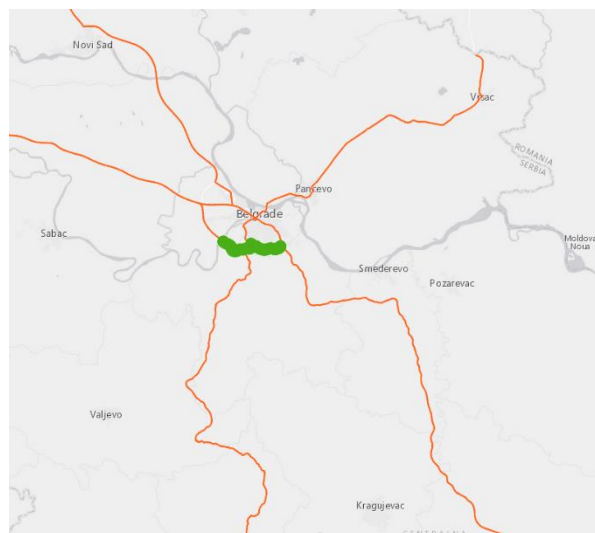
For both OEM and MED Corridors, 29 projects were identified in total.

Figure 2.5 Identified Road projects



Based on the analysis undertaken during the Study Phase, in close collaboration with all involved Beneficiaries and Stakeholders, 8 out of these 29 road projects that were analysed, were found to be of high maturity and most likely implemented before 2020. A brief overview of these projects is presented as follows.

2.3.1 Reconstruction of road section between Ostruznica and Strazevica (Sectors 4 and 5) in Serbia to meet with motorways TEN-T standard



Type: Road project
From/To: Ostruznica to Bujanj Potok
Core Corridor: OEM
Country: Serbia
Costs: €60 million

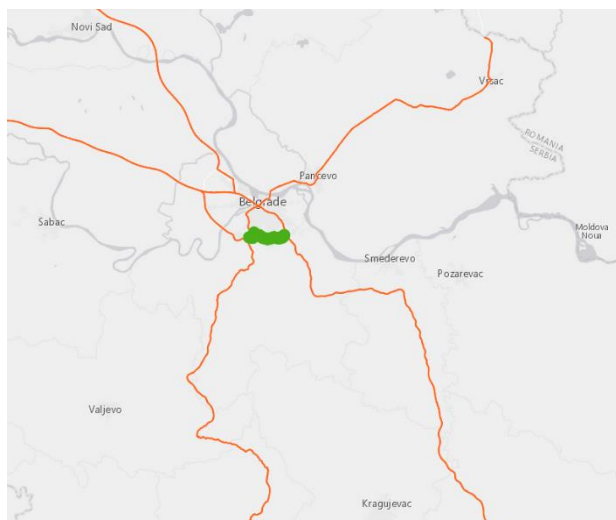
Project status: The project is advanced in terms of preparation. Main designs were prepared in 2011 (Sector 5, Orlovaca Interchange-Strazevica) and December 2012 (Orlovaca Interchange, Sector 4) and revised by the State Revision Committee. However, these designs needed to be updated as per the latest changes in the national legislation. While preparation of the technical documentation is now completed for Sector 4 (Ostruznica-Orlovaca Interchange), the Design for Construction Permit and Detailed Design for Sector 5 (Orlovaca Interchange - Strazevica tunnel) are still outstanding.

Project benefits: The construction of Belgrade Bypass motorway between Batajnica and Bujanj Potok (Sector 6 is also included) is expected to enhance transit transport activities, both passenger and freight, significantly reduce travel times, increase LOS and road safety. Belgrade will benefit in lowering traffic congestion on street network, in lowering traffic noise and in environmental improvement.

Project financing: As per the main designs prepared, estimated investment cost for the subsection Orlovaca Interchange-Strazevica is €8.15 million while estimated investment cost for the Orlovaca Interchange alone is approx. €5 million. Funding is not yet defined. However, ongoing negotiations with the Azerbaijani company Azvirt LLC include potential borrowing from the republic of Azerbaijan.

Project associated risks: Delays in completing the remaining technical documentation (designs for construction permit and detail designs for structures); Financing problems due to limited borrowing capacity.

2.3.2 Completion of Belgrade bypass, Sector 6: Strazevica-Bubanj Potok



Type: Road project
From/To: Strazevica to Bubanj Potok
Core Corridor: OEM
Country: Serbia
Costs: €143 million

Project status: The feasibility study is provided for the entire Belgrade Bypass. Preparation of the project underway altogether with the further section C Bubanj Potok-Vinca Bridge-Pancevo (in particular, the Bubanj Potok Interchange). Although all spatial and technical design documentation are completed, land acquisition is still outstanding. However, it is noted that the main design documentation already prepared in 2013 is to be adjusted to meet the latest (changed) Serbian legislation (requirement for obtaining Construction Permit) and therefore further technical documentation preparation activities are required (instead of the Main Design, these adjustments require preparation of Design for Construction Permit and Detailed Design, of which the later one required for tendering/works).

Project benefits: The construction of Belgrade Bypass motorway between Batajnica and Bubanj Potok is expected to enhance transit transport activities, both passenger and freight, reduce significantly travel times, increase LOS and road safety. Belgrade will benefit in lowering traffic congestion on street network, in lowering traffic noise and in environmental improvement.

Project financing: Funding is not yet defined. However, ongoing negotiations with the Azerbaijani company Azvirt LLC include potential borrowing from the republic of Azerbaijan.

Project associated risks: Potential expropriation issues; potential implementation delay or unsynchronised implementation of the interchange Bubanj Potok, which foreseen to be implemented and technically harmonised within the Section C (Bubanj Potok-Vinca bridge-Pancevo, which being part of the Belgrade-Pancevo-Vrsac motorway).

2.3.3 Reconstruction of the road section Pozega-Belgrade to meet with motorways TEN-T standards



Type: Road project
From/To: Pozega to Belgrade
Core Corridor: OEM
Country: Serbia
Costs: €1,100 million

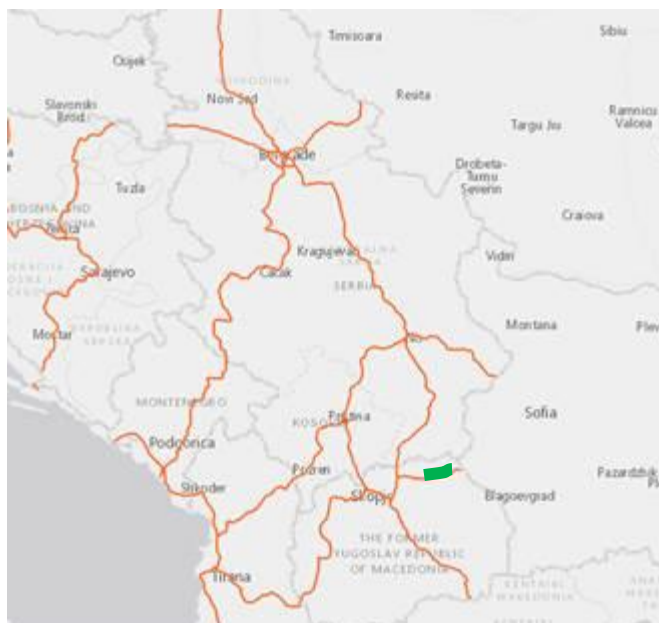
Project status: As sections from Obrenovac to Preljina are already under implementation, remaining preparation activities are related only to section Surcin-Obrenovac and Preljina-Pozega. For the first section, feasibility study and preliminary design were completed in 2011 (as per national legislation and approved by the State Revision Committee in June 2012).

Project benefits: A shorter link between north parts of Serbia and Montenegro (Adriatic coast); Interconnects Central and East European countries with Mediterranean area; Savings (travel time, vehicle operating costs, costs of traffic accidents, etc).

Project financing: This project consists of several LOTs (sections) with separate financing, of which sections 2-5, from Obrenovac to Preljina are already under implementation. For the section 1 Surcin (Belgrade)-Obrenovac and section 6 Preljina-Pozega, Serbian Government initially considers implementation option through a loan arrangement with PR of China and continues negotiations with the Chinese company China Communications Construction Company (CCCC) following signature of Memorandum of Understanding in November 2015. Estimated costs for these two remaining sections are estimated to be €559 million (including the 1766 m long bridge over Sava and Kolubara rivers near Belgrade).

Project associated risks: Issues with financing gap and contracting for the sections Belgrade (Surcin)-Obrenovac and Preljina-Pozega; Expropriation issues may further delay implementation.

2.3.4 Rehabilitation of the road section from Rankovce to Kriva Palanka



- Type:** Road project
- From/To:** Rankovce to Kriva Palanka
- Core Corridor:** OEM
- Country:** the former Yugoslav Republic of Macedonia
- Costs:** €78 million

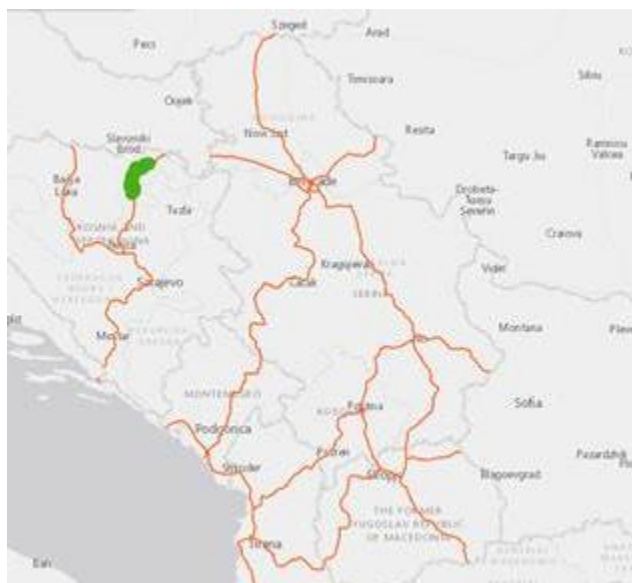
Project status: The design documentation is completed and the land expropriation process is ongoing. Tendering is in the pre-qualification phase for selection of Contractor in accordance with WB Procurement Guidelines (Procurement under IBRD Loans and IDA Credits).

Project benefits: The reconstruction of the existing two lane road (one lane per direction) between Rankovce and Kriva Palanka is expected to reduce significantly travel times, increase LOS and road safety and enhance regional transport activities (Albania, the former Yugoslav Republic of Macedonia and Bulgaria), for both passenger and freight.

Project financing: The Ministry of Finance signed Loan Agreement with the World Bank on October 6th 2015, in the amount of €83 million (€78 million out of the total amount is to be used for the construction of the express road, while €5 million is intended for establishment of bridge management system and institutional support for the Public Enterprise).

Project associated risks: Potential delays in construction start.

2.3.5 Construction of the motorway section Odzak-Vukosavlje-Podnovlje-Rudanka-Doboj South



Type:	Road project
From/To:	Odzak to Doboju South
Core Corridor:	MED
Country:	Bosnia and Herzegovina
Costs:	€369 million

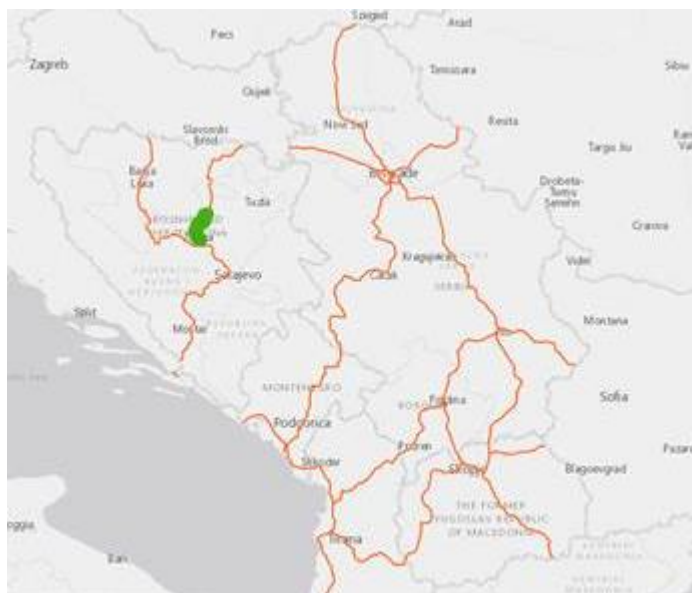
Project status: The pre-feasibility study and conceptual technical design were prepared in 2004, while feasibility study, preliminary design and EIA were prepared in 2006/2007. The updated EIA and main design were completed in 2010/2011. Hence, update of the FS (with CBA) will need to be considered. This section has all technical and other documentation prepared, together with urban and environmental permits obtained. Yet land expropriation is not completed (one of the main preconditions for issuing construction permit). It is noted the main design was prepared six years ago and therefore it needs to be updated (at least unit prices in BoQ). It may be expected that in the short term only subsection/LOT interchange Johovac-interchange Rudanka to be implemented up to year 2020.

Project benefits: The construction of the new motorway between Odzak and Doboju south is expected to reduce significantly travel times, increase LOS and road safety and enhance regional transport activities (Croatia and Serbia to Bosnia and Herzegovina), both passenger and freight.

Project financing: Negotiations with IFIs (EBRD and EIB) are underway for the LOT Johovac-Rudanka. For the remaining parts, two options are considered the first one of which being potential PPP contract with an interested concessionaire, while the second one would be further borrowing (loan) and construction as per the Red FIDIC conditions.

Project associated risks: There is a strong political will and commitments of PE Republic of Srpska Motorways (PE RSM) to construct the part of this section in short term period (Johovac-Rudanka). Main risks related to the remaining LOTs of this section are related to unsecure financing options; Low ranking of the section's priority.

2.3.6 Construction of the motorway section Zenica North-Žepče South



Type: Road project
From/To: Zenica North to Žepče South
Core Corridor: MED
Country: Bosnia and Herzegovina
Costs: €357 million

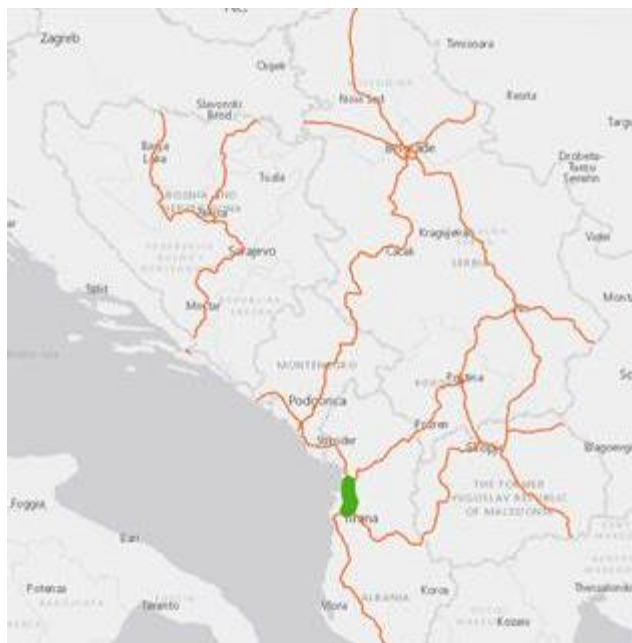
Project status: Feasibility study and preliminary design were updated in 2014 for the subsections Zepce South-Nemila and Nemila-Zenica North. Under IPA 2011 grant, EU is funding analyses of the feasibility study and preliminary design, preparation of main and detail designs and tender documentation for the subsection/LOT Nemila-Zenica North (grant €2.5 million). Spatial planning documents that include this section need to be updated and urban-technical conditions issued. Environmental permits for these LOTs issued. The Beneficiary considers to construct the subsection from Zenica North to Nemila first (whether under Yellow or Red FIDIC condition, depending of designs preparation progress).

Project benefits: The construction of the new motorway between Zenica North and Zepce South is expected to reduce significantly travel times, increase LOS and road safety and enhance regional transport activities (EU Member States/Croatia and Bosnia and Herzegovina), both passenger and freight.

Project financing: Estimated investment costs for the Zepce South-Nemila subsection/LOT is €215 million (excl. VAT), while estimated investment for the Nemila-Zenica North subsection is €142 million (excl. VAT). Financing of the southern subsection/LOT Nemila-Zenica North is under negotiations with EBRD, while implementation of the northern subsection/LOT Zepce South(Poprikuse)-Nemila is considered for the Phase II. Due to limited borrowing capacities, the later subsection is considered to be financed through PPP (communication established with potentially interested companies).

Project associated risks: Financing not secured for the subsection Zepce South-Nemila; Limited borrowing capacity; Lack of interest of potential concessionaires.

2.3.7 Upgrade of Thumane-Vore-Kashar (part of the Adriatic-Ionian Highway)



Type: Road project
From/To: Thumane to Kashar
Core Corridor: MED
Country: Albania
Costs: €97 million

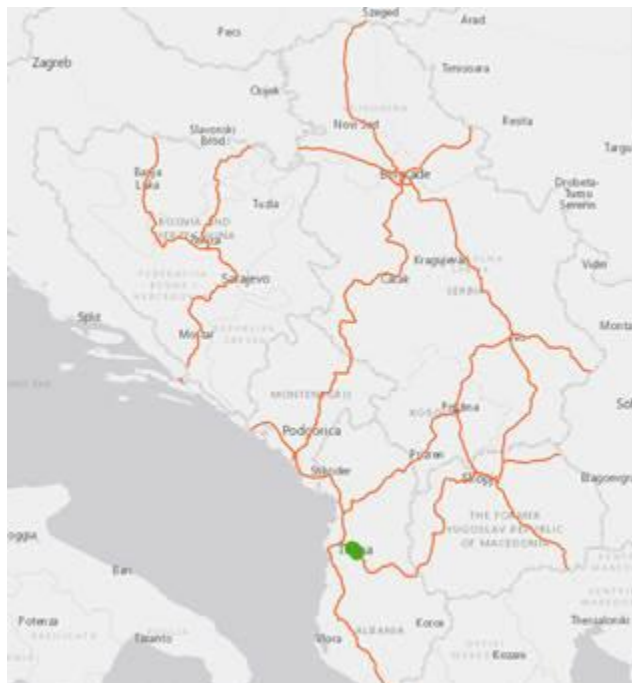
Project status: Feasibility study is prepared, as per the European standards. Preparation of the detail design is ongoing and expected to be completed in July 2016.

Project benefits: Albania has two main corridors, which are North-South (now coincide mainly with the Adriatic-Ionian Corridor) and East-West Corridor, which are included in transport strategies of Albanian Government. The section is also part of Durrës–Morine highway which connects the Pan–European VIII corridor, part of the Western Balkans Core network, and is included in the National Transport Plan proposed by the Government of Albania. The project has a significant regional dimension as it represents also the realisation of the central link on the National North-South corridor (also as Adriatic-Ionian European corridor). The project objective is to reduce travel time, as well as the congestion of traffic flow and bottlenecks, especially during the touristic season, and to increase the road safety. It will also contribute to the reduction of vehicle operating costs and energy consumption.

Project financing: Breakdown of the investment costs: Construction Cost 89,995,771.23 €; Supervision of works €1,730,000.00; Project management: €500,000.00; Contingencies: €4,327,760.10; Communications/evaluation audit: €30,000.00 .

Project associated risks: Financing not secured; delays in resolving land property issues and spatial planning.

2.3.8 Construction of Tirana bypass (part of the Adriatic-Ionian Highway)



Type: Road project
From/To: Tirana Bypass
Core Corridor: MED
Country: Albania
Costs: €110 million

Project status: Financed by the EC and EBRD in 2014 the project has a full Feasibility Study, Conceptual design and Preliminary Design. The project has a preliminary ESIA approved by EBRD, following the completion and approval (by ARA and EBRD) of the Feasibility Study report and its results as per ToR requirements. This study is approved by IFIs and the remaining stage is the preparation of detailed design, full/profound ESIA and tender documents for construction works.

Project benefits: The main objective of the project is to reduce traffic congestion in the capital of Albania, which is presently caused by the transit traffic. It should be mentioned that there is a significant strategic dimension in the realization of this bypass. Tirana Bypass is part of the east-west corridor. It is 21,581 ml long and is identified as one of the important road sections. Hence, the project is included in the Albania's SPP. Construction of Tirane - Elbasan motorway is connecting the West - East Corridor of Albania (Durrës - Tirana - Border with the former Yugoslav Republic of Macedonia and Greece).

Project financing: Cost breakdown: WBIF grant €1 million; EBRD sovereign loan €32.5 million; Beneficiary contribution €6.5 million; Gap financing €70 million.

Project associated risks: Financing not secured;

3. Rail network

3.1 Gap Analysis

Similar to the analysis of the road network, during the second phase of the study ("Study Phase"), the compliance check exercise focused on the TEN-T Core Corridors extension in the Region, rather than the entire WB Core Rail Network. The three core corridors are the Orient-East Mediterranean (OEM) Corridor, the Mediterranean (MED) Corridor and the Rhine-Danube Corridor. The network links making up these corridors were identified by the consultants to be as follows:

- OEM Corridor – Rail Network (*Total length 1,602 km*):
 - Section: Budapest – **Subotica – Belgrade – Niš – Skopje – Gevgelija** – Thessaloniki
 - Section: **Stalać – Kraljevo – Pristina – Skopje (Trubavero)**
 - Section: **Beograd (Resnik) – Podgorica – Bar**
- MED Corridor – Rail Network (*Total length 689 km*):
 - Section: Zagreb – **Sid – Pazova (Belgrade)**
 - Section: **Samac – Sarajevo – Capljina** – Ploce
 - Section: Podgorica – Tuzi – Hotit – Vore – Tirana – Vore – Durres

In the following map, the proposed alignment for the rail network is presented. It is noted that the proposed alignment is entirely based on the Core Transport Network for the Western Balkans region, as agreed in 2015. The Core Network for the region is based on the Comprehensive Network, established under MoU, as well as the SEETO and TEN-T methodology for the definition of the TEN-T Core Network. Data on these rail links are collected and maintained by SEETO Secretariat (SEETIS database). The present gap analysis used the most recent available data included in the SEETIS database (2014).

Figure 3.1 The Core Corridors proposed alignment for the Rail Network



Based on the compliance exercise that was performed during the Scoping Phase of the Study, there are currently no rail segments in the WB region that are fully compliant with all TEN-T requirements for the rail network. More specifically, the requirements for the railway infrastructure that were examined during this exercise are:

- Electrification: rail network to be electrified by 2030 (including sidings where necessary)
- Axle load: Freight lines 22.5 t axle load by 2030
- Line speed: Freight lines must allow 100 km/h by 2030 (NB: no speed requirement for passenger lines)
- Train length: Freight lines to allow for 740m trains by 2030
- Track gauge: Nominal track gauge for new railway lines 1435 mm
- ERTMS / signalling system: Core network to be equipped with ERTMS by 2030

Looking at each TEN-T standard separately, it seems that in terms of electrification, 78% of the OEM Corridor and 74% of the MED Corridor are compliant. Moreover, in terms of axle load, 87% of the freight lines along the OEM Corridor and 77% along the MED Corridor, allow for 22.5 tonnes.

However, only 45% of the OEM Corridor and 12% of the MED Corridor are compliant in terms of maximum operating speed. This is an interesting finding, if one takes into account the fact that the design speed in more than 85% of the OEM Corridor and 74% of the MED Corridor is more than 100 km/h, which is the threshold for compliance. These results clearly indicate that a large percentage of the problems that the railway network in the region faces, are due to lack of proper maintenance.

An overview of the compliance gaps of the railway infrastructure per each TEN-T criterion is presented in the following Table and the respective maps for the year 2014. It is noted that the ERTMS TEN-T standard (full deployment of ERTMS) was not taken into account at this stage, as no railway section in the region is currently compliant.

Table 3.1 Compliance Rates for the Core Corridors – Rail Network (2014)

TEN-T requirement		OEM Corridor		MED Corridor	
		Km	%	Km	%
Electrification	Compliant sections	1,278	79.77	508	73.73
	Non-compliant sections	324	20.23	181	26.27
Axle Load	Compliant sections	1,387	86.59	533	77.36
	Non-compliant sections	215	13.41	156	22.64
Operating speed	Compliant sections	722	45.06	80	11.61
	Non-compliant sections	880	54.94	609	88.39
Maximum train length	Compliant sections	0	0.00	0	0.00
	Non-compliant sections	1040	64.92	572	83.02
	No available data	562	35.08	117	16.98
Track gauge	Compliant sections	1,602	100.00	689	100.00
	Non-compliant sections	0	0.00	0	0.00
ERTMS (full deployment)	Compliant sections	0	0.00	0	0.00
	Non-compliant sections	1,602	100.00	689	100.00
Total Length		1,602 km		689 km	

Note: For the 35.08% and the 16.98% of the OEM and MED Corridors, respectively, that no data is available on maximum train length allowed, it is assumed that these are not compliant with the train length > 740 m. TEN-T standard.

Figure 3.2 The *Electrification Compliance Gaps* for the Core Corridors – Rail Network (2014)



Figure 3.3 The *Axle Load Compliance Gaps* for the Core Corridors – Rail Network (2014)

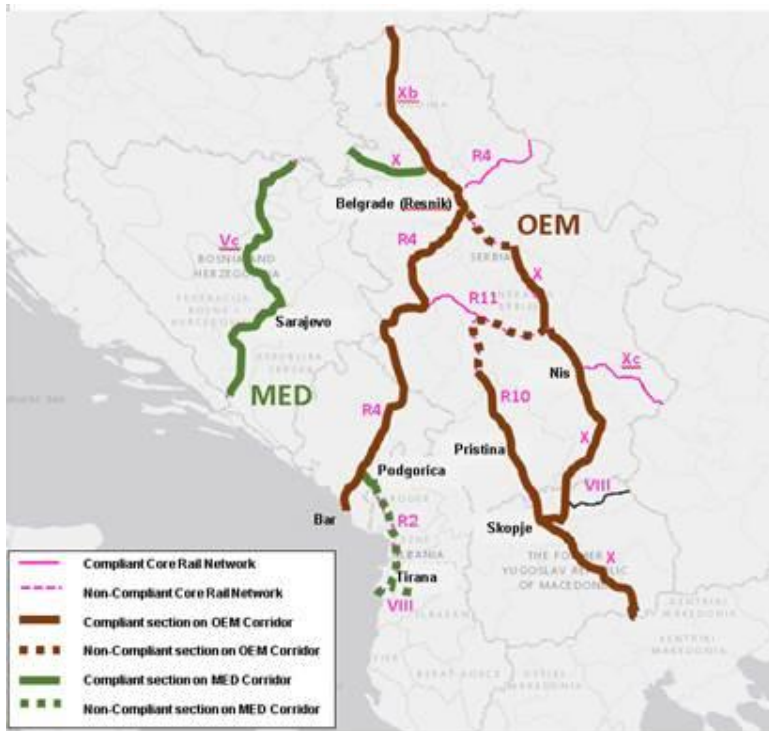


Figure 3.4 The *Operating Speed Compliance Gaps for the Core Corridors – Rail Network (2014)*



For the identified infrastructural compliance gaps, all necessary projects in order for the existing railway infrastructure to meet with the TEN-T standards, have been listed and thoroughly analysed. The main aim is to draw reliable conclusions in terms of their maturity level and have a clear picture of their implementation timeframe. The ultimate goal is for the two Core Corridors to become fully compliant, enhancing thus connectivity within the WB region, as well as between the WB region and the EU Member States.

An overview of the identified projects is presented in the following sections for each Core Corridor.

3.2 Review of projects

3.2.1 Orient-East Med (OEM) Corridor

For the OEM Rail Corridor 14 investment projects have been identified, also taking into account the national Single Project Pipelines (SPPs) and the SEETO Multi-Annual Plan (MAP) 2016. It is noted that for the OEM Corridor, the rail section between Kumanovo and Deve Bair (Border with Bulgaria) in the former Yugoslav Republic of Macedonia is also considered, since a project for the rail segment between Beljakovce and Deve Bair (Border with Bulgaria) was included in the list of pre-identified projects for the OEM Corridor in the Connectivity Agenda (Western Balkans Summit – Vienna 2015). This rail section is part of Corridor VIII and consists of a significant link with Bulgaria. Currently, this rail segment is not in operation. Thus, for the OEM Corridor **15 investment projects** in total were analysed.

Table 3.2 Investment Projects on OEM Corridor – Rail Network

	Project	Country	TEN-T Standard to be met	Investment Cost (million €)	Status	Maturity Level
1	Modernisation of the Nis-Presevo (border with MKD) railway line	SER	Maximum train length	165	PFS, FS, PD, ESIA, Spatial Planning are ongoing	Low
2	Reconstruction, modernisation and construction of the second track on the section Stalac-Djunis of the railway line Beograd-Nis	SER	Maximum train length	150	PFS is completed, FS, PD, ESIA, Spatial Planning are ongoing	Medium
3	Modernisation for the contemporary double track traffic of the single track section of the railway line Resnik - Klenje - Mali Pozarevac - Velika Plana	SER	Axle Load, Operating speed, maximum train length	352	PFS is completed	Low
4	Modernization and Reconstruction of the Railway Line Velika Plana - Stalac	SER	Maximum train length	212	PFS and Spatial Planning are completed, Land property issues are ongoing	Low
5	Construction of railway section along the corridor X Dracevo – Veles	MKD	Operating Speed, Maximum train length	NA	FS, CBA, EIA are completed (Note: CBA results indicate that this project is not viable – no further preparatory actions were undertaken)	Low
6	Rehabilitation and modernisation of the railway section along Corridor X Tabanovci - Dracevo	MKD	Electrification (Tabanovci-Kumanovo), Operating speed, maximum train length	NA	Construction works completed	No need for co-financing
7	Rehabilitation and modernisation of the railway section along Corridor X Veles Gevgelija	MKD	Operating speed, maximum train length	NA	NA	Low ²
8	Reconstruction and modernisation of the railway line Belgrade-Novı Sad - Subotica - border with Hungary (Kelebjia)	SER	Operating speed, maximum train length	541	PFS, FS, PD, ESIA are completed	High

² Note: sub section Nogaevci – Negotino rehabilitation works will be completed until the end of 2016, sub section Miravci – Smokvica rehabilitation works are completed, for the rest of the sub sections no documentation is available

	Project	Country	TEN-T Standard to be met	Investment Cost (million €)	Status	Maturity Level
9	Rehabilitation and modernization of the railway section Blace – Gjorce Petrov to meet with the TEN-T standards, including electrification	MKD	Electrification, Operating Speed, Maximum Train length	NA	NA	Low
10	General Rehabilitation of Railway Route 10 (Border with Serbia Leshak –Fushë Kosovë – Hani i Elezit – Border with the former Yugoslav Republic of Macedonia), including electrification of the line	KOS	Electrification, Operating speed, Maximum train length	194	PFS, FS are completed, Land property issues are resolved, ESIA, DD and Spatial Planning are ongoing	Medium
11	Reconstruction and Modernization of the railway line Stalac – Kraljevo - Rudnica	SER	Electrification, operating speed, Axle load, Maximum train length	203	PFS is ongoing	Low
12	<i>Rail Route 4 (Bar - Vrbnica) - Signaling Podgorica and Bridges³</i>	<i>MNE</i>	<i>Operating speed, maximum train length</i>	<i>40</i>	<i>PFS, FS, PD, ESIA, Spatial Planning are completed, Land property issues are resolved, DD, Construction and other permits are completed, Tender documentation are ongoing</i>	<i>High</i>
13	Reconstruction and Modernization Railway Line (Belgrade) - Vrbnica – Bar 1) Rehabilitation of Train Track (superstructure), Culverts, Regulation of watercourse, reconstruction of steel bridges 2) Rehabilitation of Slopes 3)Rehabilitation of landslides, tunnels, concrete bridges i electrical works	MNE	Operating speed, maximum train length	153	No available documentation	Medium
14	Rehabilitation of the railway section Resnik-Vrbnica to meet with the TEN-T standards	SER	Maximum train length	NA	NA	Low

³ This project is already approved for co-financing

Project	Country	TEN-T Standard to be met	Investment Cost (million €)	Status	Maturity Level	
15	Construction of the railway section Beljakovce – Kriva Palanka – Border with Bulgaria	MKD	Electrification, axle load, operating speed, maximum train length	596	PFS, FS, DD, Tender documentation are completed	High
Total			2,546			

Note: PFS - Pre feasibility Study
 FS - Feasibility Study
 PD -Preliminary Design
 DD -Detail Design
 ESIA - Environmental and Social Impact Assessment

It is noted that for the railway section Belgrade (Resnik) – Vrbnica (Route 4) in Serbia, where the operating speed, as well as the axle load TEN-T standards seem to be met, it is well known that this railway line is not well maintained and significant capacity constraints are identified.

Furthermore, for the electrification of the railway line Kraljevo-Pristina-Blace-Gjorce Petrov (Rail Route 10) it is noted that there must be a unified approach among the three involved countries (Serbia, Kosovo and the former Yugoslav Republic of Macedonia). Thus, even though the electrification is currently included in the projects' design, its implementation will follow a phased approach, according to the coordination among the Beneficiaries and decision making processes followed by each country.

The total investment cost for the identified railway projects, excluding the ones for which financing is secured, is estimated to be approximately €2.6 billion. In the following Figure, the investment cost per maturity level for the identified projects is presented. It should be noted that regarding the maturity level of the projects, the following assumptions were made:

1. High maturity projects: projects on which construction is likely to start by 2020
2. Medium maturity projects: projects on which construction is likely to start near 2020, but with high risks for delays
3. Low maturity projects: projects on which construction will start after 2020

For the rail projects of high maturity (projects likely to be implemented before 2020), a more detailed analysis is presented in Chapter 3.3, while all detailed information for all identified projects can be found in Project Appendix, where all the Project Fiches are presented.

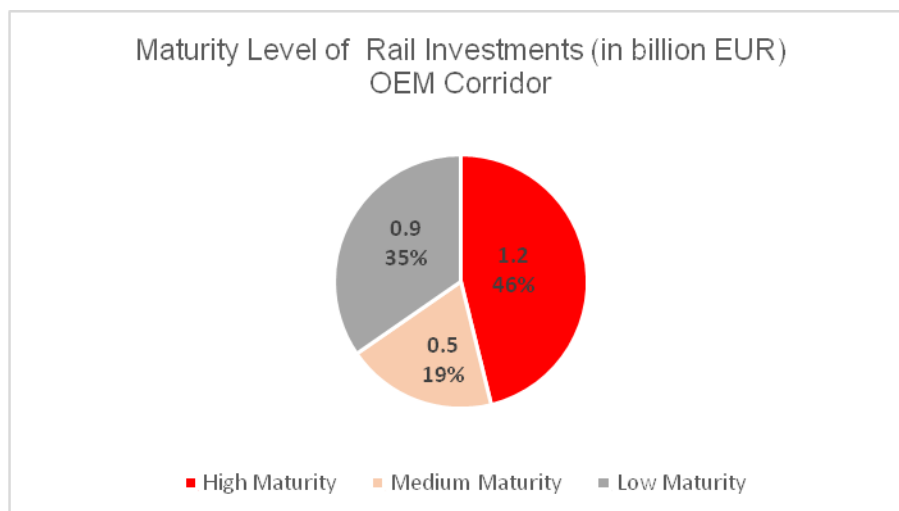


Figure 3.5 Maturity level of rail projects on the OEM Corridor

3.2.2 Mediterranean (MED) Corridor

For the MED Corridor, 8 railway projects were identified during the scoping phase, taking into account the National SPPs, as well as the SEETO MAP 2016. The significant infrastructural limitations of the MED Rail Corridor, especially in terms of operating speed, are evident throughout the Corridor. A brief overview of the identified projects is presented in the following Table.

Table 3.3 Investment Projects on MED Corridor – Rail Network

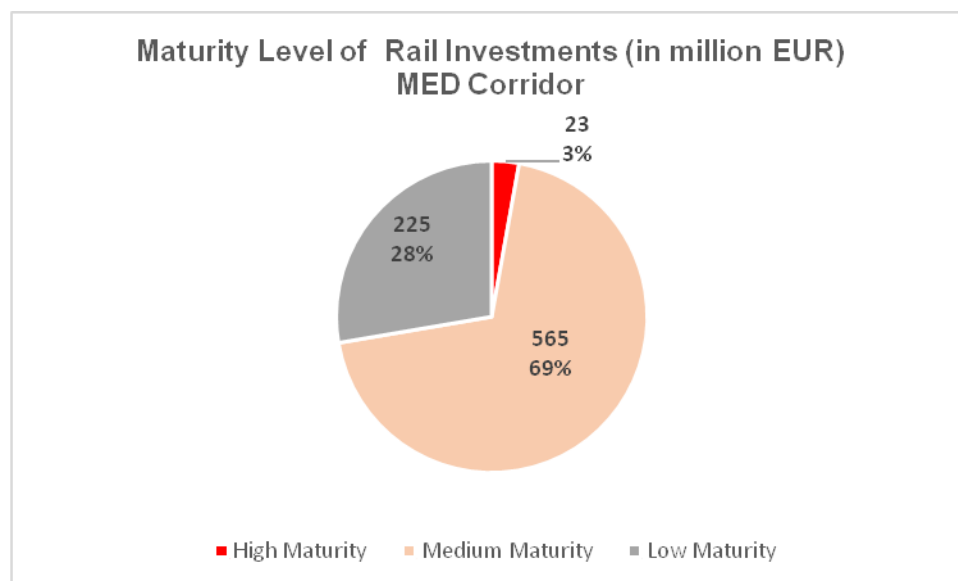
	Project	Country	TEN-T Standard to be met	Investment Cost (million €)	Status	Maturity Level
1	Overhaul of the railway section Sarajevo-Podlugovi	BIH	Operating speed, maximum train length	23	FS is completed, DD is ongoing	High
2	Rehabilitation and modernization works of the railway section Bosanski Samac – Podlugovi to meet with the TEN-T standards	BIH	Operating speed, maximum train length	129	DD and Tender Documentation are completed, FS is ongoing,	Medium
3	Rehabilitation and modernization works of the railway section Sarajevo – Capljina to meet with the TEN-T standards	BIH	Operating speed, maximum train length	44	The project is considered fully prepared and no further preparation activities are envisaged. Construction works are ongoing.	No need for co-financing
4	Modernisation of the railway line of Tirana-Durres	ALB	Operating speed, axle load, maximum train length	61	PFS, FS, PD, ESIA, Spatial planning are completed, Land property issues, DD, Tender documentation are ongoing	Medium
5	Modernization of the Railway Line Stara Pazova – Sid – Croatian border	SER	Maximum train length	190	PFS is completed, PD is ongoing	Low
6	Reconstruction of the Railway Line Novi Beograd – Zemun – Batajnica Stara Pazova	SER	Maximum train length	210	PFS is completed	Medium
7	Improvement of the railway link Durres-Vora - Shkodra - Hani i Hotit	ALB	Electrification, axle load, operating speed, maximum train length	165	PFS, FS and ESIA are completed	Medium

	Project	Country	TEN-T Standard to be met	Investment Cost (million €)	Status	Maturity Level
8	Route 2: Reconstruction and Modernisation Railway line Podgorica-Tuzi - Cross Border with Albania	MNE	Electrification, Operating speed, maximum train length	35	DD are ongoing	Low
	Total			812		

Note: FS - Feasibility Study
 PD -Preliminary Design
 DD -Detail Design
 ESIA - Environmental and Social Impact Assessment

The total investment cost for the identified railway projects for the MED Corridor, excluding the ones for which financing is secured, is estimated to be approximately €0.80 billion. In the following Figure, the investment cost per maturity level of the identified projects is presented. For the rail projects of high maturity (projects likely to be implemented before 2020), a more detailed analysis is presented in Chapter 3.3, while all detailed information for all identified projects can be found in the Project Appendix, where all the Project Fiches are presented.

Figure 3.6 Maturity level of rail projects on the MED Corridor



3.3 Overview of mature projects

For both OEM and MED Core Corridors, 23 railway projects were identified in total.

Figure 3.6 Identified rail projects



Based on the analysis undertaken during the Study Phase, in close collaboration with all involved Beneficiaries and Stakeholders, 4 out of these 23 railway projects that were analysed, were found to be of high maturity and most likely to be implemented before 2020. A brief overview of these projects is presented as follows.

3.3.1 Reconstruction and modernisation of the railway line Belgrade-Novı Sad - Subotica - border with Hungary (Kelebija)



Type: Railway project
From/To: Belgrade to Kelebija
Core Corridor: OEM
Country: Serbia
Costs: €541 million

Project status: For the Novi Sad-Subotica (Hungarian border) segment, development of the Preliminary Design, along with the Feasibility Study and the Environmental Impact Assessment (EIA) Study has been funded through IPA 2011 (completed 2H 2015). The preliminary design has been submitted for approval to the Republic Revision Committee delegated by the Ministry of Construction, Transport and Infrastructure. For the adjacent, more mature (investment financing with the Russian Government loan) section Stara Pazova-Novı Sad, the preliminary design has been prepared with JSC Serbian Railways own resources while the feasibility study and EIA were prepared through IPA 2008 (Project Preparation Facility). In complementary process, following tri-lateral negotiations (the Memorandum Serbia-Hungary-China) for modernisation of the railway line from Belgrade to Budapest (approx. 184 km in Serbia), the process of unification and harmonisation of technical documentation is ongoing (pre-feasibility study prepared by Chinese TDSI adopted in July 2015), steered by the tri-lateral Work Group established Sept 2015. Also, the governments of China, Serbia, Hungary and the former Yugoslav Republic of Macedonia have signed the Agreement on Railway Transport Modernisation, which prioritises the construction of the Belgrade-Budapest high-speed railway. The drafting of the documentation and preliminary design is expected to be completed by the end of 2016, with contracting in accordance with the defined model indicated for second quarter of 2017.

Project benefits: Through possible modal shifting of the transport flow from road to rail, reduction of the traffic congestion on the road corridor will be achieved. In addition, introduction of new technologies for traffic management, as well as through increase of commercial running speeds, operating expenses will be reduced.

Project financing: Funding has not yet been secured. However, complementary to this project, modernisation of the entire line from Belgrade to Budapest (double track for speeds up to 200 km/h) is under tri-lateral negotiations (Memorandum of Understanding on Cooperation of the Hungarian-Serbian Railway Project between the NDRC of the PR China, the Hungarian Ministry of Foreign Affairs and Trade and the MoCTI of the Republic of Serbia) on further project development and investments. In line with this, Serbian Government signed non-binding General Agreement with Chinese EXIM bank for financing sections Novi Sad-Hungarian border and Belgrade-Stara Pazova (the commercial contract under negotiations). It is further noted that the section Stara Pazova-Novı Sad is to be funded by the Russian Government loan (Annex 3, approx. €450 million with 15 % of Serbian contribution signed Dec 2013) and for which works are due to start in 2016 (estimated duration of 40 months). For this project, under the 2016 Budget Law, funds amounting to €9 million are foreseen, as well as €40 million in 2017.

Project associated risks: Source(s) of funding not being secured. Hence risks are mainly related to potential untimely provision of funds for the works and problems related to land expropriation.

3.3.2 Rail Route 4 (Bar - Vbrnica) - Signaling Podgorica and Bridges



Type: Railway project

From/To: Bar to Vrbnica

Core Corridor: OEM

Country: Montenegro

Costs: €40 million

Project status: Tender documentation in preparation. Works expected to start 1Q 2017.

Project benefits: An improvement in safety on the railway line (reduced risk of a physical structural failure or operating failure leading to an accident). The project will benefit directly 750,000 passengers using the line on annual basis and indirectly the broader economy by facilitating trade, regional integration and sustainable growth. The railway system will also be better placed to compete against road hauliers in the freight business, potentially improving the financial sustainability of the sector.

Project financing: Financing with EIB loan.

Project associated risks: -

3.3.3 Construction of the railway section Beljakovce – Kriva Palanka – Border with Bulgaria



Type: Rail project

From/To: Beljakovce to Deve Bair (Border with Bulgaria)

Core Corridor: OEM

Country: the former Yugoslav Republic of Macedonia

Costs: €596 million

Project status: The feasibility study (incl. CBA) with preliminary design and EIA study started December 2010 and was completed in December 2011 and November 2012, respectively. Four grants have been approved under WBIF one of which was for the subsection Kumanovo-Beljakovce (WB5-MKD-TRA-01 €1.5 million) for the main design and assistance in preparation of tender documents and another (WB7-MKD-TRA-03 €2.5 million) was for supervision of works (additional €200k required were provided from the EBRD's Shareholder Special Fund). For the subsection from Beljakovce toward Kriva Palanka and Deve Bair, two grants were approved under WBIF of which WB7-MKD-TRA-02 (€ 2.7 million) was for the main design and assistance in preparation of tender documents and WB11-MKD-TRA-01 (€3 million, Beljakovce-Kriva Palanka) was for the supervision of works. Preparation of the main design for Kriva Palanka-Deve Bair has been funded through national IPA. Therefore main designs and tendering have been completed except for the subsection Kriva Palanka-Deve Bair (tendering pending completion of the main design which under preparation). Construction works are underway for the Kumanovo-Beljakovce section (started March 2014 and due to be completed Sept 2016).

Project benefits: Modal shift from road to rail transport; Reduced energy consumption and reduced vehicle operation costs; Reduced emissions and significant environmental benefits.

Project financing: The breakdown of total investment costs: Construction works with installation of signalling and telecommunications €522 million; Electrifications €38 million.; Supervision for all types of construction works, signalling, telecommunications and electrification €29 million.; Design €7,115 million. The VAT being national contribution not included above. Financing to date: Four WBIF grants of total €9.7 million, EBRD grant of €0.5 million, two sovereign loans from EBRD in amounts of €149.5 million and

€46.4 million (signed Aug 2012), country's own contribution €26 million - the VAT related to the construction works.

Project associated risks: -

3.3.4 Overhaul of the railway section Sarajevo-Podlugovi



Type: Rail project
From/To: Sarajevo to Podlugovi
Core Corridor: MED
Country: Bosnia and Herzegovina
Costs: €23 million

Project status: WBIF supported preparation of the project (WBIF TA grant TA2-BIH-TRA-02, €600k) with a Feasibility Study (Nov 2011, approved Jan 2012) which comprised also an environmental elaboration (as Phase I) to assess in economic terms the pre-defined preferred option of a single track overhaul and with a Main Design comprising also draft tender documents (as Phase II) of track overhaul. However, the detail design is still to be prepared.

Project benefits: Meeting capacity demand for freight transport on the Pan-European Corridor VC; Better connection of heavy industry and clients; Ensure smooth and efficient movement of goods and passengers between BiH and EU.

Project financing: The Beneficiary is considering to apply for EU co-funding.

Project associated risks: Potential delays in provision of the financial resources for the preparation of the lacking technical document

4. Ports and Inland Waterways

4.1 Gap analysis

The Inland Waterways (IWW) Core Network in the Western Balkans region includes parts of the Danube River from Bezdán in Serbia to Timok River (Serbian Borders with Romania and Bulgaria), as well as parts of the Sava River from Belgrade to Jamena in Serbia and from Ustica to Raca in Bosnia and Herzegovina. Furthermore, Tisa River from the Serbian Border with Hungary to the Danube River is also part of the Core Network. All these IWW sections are part of the Rhine-Danube Core Network Corridor.

More specifically, with regards to IWW, as well as IWW ports, the following links and nodes will be included in the Rhine-Danube Core Network Corridor:

IWW links:

1. **Danube River**, total length 589 km from Bezdán to Timok River in Serbia.
2. **Sava River**, total length 619 km from Ustica to Raca in BiH (332 km) and from Jamena to Belgrade in Serbia (287 km).
3. **Tisa River**, total length 164 km from Border with Hungary to Danube River in Serbia.

IWW nodes:

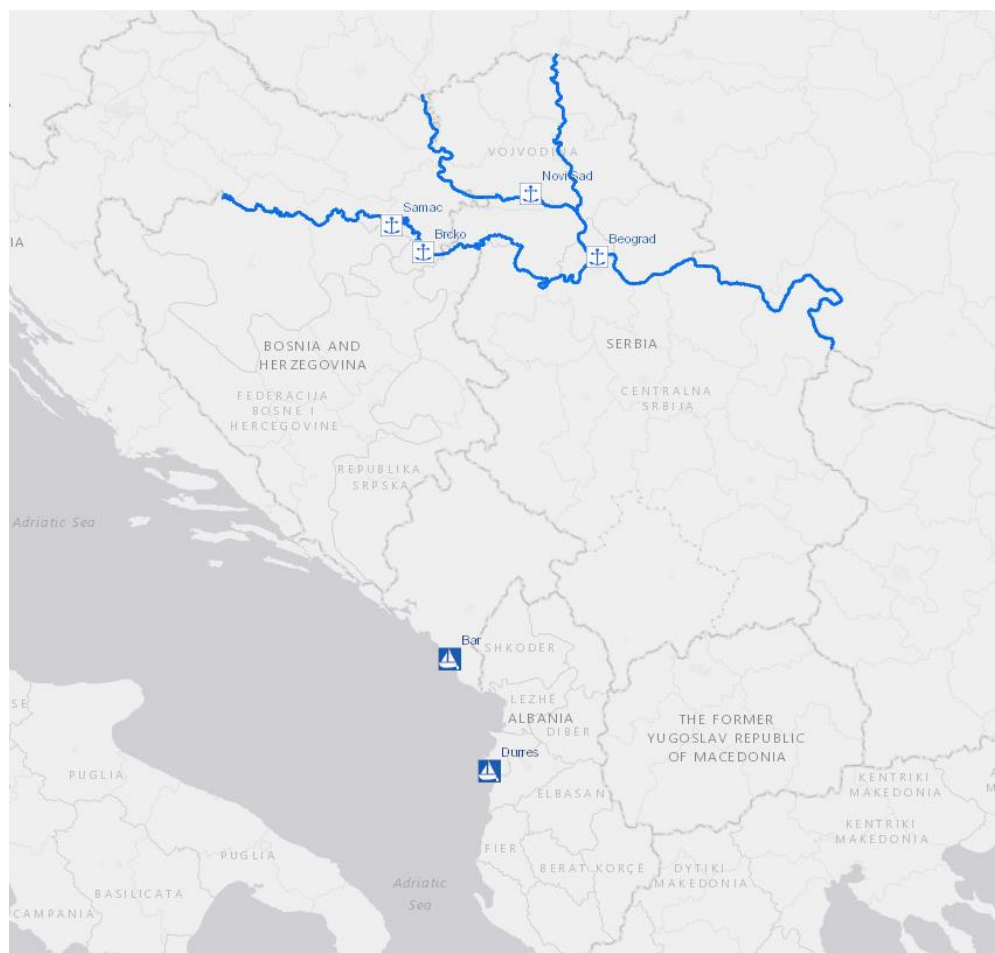
4. **Port of Belgrade** in Serbia
5. **Port of Novi Sad** in Serbia
6. **Port of Brcko** in Bosnia and Herzegovina
7. **Port of Samac** in Bosnia and Herzegovina

Furthermore, the maritime ports of Durres in Albania and Bar in Montenegro were also examined. It is noted that the port of Durres is part of the Mediterranean Corridor, while the port of Bar is an overlapping node in both Mediterranean and Orient-East Med Corridors.

Maritime nodes:

8. **Port of Durres** in Albania
9. **Port of Bar** in Montenegro

Figure 4.1 Core IWW Network and Core River and Maritime Ports



The compliance gap analysis for the IWW was elaborated during the Scoping Phase of the project and was based on the infrastructure requirements of the TEN-T Core Network set out in the Regulation 1315. These requirements for IWW and ports are:

Inland waterways

Indication on the infrastructure parameters per section, verifying the compliance at least with class IV requirements according to ECMT, in particular:

- Length of vessels and barges: from 80-85m
- Maximum beam: from 9.50m
- Minimum draught: from 2.50m
- Tonnage: from 1000-1500t
- Minimum height under bridges: from 5.25/7.00m
- Indication on the availability of alternative clean fuels in inland ports by 2030

Maritime and IWW ports

- Connection to rail network, inland waterways and road network: core ports to be connected to rail by 2030.
- Availability of alternative clean fuels by 2030

An overview of the compliance gap exercise findings for the IWW and ports is presented as follows. It is noted that for the compliance exercise, the most recent available data included in the SEETIS database were used (2014).

Danube River

100% of the Danube River is compliant with the ECMT Class, maximum vessel length, tonnage and minimum height under bridge TEN-T standards. However, with regards to the minimum draught TEN-T standard, the IWW link between Bezdan and Novi Sad (181 km long, approximately 30% of the entire Danube SEETO Core Corridor) is not compliant, consisting thus, of an infrastructure gap. Furthermore, particular attention should be paid to the border crossing with Hungary on the Danube River.

Sava River

Approximately 95% of Sava River is currently compliant in terms of ECMT Class, and the entire Corridor is compatible in terms of maximum vessel length, tonnage and minimum height under bridge TEN-T standards. Furthermore, with regards to minimum draught, it is noted that only 13% of the Corridor (80 km between Belgrade and Vrbica in Serbia) is compliant with the respective TEN-T standard.

Tisa River

Currently the IWW link on Tisa River is compliant with TEN-T standards in terms of ECMT Class.

IWW and Maritime Ports

All IWW and Maritime ports included in the SEETO Core Network are compliant with the TEN-T standards, having an existing rail connection.

4.2 Review of projects (Rhine-Danube Corridor)

For the Rhine-Danube Corridor, **6 projects** were identified during the Scoping Phase, taking into account the National SPPs and the SEETO MAP 2016.

The projects for the Danube River refer to river training and dredging works on the Serbia-Croatia joint stretch of Danube (from Bezdan to Backa Palanka) and the Banka Palanka – Belgrade IWW link. These projects will address the compliance gaps identified on the Danube River. At the same time, the projects for the Sava River refer to the demining of the Sava River right bank, as well as rehabilitation, river training and dredging works on critical sections of the Sava. Regarding the demining project, a project of great significance for ensuring the safety of IWW transportation in the area, the Detail Design is completed. It should be noted that the demining process is one of the **most important preconditions for the Sava river waterway** and no other projects could be considered, unless this is implemented.

Furthermore, a project for the River port of Brcko is also included in the list of identified projects. This project is one of the five pre-identified projects for the Core Corridor Rhine-Danube, as agreed upon during the WB Vienna Summit in 2015 (Connectivity Agenda).

An overview of the identified projects for the Rhine-Danube Corridor is presented in the following Table.

Table 4.1 Investment Projects on Rhine-Danube Corridor – IWW Network

	Project	Country	Investment Cost (million €)	Status	Maturity Level
1	River training and dredging works on critical sectors on the SRB-CRO joint stretch of the Danube River	SER	49	PFS and CD are completed, Special planning documents are completed and approved, FS and PD is ongoing	Medium
2	River training and dredging works on critical sectors on the sectors on the Danube river in Serbia between Backa Palanka and Belgrade	SER	14	The project is considered fully prepared and no further preparation activities are envisaged. Construction works begun in 11/2015.	No need for co-financing
3	River training and dredging works on critical sectors on the Sava river	SER	9	PFS and CD are completed, Special planning documents are completed and approved, FS is ongoing	Medium
4	Reconstruction and modernisation of River Port of Brcko	BiH	14	ESIA and DD are completed, Special planning documents are completed and approved, and Construction and other permits are ongoing.	High
5	Rehabilitation and improvement of the Sava river waterway	BiH	21	PFS, FS and PD are completed, ESIA is ongoing	High
6	Demining of the Sava River right bank from the confluence of Drina river of the confluence of Una river	BiH	8	DD is completed	High
	Total		115		

Note: PFS - Pre Feasibility Study
 CD - Conceptual Design
 FS - Feasibility Study
 PD - Preliminary Design
 DD - Detail Design
 ESIA - Environmental and Social Impact Assessment

The total investment cost for all identified IWW and ports projects, excluding the ones for which financing is secured, is estimated to be approximately €115 million, €62.70 million of which for the Danube River and €52.70 million for the Sava River. The projects are shown in the following map.

Figure 4.2 Identified IWW projects

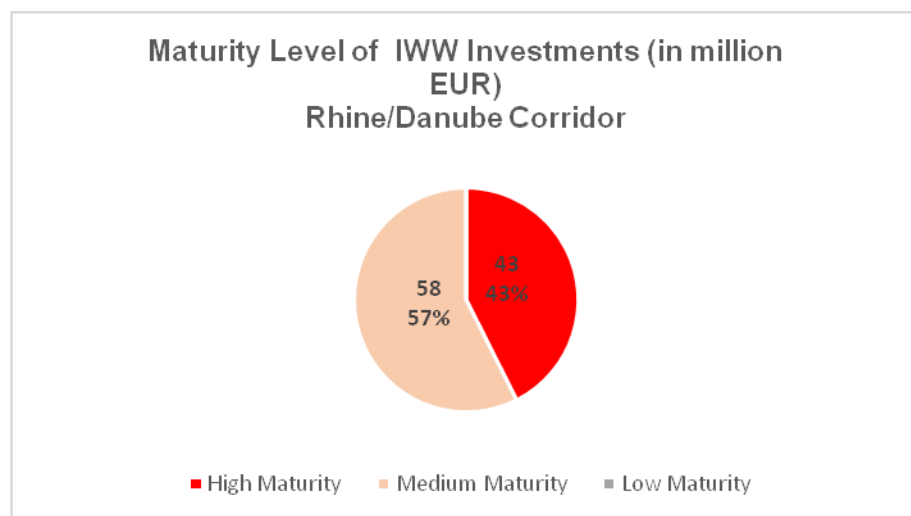


Furthermore, it should be noted that regarding the maturity level of the projects, the following assumptions were made:

1. High maturity projects: projects on which construction is likely to start by 2020
2. Medium maturity projects: projects on which construction is likely to start near 2020, but with high risks for delays
3. Low maturity projects: projects on which construction is likely to start after 2020

For the IWW projects of high maturity (projects likely to be implemented before 2020), a more detailed analysis is presented in section 4.3, while all detailed information for all identified projects can be found in Project Appendix, where all the Project Fiches are presented.

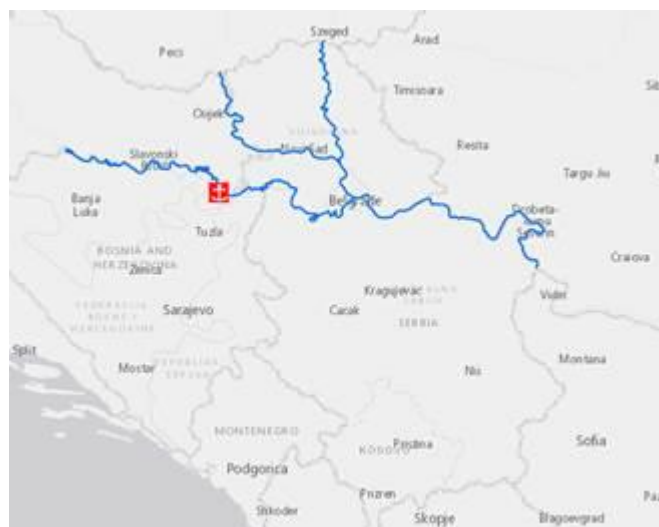
Figure 4.3 Maturity Level of IWW projects



4.3 Overview of mature projects

Based on the analysis undertaken during the Study Phase, in close collaboration with all involved Beneficiaries and Stakeholders, 3 out of the 6 IWW and River Ports projects for the Rhine/Danube Corridor that were analysed, were found to be of high maturity and most likely implemented before 2020. A brief overview of these projects is presented as follows.

4.3.1 Reconstruction and modernisation of River Port of Brcko



- Type:** River Port project
- From/To:** Brcko
- Core Corridor:** Rhine-Danube
- Country:** Bosnia and Herzegovina
- Costs:** €14 million

Project status: The design documentation and EIA were provided in 2012 with all permits also provided in the same year. The Beneficiary provided four designs which related to construction and reconstruction of the connection railway tracks, road and asphalt plateau. A valid spatial planning document has been prepared and adopted and urban and environment permits issued for all related projects. On the other hand, construction permits were obtained for only three of those related projects in 2012. Nevertheless, these have expired and renewal is needed. No PFS and FFS (including CBA) have been provided not has the preliminary design made prior the main designing phase. In addition, there are two additional segments of the project which are in stage of project preparation. These segments comprise Phase 2 namely: Aquatorium cleaning and maintenance; and development of the infrastructure for transferring diesel and liquid cargo. For these Phase II segments it is necessary to prepare appropriate feasibility studies and other technical documentation.

Project benefits: By implementing this project, together with the rehabilitation of the Sava River Waterway, the competitive position of the Port of Brcko will increase significantly. The current level of operational efficiency of the Port of Brcko will improve and it will have an impact to the overall competitiveness of the Brcko District as a transportation hub in BiH and the region.

Project financing: The funding needed for the remaining project preparation and for investment financing. BiH submitted an Investment grant request to WBIF co-financing and technical assistance in 2016 (€3.5 million), as per the following breakdown: TA - €1.0 million of which € 0.5 million for supervision of works and €0.5 million for project management and support to PIU, preparation of tender dossier and public procurement) INV - € 2.5 million. However, the above grant amount does not include two components - Supply and installation of portal (harbour) crane and Aquatorium cleaning and maintenance.

Project associated risks: Inefficient operations of the Port do have a negative effects on its competitiveness and the development of traffic flow and indirectly on creating a stimulating economic environment in the Brcko District.

4.3.2 Rehabilitation and improvement of the Sava river waterway



Type: IWW project
From/To: Brcko to Confluence with Drina river (Raca)
Core Corridor: Rhine-Danube
Country: Bosnia and Herzegovina
Costs: €21 million

Project status: The PFS (incl. preliminary design solution) and feasibility study (FS) prepared. FS (incl. CBA) analysed two scenarios, the first of which is improvement of the river Sava waterway to navigation class IV and the second one being improvement of the river Sava waterway to navigation class Va. Also, the ToR for main design requires improvement of the river Sava waterway to navigation class IV (between Sisak and Brcko) and to navigation class Va (from Brcko toward Belgrade). Such "mixed" (class-from-to) scenario not analysed by FS (incl. CBA). FS needs to be updated (in accordance with the EC guide to CBA). Furthermore, Preliminary design is based on surveys executed before the 2014 floods so it needs to be updated on the basis of new surveys and with updated unit prices. The next steps toward preparation of the River Sava fairway improvement project involves addressing the gaps in the earlier feasibility work in areas such as river morphology, climate change, and integration with other ongoing projects (Requirements of the EU Water Framework Directive), prior to preparing the detailed design for the interventions, the exact costing, and the draft tender documentation for the engineering works. To this

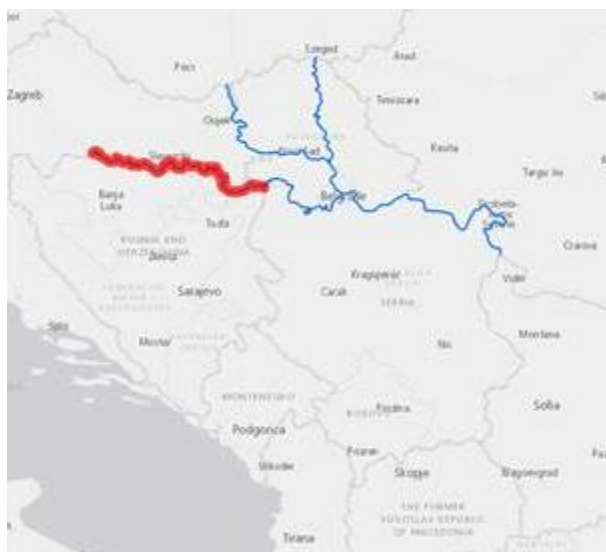
end, the next preparation considerations (as indicated in the WBIF Round 15 grant application) are: finishing the preparation of the necessary design and tender documentation for the civil works interventions to permit safe and efficient navigation on the section for the River Sava waterway from 179,7rkm to 234 rkm and thus introduce reliable vessel operations; completion of a full ESIA including an Environmental and Social Management Plan (ESMP) and an Environmental and Social Management Framework (ESMF).

Project benefits: Promoting the water transport, regional transport development between the ports on the river Sava. The investment in the fairway is designed to facilitate trade, regional integration and sustainable growth and thus have a positive impact on the broader economy of Bosnia and Herzegovina.

Project financing: Financial options yet unknown, though initial options include loan funding and potential investment co-financing (to total €20 million). To this aim, BiH applied for the WBIF grant (Round 15). The request of €860k include completion of ESIA study (€260k) and preparation of detail design and tender documentation (€600k). Also, Bosnia and Herzegovina received IPA 2010 grant funding (trust funds administered by the World Bank) for the preparation of the detailed design and the Environmental and Social Impact Assessment (ESIA) for the Sava River from the mouth of the river (river kilometer -rkm 0) at the confluence with the Danube river at Belgrade to Brčko (rkm 234); and for the demining of critical areas of the right bank of the Sava River in Bosnia and Herzegovina. However, the above IPA grant which preconditioned approval of the credit line, was cancelled (and consequently all contracts signed terminated) as Republic of Srpska entity revoked its commitment.

Project associated risks: The main risk being potential lack of a political willingness necessary for project implementation; Cross-boundary coordination issues

4.3.3 Demining of the Sava River right bank from the confluence of Drina river of the confluence of Una river



Type: IWW project
From/To: Donja Gradina to raca
Core Corridor: Rhina-Danube
Country: Bosnia and Herzegovina
Costs: €8 million

Project status: Beneficiary provided only the main design for demining. Although these activities are not a typical civil/construction works (meaning that they do not need to be elaborated by CD and PD etc.) they still need to be covered by a PFS and FS as they will generate a certain financial cost. Taking into account that a demining process is one of the preconditions for the Sava river watway improvement, it would be very practical to include a deminig costs into the Sava river waterway improvement costs and in such a way to update the existing studies for the Sava river waterway.

Project benefits: The key benefits are opening of the river bank for local communities, development of socio-economic activities along the river bank and securing river to be safe for navigation.

Project financing: BiH applied for an IPA grant together with the WB loan funds for demining activities (the grant implementation preconditioned loan agreement with WB). However, the above grant, and consequently WB financing, was cancelled. Hence, financial options yet unknown

Project associated risks: The main risk is a potential lack of political will related to financial borrowing in order to implement the Sava river waterway improvement which directly related to deminig activities.

5. Electricity

5.1 Gap analysis

5.1.1 Regional connectivity projects

The scoping phase was used to develop a list of Regional Connectivity Projects using the following sources (in chronological order):

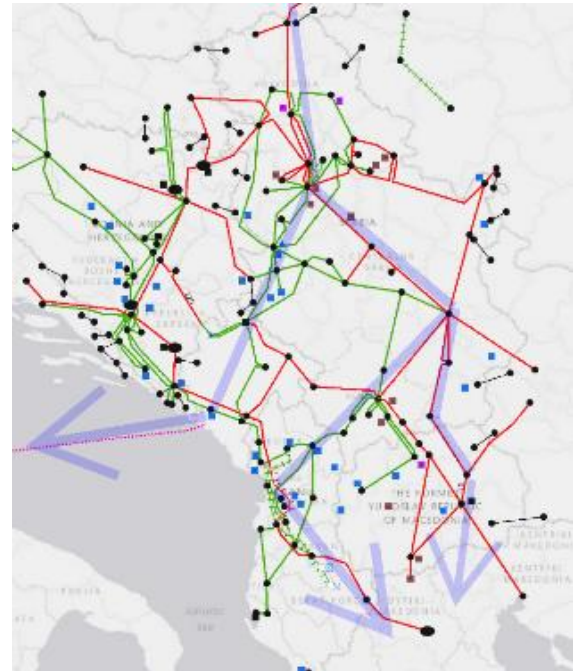
- **ECS Peci 2013.** The first common comprehensive assessment of the priority energy infrastructure projects for the SEE region, prepared using technical criteria, project maturity, RES facilitation impact and cost benefit analysis.
- **ENTSO-E TYNDP 2014.** The currently valid list of transmission network infrastructure development projects nominated and agreed by the TSOs that are members of ENTSO-E. Cross-border transmission infrastructure projects in ENTSO-E TYNDP 2014 are supported by both interconnected TSOs and the list complies with the requirement of Regulation EC 714/2009 to develop and adopt a non-binding Community-wide Ten Year Network Development Plan (TYNDP) every two years.
- **EU PCI 2015.** The latest and currently valid list of transmission network infrastructure development projects nominated and agreed at the EU level. According to EU Regulation these lists are developed/updated every two years: first list was developed in 2013, current one in 2015 and following list is due in 2017.
- **ENTSO-E Regional Investment Plan 2015 Continental South East region.** The CSE Regional Investment Plan 2015 produced the list of the projects to be assessed by ENTSO-E as part of the TYNDP2016 process, as well as the list of projects that have impact on the region but are not of pan-European significance.
- **Priority interconnection projects for financing and implementation under IPA 2015.** Priority electricity transmission infrastructure projects for financing and implementation under IPA 2015 have been listed in Annex 1 of the joint statement from the Western Balkan Energy Ministerial conference “Connecting systems, connecting markets”, held in Vienna on July 2nd, 2015.
- **Single pipeline project lists issued by individual WB6 countries.** The single project pipelines have been prepared by each country as part of the new IPA II process, approved by the National Investment Committees, and were submitted in December 2015.

This inventory identified some 29 regional connectivity projects.

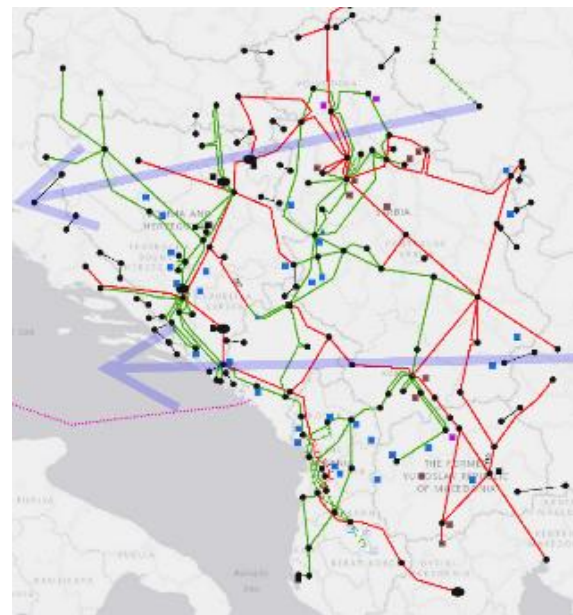
5.1.2 Gaps in transfer corridors

The predominant power flow directions in the region were analysed in order to identify those projects that need to be undertaken in order to improve connectivity along main electricity transmission corridors. According to the Regional Investment Plan 2015 for Continental South East (CSE) and ENTSO-E TYNDP 2014, main electricity transfer high-voltage network corridors are:

1. Corridor North – South (in TYNDP identified as North East – South West) which in Serbia splits into two corridors:
 - a) Hungary – Greece over Serbia, the former Yugoslav Republic of Macedonia and Albania, and
 - b) Hungary – Italy, over Serbia and Montenegro, with important branch to BiH.



2. Corridor East – West which in Serbia splits into two corridors:
 - a) Existing corridor Mid-Continental East (from Romania via Serbia and BiH to Croatia), and
 - b) Future corridor East-West from Turkey and Bulgaria via West Balkans to Italy.



The predominant power flow directions in the region are direction from East to West (E->W) and direction from North to South (N->S), but this is not crucial for identification of gaps in the infrastructure. These corridors are illustrated on Figure 5.1.

The status of the individual corridors is as follows:

- Corridor 1a is completed with the recent energizing of the 400kV OHL between Serbia and the former Yugoslav Republic of Macedonia. It may require some reinforcement in the future, but for the time being, the completion of the project Tirana (ALB) – Prishtina (Kosovo) which is under construction, and the Bitola (the former Yugoslav Republic of Macedonia) – Elbasan (ALB) line which is in an advanced preparation stage are sufficient to fill in all existing and potential gaps.
- Corridor 1b has number of gaps along its route. The missing sections are:
 - New 400kV OHLs Bajina Basta (SER) – Plevlja (MNE) or Bajina Basta (SER) – Visegrad (BiH) – Pljevlja (MNE); for these projects feasibility study is successfully completed,
 - New 400kV OHL Lastva - Pljevlja (MNE), under construction,
 - New substation 400/110kV Lastva (under construction),
 - New submarine cable Villanova (IT) – Lastva (MNE), close to construction,
 - Upgrading of existing 220kV OHL Obrenovac – Bajina Basta (SER) to 400kV, and
 - Upgrading of existing 220kV S/S Bajina Basta to 400kV.
- Corridor 2a, in order to be completed, needs a new interconnection between Serbia and Romania, the 400kV OHL Pancevo (SER) – Resita (RO) where construction has practically started. Full capacity along this corridor may be achieved only upon complete upgrade of the existing 220kV transmission grid in the Romanian part of Banat close to the Serbian border, also close to the Hungarian border and linking the existing 400kV interconnection between Hungary and Romania.
- Corridor 2b upgrading is a long term development plan. It includes numerous projects outside of the WB6 region, as well as a new interconnection between Serbia and Bulgaria,

From this desktop/map analysis it is obvious that transmission network in Serbia (with its cross-border interconnections with eight countries) is crucial for regional connectivity improvement. From that point of view, two internal projects became developments of regional interest, due to their contribution to increased capacity along main electricity transfer corridors. These projects are:

- (i) Upgrading of the existing 220kV transmission network in Central Serbia to 400kV, and
- (ii) Closing of the 400kV OHL loop around city of Belgrade.

From the above it is obvious that corridors 1b (North-South, i.e. Hungary – Italy, via Serbia, Montenegro and BiH, and 2a (East-West, i.e. Mid-Continental East (from Romania over Serbia and BiH to Croatia) are development areas where major contribution to regional connectivity may be achieved.

5.1.3 EC SEE PECEI 2016

Since 2013, in addition to the list of PCI projects prepared for EU member states, there has been a list of energy projects developed by the Energy Community Secretariat which are deemed to be of Energy

Community interest (PECI list). The Energy Community covers the six countries of the Western Balkans, Moldova and Ukraine.

In Article 2, paragraph 1 of the Regulation (EU) 347/2013 for Energy Community it is defined that "energy infrastructure" means any physical equipment or facility under the energy infrastructure categories which is located within the Contracting Parties or linking Contracting Parties, or linking Contracting Parties and Member States".

The same Article 2, paragraph 4, defines that "project of Energy Community interest" means a project necessary to implement the energy infrastructure and which is part of the list of projects of Energy Community interest referred to in Article 3" of the same Regulation.

Annex I of the Regulation (EU) 347/2013 for Energy Community defines that priority infrastructure projects in the area of electricity transmission and storage are projects from the following categories:

- High-voltage lines (overhead lines for minimum 220 kV; and underground and submarine transmission cables, if they have been designed for a voltage of 150 kV or more);
- Electricity storage facilities, including pump storage;
- Any equipment for the safe, secure and efficient operation of the system;
- Any equipment or installation aiming at two-way digital communication.

Article 3 and Annex II of the Regulation (EU) 347/2013 of the Energy Community define the process of the EC SEE PECI 2016 List development. Based on these documents, the Energy Community Secretariat (ECS) launched an invitation for project promoters to submit their proposals that potentially fall into the categories mentioned above, to be assessed in order to be included in the list. Any project promoter, within or outside the Energy Community, is invited to submit candidate projects to be assessed within the scope of Regulation (EU) 347/2013 for Energy Community, if the projects meet the following general criteria:

- (a) The project falls in at least one of the energy infrastructure categories and area as described above;
- (b) The potential overall benefits of the project, assessed according to the respective specific criteria, outweigh its costs, including in the longer term; and
- (c) The project meets any of the following criteria:
 - Involves at least two Contracting Parties or a Contracting Party and a Member State by directly crossing the border of two or more Contracting Parties, or of one Contracting Party and one or more Member States;
 - Is located on the territory of one Contracting Party and has a significant cross-border impact as set out in Annex III.1 of the Regulation (EU) 347/2013 for Energy Community.

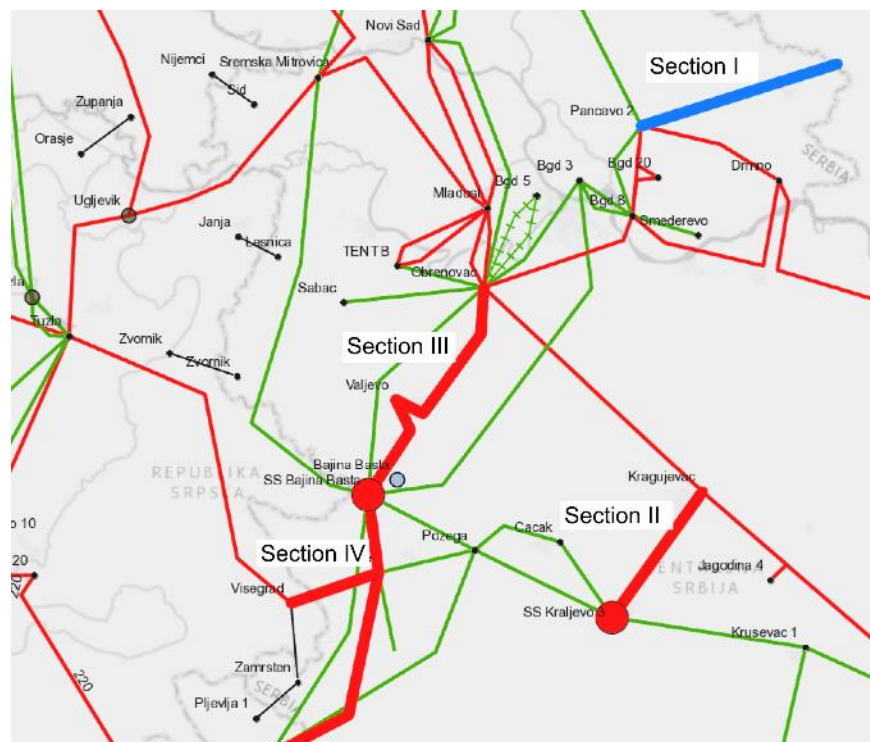
The submission of the EC SEE PECI 2016 projects closed in February just after the submission of the scoping report. The main difference compared to the EC SEE PECI 2013 exercise was that there were no generation projects involved, except for pumped storage, or oil pipeline projects. DG NEAR advised at the end of the scoping phase that the study phase work should be focussed on these EC SEE PECI 2016 projects. Some of the PECI submissions in fact contain multiple individual projects and when these are taken into account there are a total of 14 projects which have been taken forward to the study phase. The projects are listed in Table 5.1.

Table 5.1: Electricity transmission projects shortlisted for study phase

No.	Project ID	Project name	Country	Corridor
1	WB6.EN.E.07	400kV OHL Pančevo (RS) - Resita (RO) / SER part	SER	Trans Balkan Corridor (section in Serbia), Phase I
2	WB6.EN.E.02	400 kV OHL Kragujevac - Kraljevo (RS)	SER	
3	WB6.EN.E.03	Upgrade of the existing 220/110kV SS Kraljevo 3 (RS) to 400kV	SER	
4	WB6.EN.E.05	400kV OHL Bajina Bašta - Obrenovac (RS)	SER	
5	WB6.EN.E.06	Upgrade of the existing 220/110kV SS Bajina Bašta to 400kV	SER	
6	WB6.EN.E.01-1	400kV OHL Bajina Bašta (RS) - Višegrad (BA) - Pljevlja (ME) / SER part	SER	
7	WB6.EN.E.04	400 kV OHL Pljevlja - Lastva	MNE	Trans Balkan Corridor, section in Montenegro
8	WB6.EN.E.01-2	400kV OHL Bajina Bašta (RS) - Višegrad (BA) - Pljevlja (ME) / MNE part	MNE	
9	WB6.EN.E.01-3	400kV OHL Bajina Bašta (RS) - Višegrad (BA) - Pljevlja (ME) / BIH part	BIH	Trans Balkan Corridor, section in BiH
10	WB6.EN.E.12	400 kV OHL Tirana (AL) - Pristina (Kosovo)	ALB, KOS	CSE9 corridor
11	WB6.EN.E.11-1	400kV OHL Bitola (MK) - Elbasan (AL) / MKD part, including SS Ohrid	MKD	
12	WB6.EN.E.11-2	400kV OHL Bitola (MK) - Elbasan (AL) / ALB part	ALB	
13	WB6.EN.E.13	400kV OHL Banja Luka (BA) - Lika (HR) / BIH part	BIH	CSE 1 corridor
14	WB6.EN.E.20	400kV OHL Bajina Bašta - Kraljevo (RS)	SER	Trans Balkan Corridor, section in Serbia, phase II

5.2 Review of projects

5.2.1 Trans Balkan Corridor Phase I – section in Serbia



Type: 400kV OHL and associated substations

From/To: SS Resita (ROM) to SS Pljevlja (MNE)

Components:

- **Section I:** New single 400kV OHL Resita (ROM) - Pančevo (SER) / part in Serbia
- **Section II:** New 400kV OHL Kragujevac - Kraljevo (SER) & upgrade of existing 220kV/110kVSSKraljevo 3 to 400kV
- **Section III:** New double 400kV OHL Obrenovac – Bajina Bašta (SER) & upgrade of existing 220kV/35kVSSBajina Bašta to 400kV
- **Section IV:** New double 400kV OHL B. Bašta (SER) – Pljevlja (MNE)– Višegrad (BiH) / part in Serbia

Length: 325.8km

Costs: €162.4 million

Start: 2015

End: 2022

Project status: The Project is under development: Section I is under construction, Section II is close to the construction start, while Sections III and IV are in the preparation phase. Project is part of the pan-European ENTSO-E TYNDP2014, Regional Investment Plan 2015, Project of Energy Community Interest (PECI) 2013 and 2016, fully supported by the IPA II 2015, recognized as crucial project for regional and

pan-European connectivity. Section I of the project is part of the EU PCI - Project of Common Interest list for 2013 and 2015. Project is fully supported by Serbian Energy Regulatory Authority and Ministry of Mining and Energy. This is the only infrastructure project supported by the special legal act, known as “The Law⁴ on Trans-Balkan Corridor”.

Project benefits:

The project is of the highest strategic importance for pan-European connectivity of electricity transmission infrastructure. It is of strategic importance for the connectivity of the WB6 area, as well as for the establishment and facilitation of the regional electricity wholesale and balancing market. This project contributes to both reinforcement of interconnections between WB6 countries, and between WB6 countries and adjacent EU Member States. It brings additional stability of power system operations in the region and improves security of electricity supply to final consumers. Establishment of the Trans-Balkan Corridor enables the full utilization of the HVDC submarine interconnection between Montenegro and Serbia, as well as enabling the currently foreseen generation development in the WB6 area, both from conventional and from renewable energy sources.

Project financing:

Proposed financing structure for the Trans-Balkan Corridor in Serbia, for all works included in sections I, III and IV, according to the GAF submitted to WBIF, is as follows: 50 m€ EBRD loan, 49.3 m€ application for WBIF grant and 35.1 m€ of EMS equity proceeds. On top of that, there is a WBIF grant of 1.6 mil.€ (2 times 0.8mil.€) already approved for development of detailed technical documentation for Section III and Section IV of the project. In this application, EMS considers its investment in Section I as part of their share of the overall investment.

For Section II, the financing structure is already agreed and approved and assumes loan of 14.27 mil.€ (KfW), grant of 6.6 mil.€ (IPA II 2015, including TA) and remaining costs of 7.13 mil.€ covered by EMS equity proceeds.

Project associated risks:

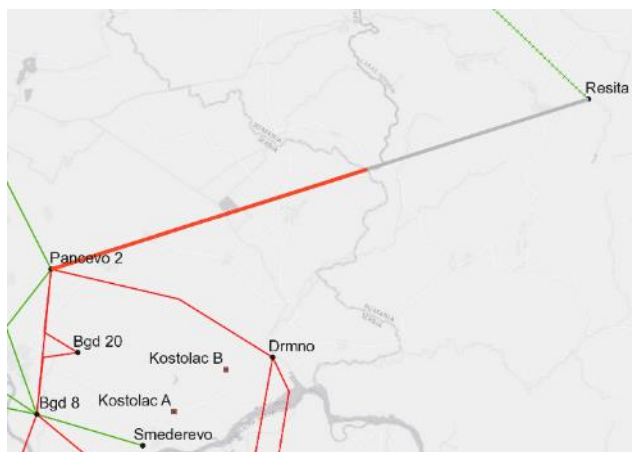
This project is extremely complex and accordingly there may be associated risks that are usually associated with the development of major infrastructure projects of similar scales. However, all the risks arising from legal, organisational, spatial, ESIA or technical issues are predictable and project developer, Serbian TSO (EMS), is working on their mitigation. The only major risk which is out of EMS's reach is the financing of this major development project. Although the project contains a number of interconnections with other power systems, the only critical parts are sections in Serbia, simply because the overall financial burden for this huge development is too high for EMS. In addition, there is a serious concern of the Serbian Energy Regulatory Authority who question if the electricity consumers in Serbia are able to sustain the significant tariff increase necessary to provide a return on investments into this electricity transmission infrastructure of regional interest and benefit.

Expected development:

Under the condition that planned financing scheme is approved, meaning that project execution may proceed in accordance with the current planning, the entire project will be completed, at the latest, by the end of the year 2022. In the event that the financing is delayed, the sequence of construction may be changed and deadlines seriously jeopardised.

⁴Law for establishment of public interest and special procedure for expropriation and provision of documentation for the implementation of projects of 400kV transmission system facilities within Transbalkan Corridor - first phase"

5.2.1.1 Section I: OHL Pančevo (SER) - Resita (ROM), section in Serbia



Type: New 400kV OHL and associated substations

From/To: SS Pančevo (SER) - SS Resita (ROM)

Components: New 400kV OHL Pančevo (SER) - ROM border

Length: 68km in SER (total length 131km)

Costs: Not available (part of the EMS share in TBC financing)

Start: Q4/2015(SER); Q2/2015 (ROM)

End: Q4/2017

Project status: Project is under construction. This sub-projects the only WB6 project which is a part of EU PCI - Project of Common Interest 2015. The project is important part of the Trans Balkan North-South corridor, linking Central Europe with Italy over the HVDC submarine cable, and also part of the Mid-Continental East corridor according to the PCI and ENTSO-E classification. The project is listed as a Project of Energy Community Interest (PECI 2013 and 2016), as well as part of the ENTSO-E TYNDP 2014 and CSE Regional Investment Plan 2015.

Project benefits:

The project is of the highest strategic importance for connectivity of electricity transmission infrastructure, being part of the two main regional pan-European electricity transmission corridors, north-south and east-west. The project is also of strategic importance for the connectivity of the WB6 area, as well as for the establishment and facilitation of the regional electricity wholesale and balancing market.

Project financing:

Financing of this project is part of the overall financing structure for the Trans-Balkan Corridor Phase I (see 5.2.1 above). In their GAF application EMS considered this investment as part of their contribution to the overall financing of the Trans-Balkan Corridor – Phase I.

Project associated risks:

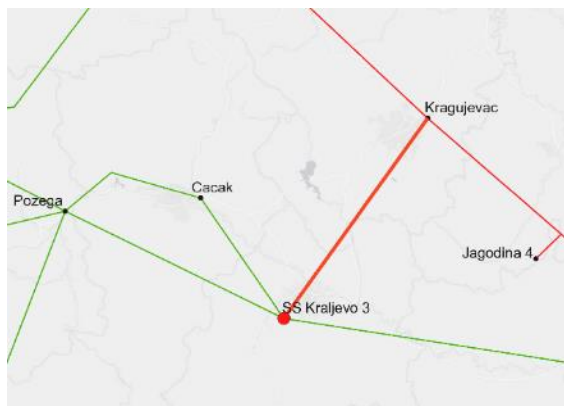
There are no major risks recognised so far associated to the execution of this project. The section of the OHL and substation in Romania are under construction. The works are slightly more advanced compared to the section in Serbia. EMS and Transelectrica are regularly coordinating and synchronising all activities.

Expected development:

SER part: Construction of the Serbian part of the OHL is planned to be completed by 11/2017.

ROM part: Romanian part of the project, in addition to the new 400kV OHL from border with Serbia to SS Resita (ROM), consists also of upgrade of the existing 220kV SS Resita to 400kV, upgrade of the existing 220kV OHL Portille de Fier-Resita (ROM) to 400kV, and upgrade of the existing 220kV OHL Resita-Arad-Timisoara (ROM) to 400kV. Construction works for the 400kV OHL from border with Serbia to SS Resita (ROM) should be completed by Q4/2017, and upgrade of the existing 220kV SS Resita to 400kV should be completed by Q4/2016.

5.2.1.2 Section II: OHL Kragujevac - Kraljevo (SER)



Type: New 400kV OHL and associated substations

From/To: Kragujevac - SS Kraljevo (SER)

Components: New 400kV OHL Kragujevac - Kraljevo (SER) & upgrade of existing 220kV/110kV SS Kraljevo to 400kV

Length: 59.3 km

Costs: €28 million

Start: Q3/2017

End: Q3/2019

Project status: The project represents Section II of the Trans Balkan North-South corridor. Also, it is listed as a Project of Energy Community Interest (PECI 2013 and 2016), and part of the ENTSO-E TYNDP 2014 and CSE Regional Investment Plan 2015. The project is part of the Serbian Energy Strategy, National TYNDP and it is fully supported by the Serbian Energy Regulatory Authority and Ministry of Mining and Energy.

Project benefits: As part of the Trans-Balkan Corridor, the project is of the highest strategic importance for pan-European connectivity of electricity transmission infrastructure. The project is also of strategic importance for the connectivity of the WB6 area, as well as for the establishment and facilitation of the regional electricity wholesale and balancing market. The project is essential to be completed first to provide the technical system resilience for the other Trans-Balkan corridor projects to proceed.

Project financing:

Since this is the first section of the Trans-Balkan Corridor to be constructed, financing of this Section II is not included in the overall financing scheme for the Trans-Balkan Corridor – Phase I presented in the 5.2.1 above. Financing structure for this project has been completed. KfW is leading IFI for this project with the loan of 14.27 mil.€. The project received IPA II 2015 grant of 6.6 mil.€ that includes technical assistance for project documentation. Remaining funds of 7.13 mil.€ will be provided by EMS.

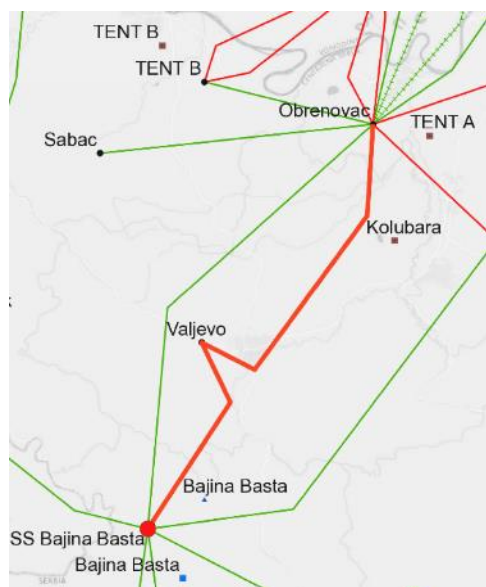
Project associated risks:

There were no major risks recognised so far associated to the execution of this project. Since financing of this project has been agreed, and project execution should start earlier, this project does not share uncertainties and risks associated with the financing of the remaining sections of the Trans-Balkan Corridor – Phase I.

Expected development:

Detailed design documentation is due to be completed by the end of 2016, followed by the permitting process and preparation of tender documentation by Q1/2017. Construction permit is expected to be obtained by the end of Q2/2017. Construction of the OHL is planned to start in Q3/2017 and to end in Q3/2019. Upgrading of the SS Kraljevo is due to begin in Q3/2017 and to end in Q1/2019.

5.2.1.3 Section III: OHL Obrenovac–Bajina Bašta (SER)



Type: New double 400kV OHL and associated substations

From/To: SS Obrenovac – SS Bajina Bašta (SER)

Components: New 400kV OHL Obrenovac-Bajina Bašta (SER)

Upgrade of existing 220kV/35kVSS Bajina Bašta to 400kV

Length: 115 km

Costs: Estimated at €62.7million (€51.6 million OHL and €11.2 million SS)

Start: Q3/2018

End: Q3/2020 for SS and Q3/2021 for OHL

Project status: Project is in the ENTSO-E TYNDP and ECS PECEI list (2013 list and 2016 nominations). Pre-Feasibility Study and Conceptual Design have been completed.

Feasibility Study with Cost-Benefit Analysis (CBA) has been completed. Preliminary Design and additional ESIA are in progress. Permitting process has not started yet. Project is Section III of the Trans-Balkan Corridor - Phase I and is supported by all national authorities including special Law on Trans Balkan Corridor.

Project benefits:

The project is of the highest strategic importance for pan-European connectivity of electricity transmission infrastructure. It is of strategic importance for the connectivity of the WB6 area, as well as for the establishment and facilitation of the regional electricity wholesale and balancing market. This project will enable full utilization of the submarine HVDC cable between Montenegro and Italy. On top of that, by connecting two major generation nodes in Serbia and in the region as well (TPP Nikola Tesla with over 2500MW installed TPPs and hydro power system Bajina Bašta with 1000MW installed, out of which 600MW pump storage), this project is of huge importance for improvement of security of supply in the area, as well as for optimal use of energy by better utilization of pump storages.

Project financing:

Financing of this project is part of the overall financing structure for the Trans-Balkan Corridor Phase I (see 5.2.1 above). Development of the detailed technical documentation is supported by a WBIF grant that still needs to be implemented.

Project associated risks:

There are no risks associated with the project preparation and actual construction. The only foreseeable constraint may be financing issue, already explained in the 5.2.1 above for the entire Trans-Balkan Corridor – Phase I project, section in Serbia.

Expected development:

Preliminary Design and ESIA are due in early 2017. Detailed design should be completed by early 2018. Construction of the OHL is planned to start in Q3/2018 and to end in Q3/2021. Upgrading of the SS Bajina Bašta is due to begin in Q3/2018 and to end in Q3/2020. Land acquisition will be resolved during the early stage of the construction period.



5.2.1.4 Section IV: OHL Bajina Bašta (SER) – Border with MNE – Border with BiH

Type: New double 400kV OHL

From/To: SS Bajina Bašta (SER) to Border with MNE and to border with BiH

Components: New 400kV OHL Bajina Bašta (SER) – MNE border- BiH border

Length: 83.5km

Costs: Part of total TBC - Phase I costs, estimated at €47.8 million

Start: Q3/2020

End: Q2/2022

Project status: Project is in the ENTSO-E TYNDP and ECS PEI list (2013 list and 2016 nominations). Feasibility Study with Cost-Benefit Analysis (CBA) has been completed.

Preliminary Design and additional ESIA are in progress. Permitting process has not started yet. Project is Section IV of the Trans-Balkan Corridor - Phase I, and is supported by all national authorities including special Law on Trans Balkan Corridor.

Project benefits:

The project is of the highest strategic importance for pan-European connectivity of electricity transmission infrastructure. It is of strategic importance for the connectivity of the WB6 area, as well as for the establishment and facilitation of the regional electricity wholesale and balancing market. This project will enable full utilization of the submarine HVDC cable between Montenegro and Italy.

Project financing:

Financing of this project is part of the overall financing structure for the Trans-Balkan Corridor Phase I (see 5.2.1 above). Development of the detailed technical documentation is supported by the WBIF/EBRD grant due to be activated with tender for the Consultant in Q3/2016.

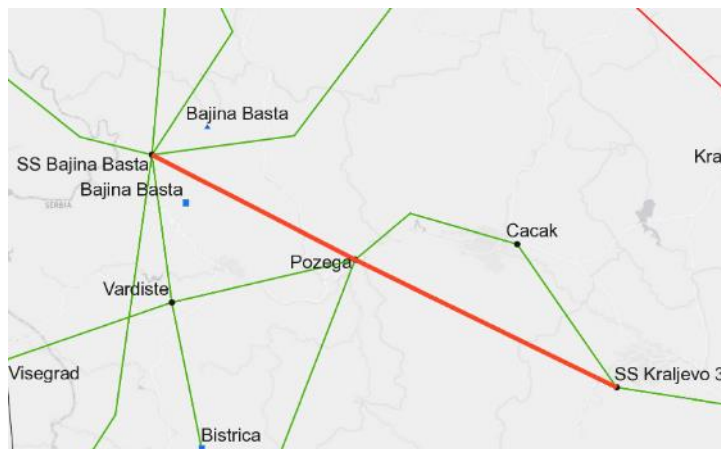
Project associated risks:

There are no risks associated with the project preparation and actual construction. The only foreseeable constraint may be financing issue, due to the fact that numerous development projects of regional and pan-European significance, on top of regular development and maintenance costs associated with the internal transmission network in Serbia, present extremely high financial burden and risk for EMS in the years to come (EMS declared that without strong support from EU and IFIs the works on this interconnection may be seriously delayed).

Expected development:

Detailed technical documentation is due to be completed by the end of 2017, followed by the land acquisition process. Construction of the OHL is planned to start in Q3/2019 and to end in Q2/2022.

5.2.2 Project WB6.EN.E.20: Bajina Bašta – Kraljevo (SER)



Type: New 400kV OHL

From/To: SS Bajina Bašta – SS Kraljevo 3 (SER)

Components: 400kV OHL Bajina Bašta – Kraljevo (SER)

Length: Estimated at 150 km

Costs: Estimated at €65 million

Start: 2025

End: 2028

Project status: The project is part of the

Trans-Balkan Corridor, Phase II, it is in the ENTSO-E Regional plan 2015 and ECS PEI 2016 nominations. The Feasibility Study with ESIA and Preliminary Design are currently on-going. This is long-term project, supported by the Serbian Ministry of Mining and Energy and Serbian Energy Regulatory Authority (AERS).

Project benefits:

This project is the first phase of the central Serbia electricity transmission system upgrade from 220 kV to 400 kV voltage level aimed to replace aging 220kV network which runs through the densely populated area. It should contribute to decrease of network losses and increase of technical resilience during the operation and maintenance of the network in the region.

Project financing:

Project financing has not been assessed yet. It is expected that after the Feasibility Study with Preliminary Design is completed and approved, the financing issue will be opened. Since this is a long-term project this issue is not critical for project development.

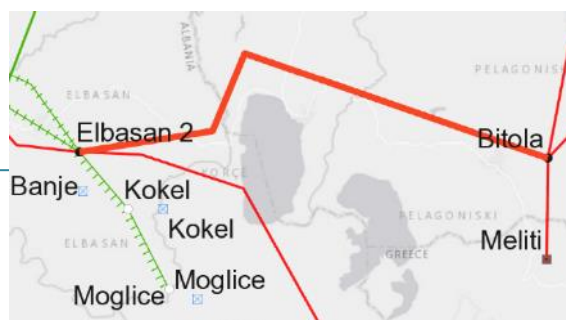
Project associated risks:

So far it was not possible to identify any major risk associated to this project.

Expected development:

The feasibility Study with ESIA and Preliminary Design are planned to be completed by 2017. Planning process and obtaining of necessary documentation is due by 2019. Detailed design and tender documentation should be ready by 2022, followed by the land acquisition planned to be completed by 2024. The construction permit is foreseen to be obtained in 2025. OHL construction should start in 2025 and finish in 2028.

5.2.3 Project WB6.EN.E.11: Bitola (MKD) – Elbasan (ALB)



Type: New 400kV OHL and associated substation

From/To: SS Bitola (MKD) - SS Elbasan (ALB)

Components:

- New 400kV OHL Bitola (MKD) – Elbasan (ALB)
- New 400/110kV SS Ohrid (MKD)
- Compensation equipment in SS Elbasan

Length: 151 km (95km in MKD and 56km in ALB)

Costs: €72.1 million (€42 million in MKD and €28.6million in ALB)

Start: Q3/2017 (MKD); Q2/2018 (ALB)

End: Q2/2020

Project status: Project is in the ENTSO-E TYNDP and ECS PECL list (2013 list and 2016 nominations)

MKD part: Feasibility Study, including ESIA, and Preliminary Design have been completed. ESIA from Feasibility Study has been updated and approved, as a pre-condition for financing arrangements. Project is supported by the Ministry of Economy (Energy Department) and National Energy Regulatory Commission. Consultant for development of the Main Design and Tender Documentation has been selected. Border point of OHL connection with OST has been determined and agreed.

ALB part: Feasibility Study, including ESIA, and Preliminary Design have been completed. ESIA from Feasibility Study needs to be updated and Environmental Declaration obtained. Border point of OHL connection with MEPSO has been determined and agreed. Project is supported by the Albanian Government and National Energy Regulatory Commission. Procedure for selection of the Consultant for development of the Main Design and Tender Documentation, as well as for construction supervision has started.

Project benefits:

This project is part of the CSE9 corridor, developed to increase the transfer capacity in the predominant North-South direction from Romania, Serbia and Bulgaria towards Greece, the former Yugoslav Republic of Macedonia and Albania. At the same time, this new 400 kV interconnection is part of the East – West electricity transmission corridor between Bulgaria, the former Yugoslav Republic of Macedonia, Albania and potentially Italy, which improves connection of the Albanian power system with the rest of the regional interconnected network. By closing the 400 kV ring between Albania, the former Yugoslav Republic of Macedonia and Greece, the security of electricity supply in the South-West part of the region is expected to increase.

This project provides improvement of the reliability of the regional electricity transmission network, and supports creation and facilitation of the regional electricity wholesale and balancing market. With this project, purely hydro power based generation facilities in the Albanian power system will get an opportunity to improve their efficiency combined with complementary predominantly thermal power systems in the former Yugoslav Republic of Macedonia and Kosovo.

Project financing:

MKD part: Financing structure for the project has been completed. EBRD is leading IFI for this project. Main financing source is 37 mil.€ corporate loan by EBRD, agreement has been signed in December 2015. Project preparation and supervision activities will be financed by the IPA II grants (from EU-DG ENLARG and EBRD) with total value of 12 mil.€.

ALB part: Financing structure for the project is progressing but it has not been completed. KfW is leading IFI for this project - 37 mil.€ loan has been agreed but sovereign guarantee has not been signed yet. OST applied for IPA II 2016 grant of 14 mil.€ (this grant is planned for financing support of this project and of the project Elbasan-Fieri). OST will support development of both projects with 5 mil.€ of own funds. Additional grants have been approved for the development of detailed design by WBIF (600k€) and by KfW (600k€).

Project associated risks:

MKD part: There were no major risks recognised so far associated to the execution of the remaining activities for preparation and construction of the facilities which are part of this project. Land acquisition is not a precondition for the construction permit, so it will be done during the construction (section by section, following land acquisition progress). Project documentation is being developed based on the 500m wide corridor approved through the national spatial plan of the former Yugoslav Republic of Macedonia, which allows certain flexibility for selection of the tower locations. Changes in effective legislation that may have impact on project execution are not expected.

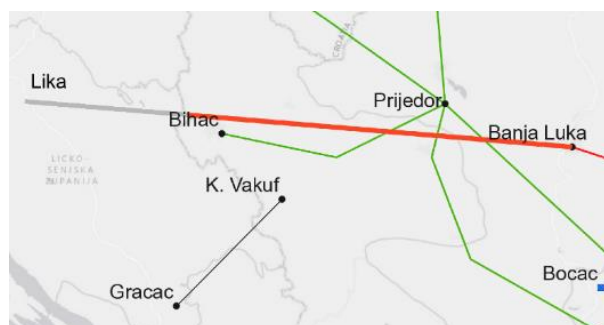
ALB part: Concerning risks associated to the execution of the remaining activities for preparation and execution of this project, for most of them is still early to develop any clear conclusion. Practically there were no activities after the Feasibility Study and the Preliminary Design have been completed. Effective legislation provides partly efficient framework for further project activities, and no important changes are expected. The only recognised risk is relatively low prices for compensation of land acquisition (limited by the Law) which prevent OST to pay proper compensation to affected land owners and may cause time consuming procedures.

Expected development:

MKD part: PIU Consultant is expected to be appointed by Q3/2016. Detailed design and tender documentation should be ready by Q2/2017. The earliest completion of all substation and OHL works, without any delays taken into account, is early 2020.

ALB part: Signing of the loan agreement and approval of grants are foreseen by the end of Q2/2016. Consultant should be appointed by the end of Q3/2016. Update of the ESIA study should be completed by the end of 2016. Contractor should be appointed by Q2/2017. Environmental Declaration and Construction Permit should be obtained in the Q3/2017. Construction works should start in Q3/2017 and end, without potential delays, in Q2/2020.

5.2.4 Project WB6.EN.E.13: Banja Luka (BiH) – Lika (CRO)



Type: New 400kV OHL, upgrade of existing 220kV OHLs to 400kV, and associated substation

From/To: SS Banja Luka 6 (BiH) - SS Lika (CRO)

Components:

- New 400kV OHL Banja Luka (BiH) – Lika (CRO)
- New 400/110kV SS Lika (CRO)
- Upgrade of existing 220kV OHL Brinje-Velebit - Konjsko (CRO) to 400kV (215km)
- Upgrade of existing 220kV SS Brinje to 400kV

Length: Estimated 155 km (110km in BiH and 45km in CRO)

Costs: To Be Determined

Start: To Be Determined

End: To Be Determined

Project status: Project is in the ENTSO-E TYNDP and ECS PECL list (2013 list and 2016 nominations)

BiH part: Project is part of the approved 10-Year Network Development Plan for the BiH transmission network. Tender for the Feasibility Study and Preliminary Design has been published.

CRO part: Project is part of the approved 10-Year Network Development Plan for the Croatian transmission network. Tender for the Feasibility Study and Preliminary Design has been published.

Project benefits:

This project is of significant importance for the stakeholders and will significantly increase cross-border electricity transmission capacity between BiH and Croatia and strengthen regional East-West corridor. Last but not least, the project should support electricity market development and facilitation, and RES integration in the South and Mid Croatia, as well as North and Mid BiH.

Project financing:

No financing has been agreed so far. The Feasibility Study and Preliminary Design are financed by EBRD grant through the WBIF framework.

Project associated risks:

The Feasibility Study is supposed to identify project development risks. The only constraint recognised at this point is explicit statement of the HOPS (Croatian TSO) that development of the internal lines and substations in Croatia is precondition for the interconnection Banja Luka (BiH) – Lika (CRO). Croatia is leading the development of the Feasibility Study for both countries.

Expected development:

According to the data from PECL 2016 nominations, the Feasibility Study, Preliminary Design and preliminary investment decision should be completed by the end of 2019. Permitting process should be completed by the end of 2022. Tendering and Main Design should be done during 2023 and 2024, followed by the construction between 2025 and 2029. Commissioning and energising is foreseen in early 2030.

5.2.5 Project WB6.EN.E.01-3: Višegrad (BiH) – Border with Serbia



Type: Upgrade of existing 220kV OHL to 400kV

From/To: SS Višegrad – border with Serbia

Components: Upgrade of existing 220kV OHL from SS Višegrad to the border with Serbia

Length: 17.3 km

Costs: Estimated at €9 million

Start: 2020

End: 2022

Project status: The project is part of the CSE8 Trans-Balkan Corridor, it is in the ENTSO-E TYNDP, Regional Investment Plan for 2015, as well as part of the Energy Community's PECl list (2013 list and 2016 nominations).

The Pre-Feasibility assessment and Conceptual Design, as well as the Feasibility Study, including CBA, and ESIA package have been completed. Works on the design documentation is planned to start soon, subject to utilisation of the WBIF grant and status of BiH

concerning this support⁵. Project is part of the approved 10-Year Network Development Plan for the BiH transmission network and fully supported by State Electricity Regulatory Commission (SERC).

Project benefits:

This project is of significant importance for the entire pan-European interconnection. It is part of the CSE8 Trans-Balkan Corridor and at the same time part of the regional East-West electricity transmission corridor. By increasing cross-border electricity transmission capacity between BiH, Montenegro and Serbia, the project strongly supports electricity market development and facilitation. The project supports the full utilization of the submarine cable interconnection between MNE and Italy.

Project financing:

No financing has been agreed so far for this project. BiH institutions cannot apply for financing at this point, but having in mind importance of the project and relatively small investment comparing to other partners, Elektroprenos BiH is considering the possibility of financing from its own funds.

Project associated risks:

Since this is a part of the common project that involves three parties (SER, MNE and BiH), where section in Serbia is the longest and the most complex, project progress is fully dependent on the development of the OHL section in Serbia. Concerning project in BiH, land acquisition process may become very time consuming according to the previous experience of Elektroprenos BiH.

Expected development:

Progress of this section in BiH is supposed to follow and be synchronized with the activities in SER concerning that part of the OHL interconnection. Detailed documentation development is foreseen to be completed by 2018, and land acquisition by the end of 2019. Construction works should start in 2020 and

⁵ BiH has been exempted from this support scheme due to the delay in compliance with Energy Community soft measures.

complete

in

2022.

5.2.6 Trans Balkan Corridor, section in Montenegro:

Project WB6.EN.E.04: Lastva – Pljevlja (MNE)

Project WB6.EN.E.01-2: Pljevlja – Border with SER



Type: New 400kV OHL and associated substation

From/To: SS Lastva - SS Pljevlja 2 (MNE) –border with Serbia

Components:

- New double 400kV OHL Lastva – Čevo (MNE)
- New single 400kV OHL Čevo– Pljevlja (MNE)
- New 400/110kV SS Lastva
- New 400kV OHL Pljevlja (MNE) – border with SER

Length: 166.8 km

Costs: €130.5 million

Start: 2015

End: 2022

Project status: All components with exception of 400kV OHL Pljevlja –border with Serbia are under construction. This project is in the ENTSO-E TYNDP and ECS PECEI list (2013 list and 2016

nominations).

For the components under construction, all required technical documentation and procedural issues necessary for obtaining of construction permit were completed. The Main Design is developed by the appointed Contractors. The project is supported by the Ministry of Economy (Energy Department) and National Energy Regulatory Commission. Construction works for SS Lastva and OHL section Lastva-Čevo are on-going.

For the 400kV OHL Pljevlja – border with Serbia, the Feasibility Study, including ESIA, is completed. Works on the design and tender documentation is planned to start soon, subject to utilisation of the WBIF grant.

Project benefits:

This project is part of the main pan-European and regional North-South electricity transmission corridor, linking central Europe with Italy over the submarine cable. Together with projects in Serbia along the same corridor, it is the only missing component to complete this major power transit route. In addition to high importance for the power system of Montenegro, this project also strengthens regional connections to Serbia, BiH, Kosovo and Albania, providing further support for regional electricity market development and facilitation of its operations.

Project financing:

The financing structure for the project has been completed. EBRD is leading IFI for this project, while KfW is the loan IFI for the €25 million loan. Project preparation was previously supported by WBIF grant of €3.5 million. Project execution will be supported by the 2015 EU Pre-Accession support (IPA II) grant with total value of 25 mil.€. Finally, the Montenegrin TSO (CGES) participates with €17 million of own funds.

Project associated risks:

There were no major risks recognised so far associated to the execution of this project. The only reason for potential construction delay may be unpredictable weather conditions (causing relatively short construction season) and severe terrain in significant part of the OHL route.

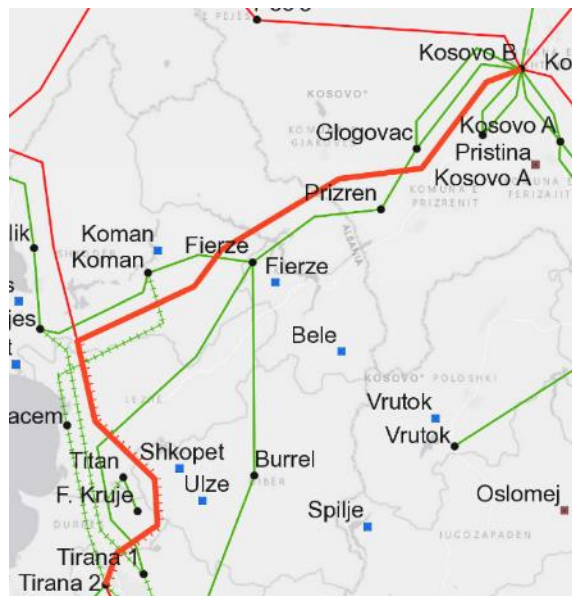
For the 400kV OHL section from Pljevlja to the border with Serbia, the critical issues are implementation synchronization with the activities with Serbia and fact that the pre-condition for construction is dismantling of existing 220kV line between Bajina Bašta (SER) and Pljevlja (MNE). The duration of the missing link between two substations needs to be minimized.

Expected development:

The components under construction should be commissioned by 2020.

For the 400kV OHL section from Pljevlja to border with Serbia, progress is planned to follow and be synchronized with the activities in Serbia, concerning their parts of the OHL interconnection. Preliminary design (according to local legislation) and tender documentation should be ready by Q2/2017. Land acquisition should be completed during 2017 and 2018. Progress of construction shall be synchronized with the section in Serbia and the estimated commissioning is 2022.

5.2.7 Project WB6.EN.E.12: Tirana (ALB) – Prishtina (KOS)



Type: New single 400kV OHL

From/To: SS Tirana (ALB) - SS Prishtina (KOS)

Components: New 400kV OHL Tirana (ALB) – Prishtina (KOS)

Length: 242 km (130km in ALB and 112km in KOS)

Costs: €84.9 million

Start: 2014

End: June 2016

Project status: Project is under construction.

Project benefits: This project provides improvement of the reliability of the regional electricity transmission network, and supports creation and facilitation of the regional electricity wholesale and balancing market. With this project, purely hydro power based generation

facilities in the Albanian power system will get an opportunity to improve their operational efficiency when combined with complementary predominantly thermal power systems in the former Yugoslav Republic of Macedonia and Kosovo.

Expected development: Construction of the OHL section in Kosovo, from Prishtina to the border with Albania was completed at the end of 2015. The section of the OHL in Albania will be completed by May 2016. Energising of the OHL is expected in early June 2016.

5.3 Overview

The review of the projects is summarised in the Table 5.2 below in which the estimated investment cost of each project, present status and project maturity (low, medium, high) are presented. The maturity contains also information on the status of financing and those projects being both mature and needing co-financing are highlighted in red.

Table 5.2: Status and maturity of electricity projects reviewed

No.	Project name	Country	Corridor	Investment cost (€million)	Present status	Project maturity
1	400kV OHL Pančevo (RS) - Resita (RO) / SER part	SER	Trans Balkan Corridor (section in Serbia), Phase I	N/A	Under construction	N/A
2	400 kV OHL Kragujevac - Kraljevo (RS)	SER		18.9	Detailed design and permitting	High maturity and financing agreed
3	Upgrade of the existing 220/110kV SS Kraljevo 3 (RS) to 400kV	SER		9.1	Detailed design and permitting	High maturity and financing agreed
4	400kV OHL Bajina Bašta - Obrenovac (RS)	SER		51.6	Preliminary design / EIA finalisation and spatial planning	High maturity
5	Upgrade of the existing 220/110kV SS Bajina Bašta to 400kV	SER		11.2	Preliminary design / EIA finalisation and spatial planning	High maturity
6	400kV OHL Bajina Bašta (RS) - Višegrad (BA) - Pljevlja (ME) / SER part	SER		47.1	Spatial planning and Detailed design to be initiated	High maturity
7	400 kV OHL Pljevlja - Lastva	MNE	Trans Balkan Corridor, section in Montenegro	N/A	Under construction	N/A
8	400kV OHL Bajina Bašta (RS) - Višegrad (BA) - Pljevlja (ME) / MNE part	MNE		6.6	Preliminary design / EIA finalisation	High maturity and financing agreed (grant approved)
9	400kV OHL Bajina Bašta (RS) - Višegrad (BA) - Pljevlja (ME) / BIH part	BIH	Trans Balkan Corridor, section in BiH	8.0	Preliminary design / EIA finalisation	High maturity
10	400 kV OHL Tirana (AL) - Pristina (Kosovo)	ALB, KOS	CSE9 corridor	N/A	Under construction	N/A
11	400kV OHL Bitola (MK) - Elbasan (AL) / MKD part, including SS Ohrid	MKD		42.0	Detailed design and permitting	High maturity and financing agreed

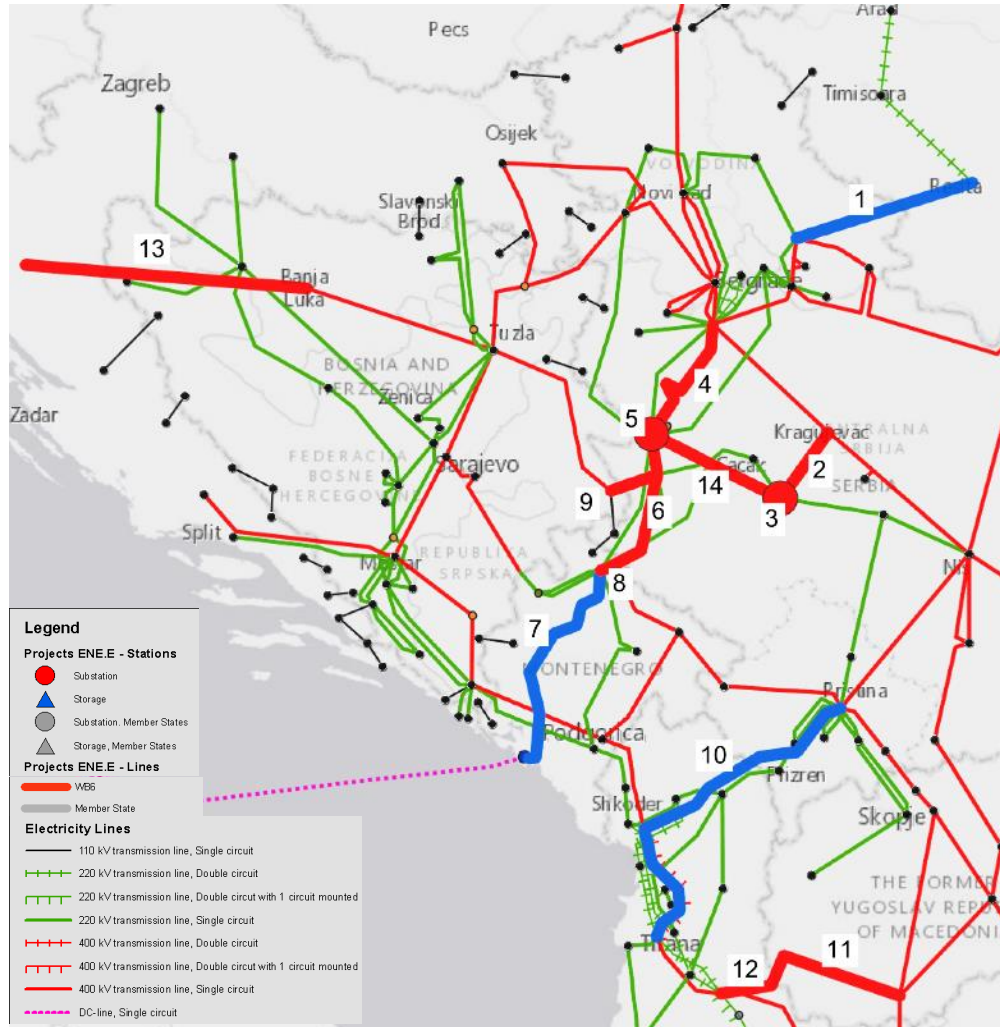
No.	Project name	Country	Corridor	Investment cost (€million)	Present status	Project maturity
12	400kV OHL Bitola (MK) - Elbasan (AL) / ALB part	ALB		33.6	Detailed design to be initiated	High maturity and financing agreed
13	400kV OHL Banja Luka (BA) - Lika (HR) / BIH part	BIH	CSE 1 corridor	34.9	Feasibility study initiated (tendering)	Low maturity
14	400kV OHL Bajina Bašta - Kraljevo (RS)	SER	Trans Balkan Corridor, section in Serbia, phase II	65.0	FS, including ESIA and Preliminary design on-going	Medium maturity (long-term project, 2030)
	Total			328.0		

The status and financing requirements of the fourteen projects reviewed can be summarised as follows:

- 3 projects under construction,
- 5 projects of high maturity, with financing issue already resolved,
- 1 project of low maturity, where Feasibility Study is yet to be started,
- 1 project of medium maturity, where Feasibility Study, including ESIA and Preliminary design, has started but the project is long-term (mature beyond 2020) and
- 4 projects of high maturity, with requirements for co-financing.

In the figure below, all analysed projects are presented in blue (under construction) and red (mid-term) colour. From that figure, it is easy to recognise that the highly mature projects in Serbia and Bosnia and Hercegovina, with requirements for co-financing (projects no. 4, 5, 6 and 9 – see the table), are placed in the central part of the strategically important Trans Balkan corridor, as described here above and are thus a bottleneck for the establishment of this corridor and regional connectivity.

Figure 5.1: Location of electricity interconnection projects



6. Gas

6.1 Gap analysis

6.1.1 Regional connectivity projects

The scoping phase was used to develop a list of Regional Connectivity Projects for gas using the following sources (in chronological order):

- **ECS Peci 2013.** The first common comprehensive assessment of the priority energy infrastructure projects for the SEE region, prepared using technical criteria, project maturity, RES facilitation impact and cost benefit analysis. The first Peci list of projects adopted at the 11th Ministerial Council in October 2013
- **ENTSO-G TYNDP 2015.** The currently valid list of gas transmission network infrastructure development projects nominated and agreed by the TSOs that are members of ENTSO-G. Cross-border transmission infrastructure projects in ENTSO-G TYNDP 2014 are supported by both interconnected TSOs and the list complies with the requirement of Regulation EC 714/2009 to develop and adopt a non-binding Community-wide Ten Year Network Development Plan (TYNDP) every two years.
- **EU PCI 2015.** The latest and currently valid list of gas transmission network infrastructure development projects nominated and agreed at the EU level. According to EU Regulations these lists are developed/updated every two years: first list was developed in 2013, current one in 2015 and following list is due in 2017.
- **ENTSO-G Regional Investment Plan 2015 Continental South East region.** Apart from developing TYNDP, ENTSO-g also develops Gas Regional Investment Plans (GRIP). Central Eastern Europe GRIP 2014-2023 and Southern Corridor GRIP 2014-2023 analyses projects from the WB6 neighbouring countries.
- **Gas to Power study.** The Gas to Power study was supported by a WBIF grant and has the objective to examine approaches to stimulate the development of the regional gas market in South East Europe (SEE), including gas to power projects and gas supply for non-power demand. The last report was produced in 2016.
- **CESEC conditional priority projects.** In order to accelerate the integration of Central- and South-Eastern European gas markets and diversify gas supplies, Austria, Bulgaria, Croatia, Greece, Hungary, Italy, Romania, Slovakia and Slovenia and the EU set up a High-Level Working Group in February 2015. The aim of the group is to coordinate efforts to facilitate cross-border and trans-European projects that diversify gas supplies to the region, as well as to implement harmonised rules.
- **Single pipeline project lists issued by individual WB6 countries.** The single project pipelines have been prepared from by each country as part of the new IPA II process, approved by the National Investment Committees and were submitted in December 2015.

In the scoping report, a total of 39 gas projects were identified based on the comprehensive analysis of various available studies. The study also highlighted the following key features of the gas transmission system in the Western Balkans:

- Gas infrastructure in the region is relatively poorly developed. Only Serbia Bosnia & Herzegovina and the former Yugoslav Republic of Macedonia have some gas infrastructure, while the other three (Montenegro, Kosovo and Albania) have none. Therefore, rather than solely identifying gaps in the narrow sense, the projects evaluated are to enable the gasification of areas and enable the creation of markets for gas.
- Unlike electricity, the development of large gas interstate transmission in the past was usually undertaken by a commercial developer or concessionaire. Therefore, although required by Regulation (EU) 994/2010 concerning measures to safeguard security of gas supply, it is unlikely that gas network will be developed for example for energy security reasons, if the proposed transmission pipeline is not commercially viable.

6.1.2 ECS PECEI 2016 list and projects for study phase

The submission of the EC SEE PECEI 2016 projects closed in February just after the submission of the scoping report. A total of 19 gas projects were submitted and it was agreed with DG NEAR that these should form the basis for the study phase.

At the time of performing this project, PECEI 2016 application were in their “raw” format, as received from the project promoters. These “raw” PECEI applications were further consolidated to combine the double applications by the two concerned TSOs (MER Skopje and GA-MA Skopje) for interconnection pipelines. Further, projects that were applied for by two entities (in the former Yugoslav Republic of Macedonia) were considered as a single project. Also clustered applications (like MKD nomination of interconnection with Albania, Kosovo and Serbia) were broken down and considered as individual interconnections. In addition to that TAP was included in the short list and also possible underground storage in Albania. TESLA project was not evaluated as it is already included in the PECEI list; i.e. its significance is for the larger region than WB6 countries.

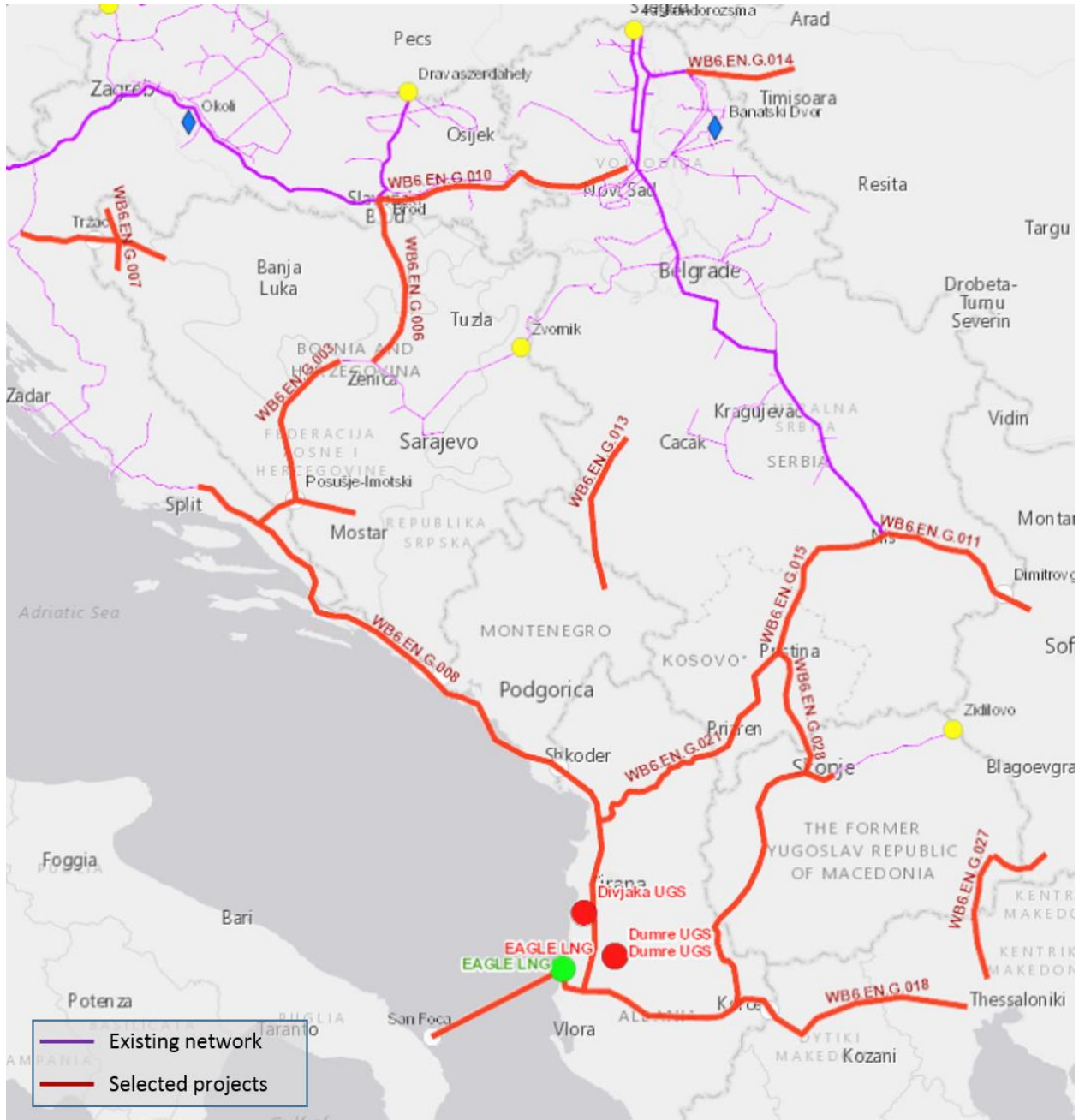
The list of projects is reproduced in Table 6.1 as well as being shown graphically on Figure 6.1.

Table 6.1: Gas projects reviewed during study phase

Project code	Project name	PECEI 2016 code	Comments
WB6.EN.G.001-1	Albania underground storage Dumre A1	Not nominated	Dumre A1 and A2 are alternatives, Feasibility study required to determine which is more feasible.
WB6.EN.G.001-2	Albania underground storage Dumre A2	Not nominated	Dumre A1 and A2 are alternatives, Feasibility study required to determine which is more feasible.
WB6.EN.G.001-3	Albania underground storage Divjaka	Not nominated	Project has been determined as not feasible due to technical reasons.
WB6.EN.G.002	EAGLE LNG and Pipeline	gas_17	Commercially driven project.
WB6.EN.G.003	Interconnection Pipeline BiH - HR (Ploce-Mostar-Sarajevo / Zagvozd-Posusje- Travnik)	gas_03	Further project development is pending the releasing of grant funding for the Feasibility study.
WB6.EN.G.006	Interconnection pipeline BiH-HR (Slobodnica-Brod-Zenica)	gas_01	This project is lacking the political support from all entities in Bosnia&Herzegovina
WB6.EN.G.007	Interconnection Pipeline BiH - HR (Licka	gas_02	Project of local relevance

Project code	Project name	PECI 2016 code	Comments
	Jesenica-Trzac-Bosanska Krupa)		
WB6.EN.G.008	Ionian Adriatic Pipeline (IAP)	gas_16	Funding has been requested for main design and ESIA in WBIF round 15
WB6.EN.G.010	Gas Interconnector Serbia Croatia	gas_10	FS and CBA are the next steps in project development
WB6.EN.G.011	Gas Interconnector Serbia Bulgaria	gas_09	Main design ongoing. Tendering documentation to be developed. Construction start expected in 2019.
WB6.EN.G.012	Interconnector of Republic of the former Yugoslav Republic of Macedonia with Kosovo, Albania and Serbia (MKD - SER part)	gas_05 & gas_11	FS and CBA are the next steps in project development
WB6.EN.G.013	Gas interconnector Serbia - Montenegro	gas_12	More feasible option (via Kosovo/Prishtina) is not supported by Kosovo authorities
WB6.EN.G.014	Interconnector Serbia-Romania	gas_08	Potential further development steps will be determined upon completion of the ongoing pre-feasibility study
WB6.EN.G.015	Gas Interconnector Serbia – Kosovo (Niš - Prishtina)	gas_12	Project lacks political support from Kosovo authorities
WB6.EN.G.018	Trans Adriatic Pipeline (TAP)	Not nominated	Construction is ongoing
WB6.EN.G.020	Interconnector of former Yugoslav Republic of Macedonia with Kosovo, Albania and Serbia (MKD - ALB part)	gas_05 (and gas_06)	FS and CBA are the next steps in project development.
WB6.EN.G.021	Albania - Kosovo Gas Pipeline (ALKOGAP)	gas_13	FS and ESIA funding has been requested at PGAF round 15
WB6.EN.G.026	Interconnector of the former Yugoslav Republic of Macedonia with Bulgaria and Greece (BG - MKD part)	gas_04	FS required to determine the priority interconnection (to Bulgaria or to Greece). No information available on the developments in respective MS
WB6.EN.G.027	Interconnector of the former Yugoslav Republic of Macedonia with Bulgaria and Greece (GR - MKD part)	gas_04	FS required to determine the priority interconnection (to Bulgaria or to Greece). No information available on the developments in respective MS
WB6.EN.G.028	Interconnector of the former Yugoslav Republic of Macedonia with Kosovo, Albania and Serbia (MKD - KOS part)	gas_05	Project lacks political support from Kosovo authorities

Table 6.1: Map of gas projects reviewed during the study phase



6.2 Review of projects

Detailed assessment of the selected projects was conducted through the evaluation of existing documentation (mostly studies performed through previous technical assistance programmes in the region). In addition to that meetings were held with representatives of key institutions in each of WB6 countries followed by a questionnaire to be filled by each of the project promoters. Questionnaires were developed focusing on acquiring the information on the maturity and status of each of the shortlisted projects. A project fiche has been completed for each project and is available in the Annexe to this report or can be viewed on line by accessing the GIS application. The key findings for each project are summarised below.

6.2.1 Albania underground storage Dumre A1/A2

Type:	Underground storage
From/To:	Dumre (ALB)
Components:	Underground gas storage
Capacity:	0,3/1,2 bcm/year
Costs:	€68-73 million
Start:	unknown
End:	unknown

Status:

Dumre A1 and A2 are considered as alternatives. The project prefeasibility study has been concluded. The feasibility study is pending project beneficiary (Albpetrol) decision on funding.

Benefits:

The project can serve as a regional gas storage covering the peak demand and balancing seasonal supply and could help Albania to meet N-1 criterion. An underground gas storage facility at Dumre in Albania would be a part of the SEE gas ring

Financing:

Financing still to be determined subject to successful project development.

Risks:

The project is still in very early stage of development.

Expected development:

The Feasibility study needs to be undertaken. This could possibly to be financed through technical assistance, although there is also commercial interest expressed from TAP in their project presentations.

6.2.2 EAGLE LNG and pipeline

Type:	Floating LNG terminal and pipeline
From/To:	Fier region coast (ALB) to ALB and to ITA
Components:	Floating LNG (FSRU) unit and HP pipelines to Italy and Albania

Capacity: 4 -8 bcm/year
Costs: €300 million for the pipelines (FSRU intended to be chartered)
Start: unknown
End: 2020 (ENTSO-G)

Status:

The project is in the feasibility and early design phase. It is being developed by a private investor. Further development and potential FID will depend largely on commercial, market and financing situation.

Benefits:

The project will bring a second source of gas to Albania and other neighbouring countries if IAP and the Italy interconnection is developed.

Financing:

Financing still to be determined subject to successful project development.

Risks:

The project is still in relatively early stage of development. The main risks are of a commercial nature. With TAP crossing the Adriatic, in today's circumstances it seems difficult to justify the construction of another undersea pipeline to Italy, practically parallel to TAP.

Expected development:

Further development is highly dependable on the commercial, market and financing circumstances.

6.2.3 Interconnection pipeline BiH – HR (Ploče-Mostar-Sarajevo/Zagvozd-Posušje-Travnik)

Type: Interconnection pipeline BiH – HR (south)
From/To: Travnik (or Sarajevo) /Zagvozd (or Ploče)
Components: Option Ploče-Mostar-Sarajevo 149 km (142 in Bosnia and Herzegovina, 7 in Croatia); Option Zagvozd-Posušje-Travnik: 187 total (55+110) in Bosnia and Herzegovina, 22 in Croatia;
Capacity: 4 mcm/day
Costs: €89 million
Start: unknown
End: 2021 (ENTSO-G)

Status:

Project is in the pre-feasibility phase. Further activities by the project promotor (BH Gas) are stopped due to unavailability of EU grant funding for developing project documentation.

Benefits:

This project is of great interest for the development of the natural gas sector in Bosnia and Herzegovina, as its implementation would provide a new route of supply for Bosnia and Herzegovina with gas (south route), with a possibility of diversification of supply sources and increase in security of supply of the existing transportation system of Bosnia and Herzegovina. The construction of this gas pipeline(s) would enable the BiH gas transmission system to connect with the Croatian gas transmission system, and then

with the potential route of the IAP Project. This direction implies the possibility to use the potential LNG terminal in Croatia for the needs of BH Gas Company, which adds additional value to the project.

Financing:

Financing still to be determined subject to successful project development.

Risks:

The project is still in a relatively early stage of development. Currently the main risk for further development is the unavailability of EU grand funding for project documentation development.

Expected development:

Further development (feasibility study) is highly dependable on the availability of grant funding for project documentation, through technical assistance.

6.2.4 Interconnection pipeline BiH – HR (Slobodnica – Brod - Zenica)

Type:	Interconnection pipeline BiH – HR (north)
From/To:	Slobodnica/Zenica
Components:	Total 146 km of pipeline DN700 and DN500 (140 in Bosnia&Herzegovina, 6 in Croatia)
Capacity:	4mcm/day
Costs:	€84 million
Start:	unknown
End:	2023 (ENTSO-G)

Status:

The project is in the pre-feasibility phase. Further activities by the developer (BH Gas) are stopped due to unavailability of EU grant financing for the development of project documentation and also because support for the project from Republic of Srpska (as the interconnection partially crosses the territory of Republic of Srpska) is still pending.

Benefits:

This project is a part of small SEE gas ring - connection Croatia south-BiH-Croatia north. This project is of great interest for the development of the natural gas sector in BiH, as its implementation would provide supply for the north-west part of BiH with gas, with a possibility of diversification of supply sources for BiH and an increase in security of supply in case it was extended to the existing transportation system of BiH.

Financing:

Financing still to be determined subject to successful project development.

Risks:

The project is still in a very early stage of development. Currently the main risk for further development is the unavailability of EU grand funding for project documentation development and lack of political support from all entities in BiH.

Expected development:

Further development (feasibility study) is highly dependable on political support and grant funding for the project documentation, through technical assistance.

6.2.5 Interconnection pipeline BiH – HR (Licka Jesenica – Trzac – Bosanska Krupa)

Type:	Interconnection pipeline BiH – HR (west)
From/To:	Lička Jesenica / Bosanska Krupa
Components:	Total 121,5 km of pipeline DN500 (91,5 in Bosnia&Herzegovina, 30 in Croatia)
Capacity:	2mcm/day
Costs:	€33,2 million (and additional 16 for the Croatia part)
Start:	unknown
End:	2023 (ENTSO-G)

Status:

The project is in the pre-feasibility phase. Further activities by the developer (BH Gas) are stopped due to unavailability of EU grant financing for project documentation.

Benefits:

The pipeline is of local interest and provides a new supply route to the west part of BiH (Unsko-Sanski kanton) which does not have natural gas supply.

Financing:

Financing still to be determined subject to successful project development.

Risks:

The project is still in a very early stage of development. Currently the main risk for further development is the unavailability of EU grand funding for project documentation development.

Expected development:

Further development is highly dependent on grant funding for the project documentation.

6.2.6 Ionian Adriatic Pipeline (IAP)

Type:	Regional pipeline from TAP in Albania, crossing Montenegro, to Croatia
From/To:	Fier (Albania) / Split (Croatia)
Components:	Total 510 km of pipeline DN800 (Albania 168 km, Montenegro 94, Croatia 249), including compressor station
Capacity:	20 mcm/day
Costs:	€288 million (€618 million total IAP including the Croatian section)
Start:	unknown
End:	2021 (ENTSO-G)

Status:

The project is in the feasibility phase. An intergovernmental MoU between Croatia, Montenegro and Albania has been signed. Montenegro (with support from Albania) submitted an application to WBIF Round 15 for IAP main design and ESIA in the amount of €5.000.000. On the Croatian section, the ESIA has been approved, location permits are being issued (sections Split-Ploče issued and section Ploče-

MNE border in the process). In addition, the main design has been developed for the section Split-Ploče (construction permit is in the process).

Benefits:

The Ionian-Adriatic Pipeline Project (IAP) is part of the prospective SEE gas ring, is the most important regional project in the South Eastern Europe and has received the support of the Energy Community and the European Commission. The pipeline will interconnect both the existing and planned gas transmission system of the Republic of Croatia with the Trans Adriatic Pipeline (TAP) or a similar project (Interconnector Turkey – Greece – Italy (ITGI)). The project aims to establish a new supply route for natural gas from the Middle East and Caspian region, northwards along the Adriatic coast. The IAP project however is planned as a bi-directional pipeline, so the possible supply direction could also be north – south, from the strategically planned LNG terminal in Croatia, or other sources. The construction of this transmission pipeline would enable the gasification of Albania and Montenegro, southern Croatia and Bosnia and Herzegovina, providing a diversified and reliable natural gas supply.

Financing:

Financing still to be determined subject to successful project development.

Risks:

The main risks are related to the consistency of support of all governments relevant for IAP (Croatia, Montenegro and Albania) and to the positive commercial and market situation that would keep IAP feasible. It is possible the WB will re-evaluate the commercial aspects of IAP development.

Expected development:

A positive outcome to the ESIA and main design grant application are expected, however it still remains to be determined exactly what would be the scope of documentation development and consequently funds approved.

6.2.7 Gas interconnector Serbia Croatia

Type:	Interconnection pipeline Serbia - Croatia
From/To:	Gospođinci / Slobodnica
Components:	Total 172 km of pipeline (102 km in HR, 70 km in SER) DN800 (HR), DN600 (SER)
Capacity:	20 (5) mcm/day
Costs:	€42 million (and Croatian section €88 million)
Start:	unknown
End:	2022 (ENTSO-G)

Status:

The project is a part of the Croatian TSO, TYNDP and Serbian Energy Strategy (Action plan) and TSO Network Development Plan. Currently the documentation is in the pre-feasibility stage in Serbia. In Croatia, basic design has been completed and ESIA approved.

Benefits:

Slobodnica-Gospođinci is the gas pipeline which will connect the Croatian and Serbian gas transmission systems and provide gas transmission in both directions, with a capacity up to 6 bcm/y. This pipeline

would make possible the transit from the LNG solution in Croatia to Serbia, as well as the potential to operate the gas transmission in the opposite direction from new supplies. It provides the possibility of new gas source for the markets of Serbia, Romania and Bulgaria from the future LNG solution on the island of Krk and other sources. The project would be a part of SEE gas ring.

Financing:

Financing still to be determined subject to successful project development.

Risks:

Regular project development and project implementation risks. No major risks identified at this stage.

Expected development:

Feasibility study and CBA study are next project development steps. These might be eligible for technical assistance funding.

6.2.8 Gas interconnector Serbia - Bulgaria

Type: Interconnection pipeline Serbia - Bulgaria

From/To: Niš/Sofia-Dupnica

Components: Total 170 km of pipeline (SER 108 km, BG 62 km) DN700, DN600

Capacity: 5 mcm/day

Costs: €67 million (and €47 million for BG section)

Start: 2019 (construction start estimate)

End: 2020 (ENTSO-G)

Status:

The project is in the main design stage. It is a part of the Serbian Energy Strategy (Action plan) and TSO Network Development Plan and Bulgarian TSO TYNDP (2015-2017), a priority project in the Bulgarian Energy Strategy 2020 and a part of the SEE gas ring. Initial Memorandum of Understanding between Serbia and Bulgaria has been signed in 2012. Currently a new MoU is under preparation. A common road Map for the project implementation has been prepared and submitted to the European Commission in September 2015.

Benefits:

The project provides a new route of supply to Serbia at the same time as integrating Serbian existing and planned gas storage capacities into the Regional market.

Financing:

Bulgaria has secured financing for its section of the project. Serbia is expecting to secure financing for its section within the IPA pre-accession funds. Risks:

No major risks recognized at this stage..

Expected development:

Future project development includes finishing the design, tendering and implementation. Tendering in Serbia is expected to be according to the FIDIC Red book. Implementation could be eligible for co-financing by 2019 when the start of construction is expected.

6.2.9 Gas interconnector of the former Yugoslav Republic of Macedonia with Serbia

Type: Interconnection pipeline SER- MKD

From/To: Niš/Kumanovo

Components: Total 160 km of pipeline DN320

Capacity: 1,3 mcm/day

Costs: €72 million

Start: unknown

End: 2021 (ENTSO-G)

Status:

The pipeline part of the former Yugoslav Republic of Macedonia gasification strategy and the Serbian Energy Strategy (Action plan) and TSO Network Development Plan. On the former Yugoslav Republic of Macedonia side, the feasibility study and preliminary design are completed. On the Serbian side, the prefeasibility study is in progress. It is to be noted that probably the most feasible route is via Prishtina. The lack of support from Kosovo for interconnections with Serbia and the former Yugoslav Republic of Macedonia places a question mark over the project. A possible alternative route which would directly connect Serbia and the former Yugoslav Republic of Macedonia could be considered.

Benefits:

The project provides a new route of supply to the former Yugoslav Republic of Macedonia, increasing the security of supply, diversifying the routes and sources of supply and implementing the regional gas market. It would form part of the SEE gas ring.

Financing:

Financing still to be determined subject to successful project development.

Risks:

This interconnector is nominated to PECCI 2016 by MER JSC Skopje and by GA-MA JSC Skopje. Based on the meetings in Skopje it is expected that MER will be the future project promoter and end beneficiary of that project, however, a risk exists that the disagreement between MER and GAMA will affect further project development. A significant risk for the optimum route is also the fact that Kosovo does not support the interconnections with Serbia and the former Yugoslav Republic of Macedonia.

Expected development:

Further development of project documentation (feasibility and CBA studies) could be funded through technical assistance programmes in the region.

6.2.10 Gas interconnector Serbia Montenegro

Type:	Interconnection pipeline Serbia Montenegro
From/To:	Užice/ Podgorica
Components:	Total 180 km of pipeline DN500
Capacity:	4 mcm/day
Costs:	€276 million
Start:	unknown
End:	2023 (ENTSO-G)

Status:

The project is in the prefeasibility phase and would provide for the gasification of Montenegro. It is a part of the Montenegro gas masterplan, the Serbian Energy Strategy (Action plan) and the TSO Network Development Plan. The alternative and more viable route is via Prishtina, however that option does not have support from the Kosovo authorities.

Benefits:

The pipeline is of local interest and potentially regional interest (if connected to Montenegro in Podgorica and IAP). The pipeline should enable gas supply for Montenegro and Serbia in case of IAP development.

Financing:

Financing still to be determined subject to successful project development.

Risks:

The route which is politically possible at the moment (Užice – Podgorica) is less feasible than the route via Prishtina.

Expected development:

Considering the circumstances, no significant activities are expected in the near term.

6.2.11 Gas interconnector Serbia Romania

Type:	Interconnection pipeline Serbia Romania
From/To:	Mokrin/Masioc
Components:	Total 76 km of pipeline DN600
Capacity:	4,4 mcm/day
Costs:	€46 million
Start:	unknown
End:	2020 (ENTSO-G)

Status:

The project is in the prefeasibility phase and is part of the Serbian Energy Strategy (Action plan) and TSO Network Development Plan. The Romanian side (Romtransgaz) generally supports the interconnection

idea, however no steps have been undertaken from their side (Romtransgaz indicated unsuccessful cooperation attempts with Srbijagas).

Benefits:

The pipeline is of local interest, increases the security of supply and brings additional diversification of routes and sources of supply. It will also assist implementation of the Regional natural gas market.

Financing:

Financing still to be determined subject to successful project development.

Risks:

No extraordinary risks identified at this stage.

Expected development:

Further steps will be determined upon completion of the prefeasibility study.

6.2.12 Gas interconnector Serbia Kosovo* (Niš – Prishtina)

Type: Interconnection pipeline Serbia Kosovo

From/To: Niš/ Prishtina

Components: Total 114 km of pipeline DN500

Capacity: 4 mcm/day

Costs: €68 million

Start: unknown

End: 2023 (ENTSO-G)

Status:

The project is in the prefeasibility phase. The Kosovo authorities do not support it but it is a part of the Serbian Energy Strategy (Action plan) and the TSO Network Development Plan.

Benefits:

The pipeline is of local interest, would provide a supply of natural gas to Kosovo and enable the gasification of Kosovo, provide a supply route to Albania and Montenegro (alternative and more feasible route to interconnect Serbia and Montenegro) and facilitate diversification of routes and sources of supply. It will also assist implementation of the Regional natural gas market.

Financing:

Financing still to be determined subject to successful project development.

Risks:

The main risks arise from the Kosovo authorities not supporting the project. Therefore, further development is not likely in the near term.

Expected development:

No further activities expected in the short and medium term.

6.2.13 Trans Adriatic pipeline (TAP)

Type:	Interconnection pipeline Greece-Albania-Italy
From/To:	Greece-Albania-Italy
Components:	Total 791 km of pipeline (105 km offshore) DN 1200 (offshore DN900)
Capacity:	30 mcm/day
Costs:	€1500 million
Start:	started
End:	2020 (ENTSO-G)

Status:

The project is under construction – preparatory works including construction of access roads are ongoing. The overall construction permit for the project has been issued, and the issuing of specific construction permits (per sections) is in progress. Delivery of pipes on the construction site has started. TAP is still in negotiation with regard to the final closing of the financing (EBRD mentioned among the potential financing syndicate).

Benefits:

TAP's main objective is to open the Southern Gas Corridor, a key goal of the European Energy Policy, and strengthen the security of supply in the region by contributing to the diversification of the supply routes and sources in the region. By connecting Italy, Albania and Greece TAP will improve the flexibility of the system, thanks to the possibility of reverse flow and to the existence of other gas infrastructures such as gas storage (in Italy) and LNG terminals (in Italy and Greece). Most of all, TAP's physical reverse flow capabilities will contribute to market integration and interoperability.

Financing:

Financing to be closed by TAP consortium.

Risks:

Financial close of the project and regular construction risks: delay and cost overruns.

Expected development:

Construction expected to complete in 2020 followed by commissioning of TAP and gas deliveries starting to customers in Italy.

6.2.14 Interconnector of the former Yugoslav Republic of Macedonia with Albania

Type:	Interconnection pipeline between MKD and ALB
From/To:	MKD Gostivar or Bitola/ ALB-Korce
Components:	Total 140 (Gostivar) or 80 (Bitola) km of pipeline DN400/DN500
Capacity:	4 mcm/day
Costs:	€84 million (for Gostivar route, or €48 million for route from Bitola)
Start:	unknown
End:	2020 (ENTSO-G)

Status:

The former Yugoslav Republic of Macedonia section (MER Skopje) has completed a pre-feasibility study. In Albania the project is considered in the ongoing Gas Master plan and the project has been nominated to PECEI by both GA-MA Skopje and MER Skopje. GA-MA nominated the project from Tetovo via Gostivar to the Albanian border while the section from Tetovo to Gostivar is currently tendered for start of construction by MER Skopje. There is another possible interconnection route towards Albania (from Bitola) and the section from Kumanovo to Štip is expected to start operation in mid-2016 while tenders for the construction of the sections from Štip to Bitola are issued. The financing for these activities is secured via credit line from Deutsche and Erste bank to MER Skopje (backed up by the sovereign guarantee).

Benefits:

The pipeline is a part of the SEE gas ring and should connect the Albanian part of TAP at Korce with the former Yugoslav Republic of Macedonia transmission system in Gostivar (gas system west branch) or Bitola (gas system east branch). It would enable a new gas supply route for the former Yugoslav Republic of Macedonia which is currently supplied only by one source of limited capacity.

Financing:

Financing still to be determined subject to successful project development.

Risks:

The interconnection route still needs to be determined. This interconnector is nominated to PECEI 2016 by MER JSC Skopje and by GA-MA JSC Skopje. Based on the meetings in Skopje it is expected that MER will be the future project promoter and end beneficiary of that project, however, a risk exists that the disagreement between MER and GAMA will affect further project development.

Expected development:

Further project documentation development (feasibility and CBA studies – also to determine optimum route; via Bitola or via Gostivar) could be funded through technical assistance programs in the region.

6.2.15 Interconnector of Albania and Kosovo (ALKOGAP)

Type: Interconnection pipeline between Albania and Kosovo

From/To: ALB-Milot/ KOS-Prishtina

Components: Total 200 km of pipeline DN400/DN500

Capacity: 4 mcm/day

Costs: €120 million

Start: unknown

End: 2022 (ENTSO-G)

Status:

The pipeline is a part of the Albanian gas master plan currently being developed within the WBIF IPF4 project. Grant funding in WBIF round 15 has been requested for the Feasibility study and ESIA for the amount of €1.750.000.

Benefits:

The project establishes the consumption potential of the natural gas at the industry and household sectors in Kosovo. The analysis and recommendations of the potential for connectivity are made in the

regional natural gas network (TAP-IAP) studies. The project enhances the portfolio diversification of the energy sources and security of supply. It will have local (supplying gas to north east of Albania) and country impact securing gas supply to Kosovo.

Financing:

Financing still to be determined subject to successful project development.

Risks:

No extraordinary risks identified at this stage.

Expected development:

Further project documentation development (feasibility and CBA studies) could be funded through technical assistance programs in the region. It is expected that the application for FA&ESIA funding will be approved at least to a certain extent.

6.2.16 Interconnector of the former Yugoslav Republic of Macedonia and Bulgaria

Type:	Interconnection pipeline between MKD and BG
From/To:	MK-Štip/BG Petrić
Components:	Total 93 km of pipeline (52 in MKD, 41 in BG) DN700
Capacity:	4,7 mcm/day
Costs:	€58 million
Start:	unknown
End:	2022

Status:

The main design is completed for the former Yugoslav Republic of Macedonia section. The negotiation process and preparation of Memorandum of Cooperation and understanding with the Bulgarian side is in the process. The pipeline is a part of the former Yugoslav Republic of Macedonia gasification strategy. In Bulgaria, the project is in the conceptual phase.

Benefits:

The pipeline is a part of the SEE ring and it would be the second connection of the former Yugoslav Republic of Macedonia with Bulgaria but closer to Greek border. It would enable the former Yugoslav Republic of Macedonia to be supplied from Greece LNG or TAP and allow access to energy fuel on the territory around Radovis-Bogdanci-Strumica with the possibility of construction of an interconnection with the existing system in Bulgaria near Petrić.

Financing:

Financing still to be determined subject to successful project development.

Risks:

No extraordinary risks identified at this stage but the project is still in the conceptual phase in Bulgaria.

Expected development:

Further activities depending on the activities on the Bulgarian side. Analysis is required as to whether a priority connection is needed to Bulgaria or to Greece. Further activities could be financed through technical assistance programs in the region.

6.2.17 Interconnector of the former Yugoslav Republic of Macedonia and Greece

Type:	Interconnection pipeline between MKD and Greece
From/To:	MKD-Štip/GR
Components:	Total 137 km of pipeline (52 in MKD, 85 in GR) DN700
Capacity:	4,7 mcm/day
Costs:	€86 million
Start:	unknown
End:	2020

Status:

The former Yugoslav Republic of Macedonia section has the pre-feasibility study and main design completed. The negotiation process and preparation of Memorandum of Cooperation and understanding with Greece is ongoing. The pipeline is at the heart of the former Yugoslav Republic of Macedonia gasification strategy. No information available on the developments in the respective Member States.

Benefits:

The pipeline is a part of the SEE ring and would enable a new source of gas supply for the former Yugoslav Republic of Macedonia which is currently supplied from gas only from one source of limited capacity. It would enable the former Yugoslav Republic of Macedonia to be supplied from Greece LNG or TAP and allow gasification of the territory around Radovis-Bogdanci-Strumica-Gevgelija.

Financing:

Financing still to be determined subject to successful project development.

Risks:

No extraordinary risks identified at this stage. No information available on the developments in the respective Member States.

Expected development:

Further activities depending on the status of project maturity in Greece. Analysis required as to whether the priority connection is needed to Bulgaria or to Greece. Further activities could be financed through technical assistance programs in the region.

6.2.18 Interconnector of the former Yugoslav Republic of Macedonia and Kosovo

Type:	Interconnection pipeline between MKD and Kosovo
From/To:	MKD-Skopje/KOS Prishtina
Components:	Total 85 km of pipeline DN400 or DN500
Capacity:	4 mcm/day
Costs:	€51 million
Start:	unknown

End: 2020 (ENTSO-G)

Status:

The project is not supported by the Kosovo authorities. The former Yugoslav Republic of Macedonia section has completed the feasibility study and conceptual design. The pipeline is nominated for PEI by both GA-MA Skopje and MER Skopje and is a part of the former Yugoslav Republic of Macedonia gasification strategy.

Benefits:

The pipeline is of local interest and will have country wide impact by securing gas supply to Kosovo. The pipeline would: establish the consumption potential of the natural gas at the industry and household sectors in Kosovo; enhance the portfolio diversification of the energy sources; increase the security of supply; and diversify routes and sources of supply.

Financing:

Financing still to be determined subject to successful project development.

Risks:

The main risk is the lack of political support for the project from Kosovo authorities.

Expected development:

Considering the political situation, no further activities are expected in the near and medium term.

6.3.1 Interconnections with Member States

In addition to obtaining information from WB6 countries, an effort was made (through e-mails to national TSOs) to obtain the information on the status of interconnection projects on the side from neighbouring MS (Bulgaria, Romania, Greece and Croatia). Unfortunately, at the time of publication of this report very little information had been received as the only official feedback was received from Bulgaria on the interconnection with Serbia.

6.3 Overview

The conclusions that can be drawn from the above detailed review of the PEI 2016 draft list of gas projects are as follows:

- In the majority of cases, the overall level of project maturity is very low (projects are mostly in preparatory, pre-feasibility or feasibility phases).
- As a result of the above, the existing documentation is very scarce, and is mostly limited to studies developed through technical assistance programs in the region.
- Due to the low maturity of the projects, the remaining uncertainties are large (including routing, feasibility of the projects, future development plans, timing).
- Many of the projects are burdened by political issues that can significantly affect the project outcome.

From the list of 19 projects a short list of 10 projects have been identified as promising for further technical assistance in the short term and/or possibly signing co-financing agreements until 2020. These are presented in Table 6.2.

Table 6.2: Gas projects potentially suitable for technical assistance or co-financing

Project name	Country	Present status	Project maturity	Investment (€ million)
1 Albania underground storage Dumre A2	ALB	Pre-feasibility studies	Required feasibility studies would require test bore drillings. TAP indicated their commercial interest in the project.	73
2 Interconnection Pipeline BiH - HR (Ploce-Mostar-Sarajevo / Zagvozd-Posusje-Travnik)	BIH	Pre-feasibility studies	Further project development is pending the approval of grant funding for the Feasibility study. Project completion (ENTSO-G): 2021.	89
3 Ionian Adriatic Pipeline (IAP)	MNE, ALB	Feasibility studies	Funding requested for main design and ESIA at PGAF 15 round. Project completion (ENTSO-G): 2021.	288
4 Gas Interconnector Serbia - Croatia	SER	Pre-feasibility studies	FS and CBA are the next steps in project development. Project completion (ENTSO-G): 2022.	42
5 Gas Interconnector Serbia - Bulgaria	SER	Feasibility and basic design	Main design ongoing. Tendering documentation to be developed (FIDIC red book). Ready for co-financing in 2019. Project completion expected in 2020.	67
6 Interconnector of the former Yugoslav Republic of Macedonia with Kosovo, Albania and Serbia (MKD - SER part)	MKD, SER	Pre-feasibility studies	FS and CBA are the next steps in project development. Project completion (ENTSO-G): 2021.	72
7 Interconnector of the former Yugoslav Republic of Macedonia with Kosovo, Albania and Serbia (MKD - ALB part)	MKD, ALB	Pre-feasibility studies	FS and CBA are the next steps in project development. Project completion (ENTSO-G): 2020.	48
8 Albania - Kosovo Gas Pipeline (ALKOGAP)	ALB, KOS	Pre-feasibility studies	FS and ESIA funding has been requested at PGAF round 15. Project completion (ENTSO-G): 2022.	120
9 Interconnector of the former Yugoslav Republic of Macedonia with Bulgaria and Greece (BG - MKD part)	MKD	Pre-feasibility studies	FS required to determine the priority interconnection (to Bulgaria or to Greece). Project completion (ENTSO-G): 2020.	58
10 Interconnector of the former Yugoslav Republic of Macedonia with Bulgaria and Greece (GR -	MKD	Yes	FS required to determine the priority interconnection (to Bulgaria or to Greece). Project completion (ENTSO-G): 2020.	86

Project name	Country	Present status	Project maturity	Investment (€ million)
MKD part)				
Total				934

The projects listed in the above table are also illustrated graphically on the map in Figure 6.2 overleaf in which the TAP project has been shown in green for clarity. Four, most mature and promising projects are encircled.

Given the appropriate development steps being undertaken in a timely manner, all projects listed in the table above could be ready for the start of construction by 2020. Four projects have been highlighted in red which stand out in terms of development already undertaken through WBIF and their ability to link to existing infrastructure. The most mature of the four is the interconnection Serbia-Bulgaria, which is supported from both Serbia, Bulgaria and the EU. Co-financing from the EU funds for the construction of the Serbian section of the interconnection seems to be the crucial factor for the implementation of the project.

Table 6.2: Gas projects under consideration in the near term



7. Conclusions

7.1 The process

The scoping phase identified the gaps in each of the networks that have the potential for improving the connectivity between countries in the Western Balkans and also with neighbouring member states. During the study phase meetings were held with the NIPACs and EU Delegations in each country and experts have met with the ministries or companies responsible for each potential project to review the existing documentation available. This has allowed the maturity of each project to be assessed and the opportunity for co-financing to be evaluated across all sectors.

7.2 Transport

In the transport sector the gap analysis identified all projects that were needed to provide compliance with the TEN-T standards assuming the Mediterranean, Orient/East -Med, and Rhine/Danube core corridors are extended across the Western Balkans. The compliance ratios for the road and rail networks are summarised in Table 7.1.

Table 7.1: Compliance with TEN-T standards on core corridors

Sector	TEN-T requirement	OEM Corridor		MED Corridor	
		Km	%	Km	%
Roads	Motorway or expressway	1594	27.42	936	34.51
Railways	Electrification	1,602	79.77	689	73.73
Railways	Axle load	1,602	56.59	689	77.36
Railways	Operating speed	1,602	45.06	689	11.61
Railways	Maximum train length	1,602	0.00	689	0.00
Railways	Track gauge	1,602	100.00	689	100.00
Railways	ERTMS (full deployment)	1,602	0.00	689	0.00

Overall the gap analysis identified some 31 projects in the road sector, 23 in the rail sector and 6 for inland waterways. The study of each of these 60 projects has concluded that 8 projects are mature for co-financing in the road sector, 4 in the rail sector and 3 along the Rhine/Danube corridor. The projects judged to be mature for co-financing are summarised in Table 7.2. A geographical summary of the road, rail and inland water ways projects reviewed and their maturity is shown on Figures 7.1, 7.2 and 7.3 respectively.

It is emphasised that the consultants have interpreted how to map the core network to the two road and rail core corridors (OEM and MED) and that neither DG MOVE nor SEETO have

commented on this interpretation. However, some projects that were pre-identified at the Vienna meeting are not on the Core Corridors so defined and this caused confusion with beneficiaries (BiH for Route 2a and the former Yugoslav Republic of Macedonia for Corridor VIII).

Table 7.2: Transport projects mature for co-financing

Project		Country	TEN-T Standard to be met	Investment Cost (€million)	Status
Road					
OEM1	Reconstruction of road section between Ostruznica and Strazevica (Sectors 4 and 5) in Serbia to meet with motorways TEN-T standard	SER	Motorway in good condition	60.0	PFS, FS, PD, ESIA, Spatial Planning are completed, Land property issues are resolved, DD is ongoing
OEM2	Completion of Belgrade bypass, Sector 6: Strazevica-Bubanj Potok	SER	Motorway in good condition	142.8	PFS, FS, ESIA, Spatial Planning are completed, DD, land property issues, construction and other permits are ongoing
OEM7	Reconstruction of the road section Pozega-Belgrade to meet with motorways TEN-T standards	SER	Motorway in good condition	1,098.0	PFS, FS, PD and ESIA are completed, Spatial planning documents are completed, Land property issues, DD, Tender documentation, construction and other permits are ongoing. Section from Obrenovac to Preljina is under construction
OEM 19	Reconstruction of road section from Rankovce to Kriva Palanka	MKD	Motorway in good condition	78.0	PFS, FS, PD, ESIA, DD are completed, Land property issues, Tender Documentation, Construction and other permits are ongoing
OEM 20	Reconstruction of road section from Kriva Palanka to Deve Bair	MKD	Motorway in good condition	3.0	PD is ongoing
MED1	Construction of the motorway section Odzak-Vukosavlje-Podnovlje-Rudanka-Doboj South	BIH	Motorway in good condition	368.7	PFS, FS, PD, ESIA, Spatial Planning, DD are completed, Construction and other permits are ongoing
MED5	Construction of the motorway section Zenica North-Žepče South	BIH	Motorway in good condition	357.0	PFS, FS, PD, ESIA, Spatial Planning are completed, DD, Land property issues, Tender Documentation, Construction and other permits are ongoing

	Project	Country	TEN-T Standard to be met	Investment Cost (€million)	Status
MED 10	Upgrade of Thumane-Vore-Kashar (part of the Adriatic-Ionian Highway)	ALB	Motorway in good condition	96.0	FS and PD are completed, DD is ongoing (completion July 2016)
MED 11	Construction of Tirana bypass (part of the Adriatic-Ionian Highway)	ALB	Motorway in good condition	110.0	FS, PD, ESIA are completed, Spatial Planning, Land property issues, DD, Tender documentation, Construction and other permits are ongoing
Railway					
OEM 8	Reconstruction and modernisation of the railway line Belgrade-Novı Sad - Subotica - border with Hungary (Kelebija)	SER	Operating speed, maximum train length	541.0	PFS, FS, PD, ESIA are completed
OEM 12	Rail Route 4 (Bar - Vbrnica) - Signaling Podgorica and Bridges	MNE	Operating speed, maximum train length	40.0	PFS, FS, PD, ESIA, Spatial Planning are completed, Land property issues are resolved, DD, Construction and other permits are completed, Tender documentation are ongoing
OEM 15	Construction of the railway section Beljakovce – Krıva Palanka – Border with Bulgaria	MKD	Electrification, axle load, operating speed, maximum train length	596.0	PFS, FS, DD, Tender documentation are completed
OEM 1	Overhaul of the railway section Sarajevo-Podlugovi	BIH	Operating speed, maximum train length	22.5	FS is completed, DD is ongoing
Inland waterways					
4	Reconstruction and modernisation of River Port of Brcko (WB.TR.W.03)	BiH		14.4	ESIA and DD are completed, Special planning documents are completed and approved, and Construction and other permits are ongoing.
5	Rehabilitation and improvement of the Sava river waterway (WB.TR.W.04)	BiH		21.0	PFS, FS and PD are completed, ESIA is ongoing
6	Demining of the Sava River right bank from the confluence of Drina river of the confluence of Una river (WB.TR.W.05)	BiH		8.0	DD is completed

Figure 7.1: Road projects reviewed and their maturity

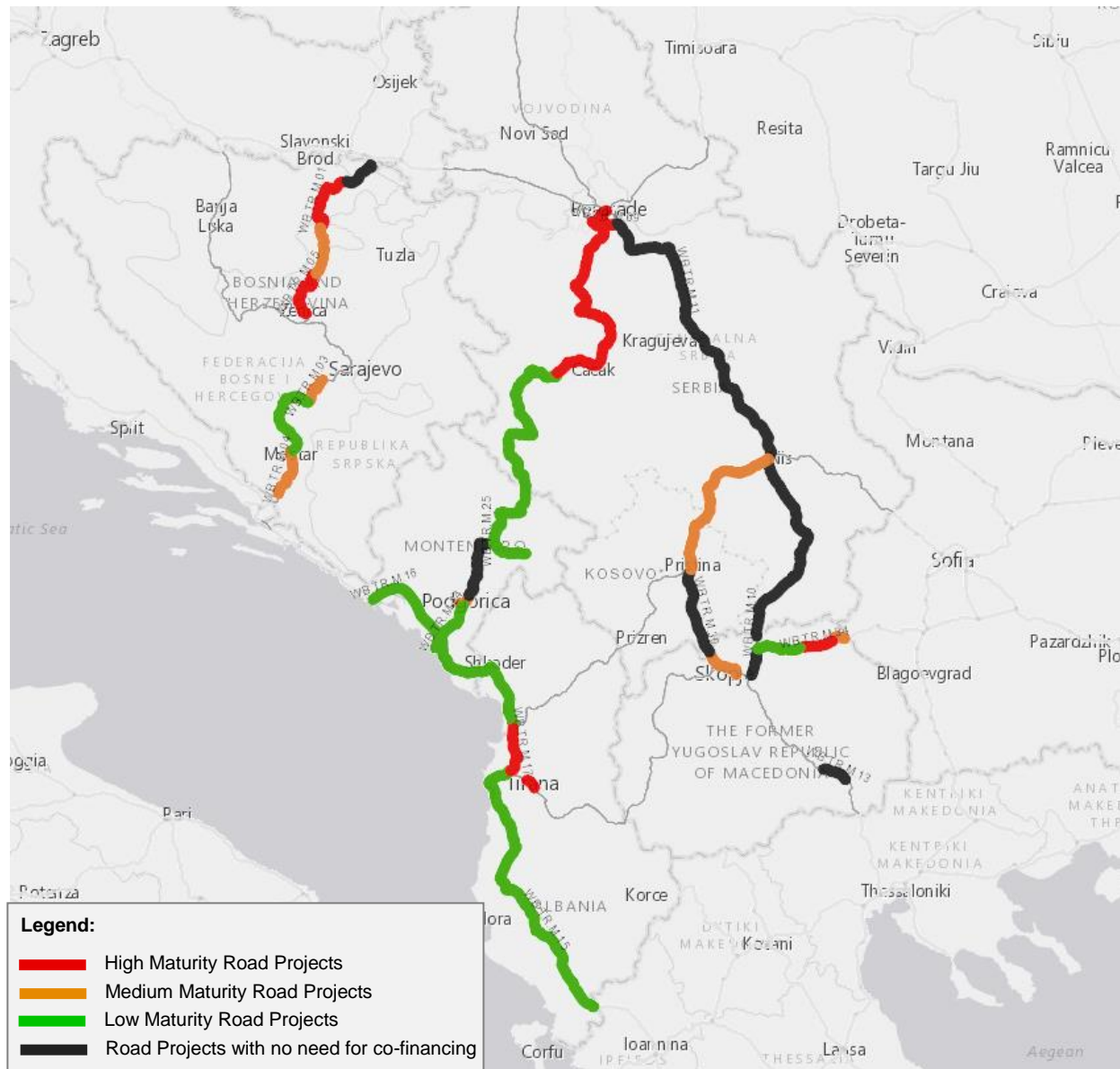
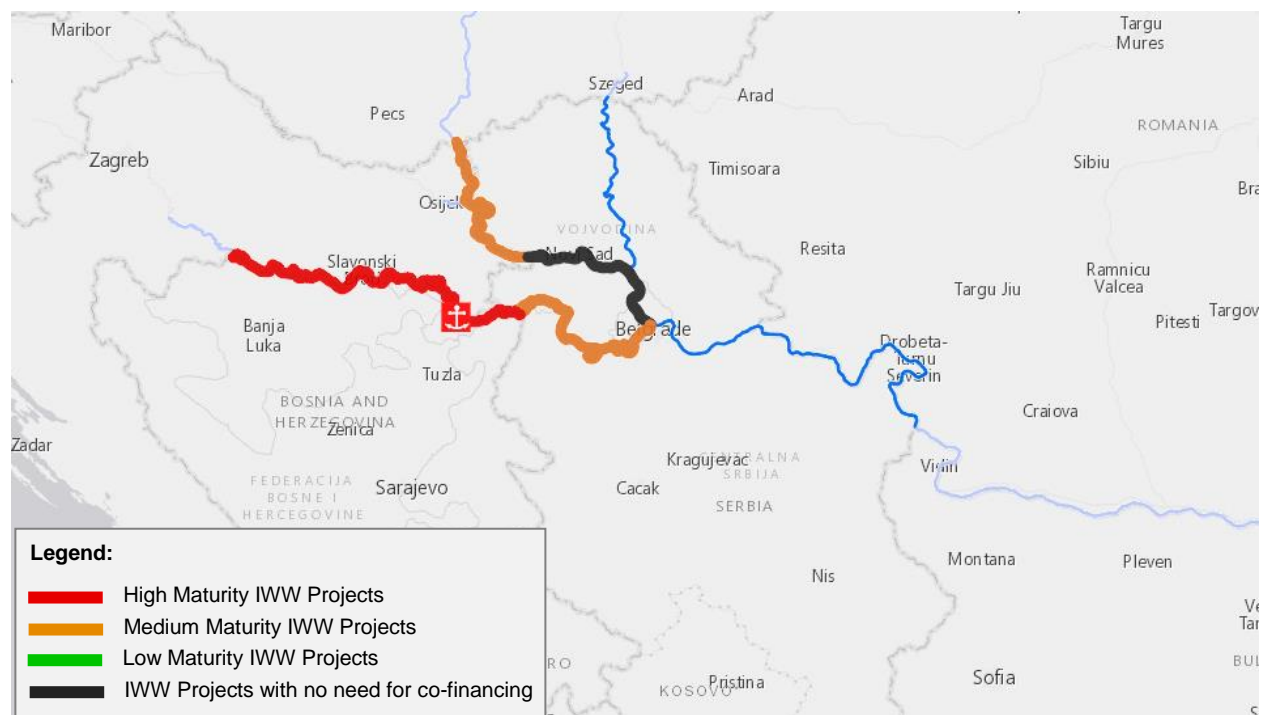


Figure 7.2: Rail projects reviewed and their maturity



Figure 7.3: Inland waterways projects reviewed and their maturity



7.3 Energy

A gap analysis using all available sources of information was undertaken but eventually it was agreed to use only those projects which had been submitted by TSOs for consideration under the ECS PECCI 2016 process. This resulted in 14 electricity projects and 19 gas projects being reviewed in detail during the study phase. The studies have established that 4 electricity projects and 0 gas projects are mature for co-financing, and these are presented in Table 7.3 overleaf.

Table 7.3: Energy projects identified with high maturity

No.	Project name	Country	Corridor	Investment cost (mil.€)	Present status	Project maturity
4	400kV OHL Bajina Bašta - Obrenovac (RS)	SER	Trans Balkan Corridor (section in Serbia), Phase I	51.6	Preliminary design / EIA finalisation and spatial planning	High maturity
5	Upgrade of the existing 220/110kV SS Bajina Bašta to 400kV	SER		11.2	Preliminary design / EIA finalisation and spatial planning	High maturity
6	400kV OHL Bajina Bašta (RS) - Višegrad (BA) - Pljevlja (ME) / SER part	SER		47.1	Spatial planning and Detailed design to be initiated	High maturity
9	400kV OHL Bajina Bašta (RS) - Višegrad (BA) - Pljevlja (ME) / BIH part	BIH	Trans Balkan Corridor, section in BiH	8.0	Preliminary design / EIA finalisation	High maturity

7.4 Next steps

The report was presented to DG NEAR on 7 June in Brussels and the comments received have been integrated into this final version. The team is available for any further assistance that might be required by DG NEAR in preparation for the meetings in Paris on 4 July